

Review Article

Effect of comprehensive nursing on postoperative complications of patients with senile hip fracture

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Abstract: To explore the effect of comprehensive nursing on postoperative complications of senile hip fracture. A total of 263 patients who underwent hip fracture surgery in The Third Hospital of Hebei Medical University were collected as research subjects. Of which, 136 patients were given comprehensive nursing in the observation group (OG). The remaining 127 patients were given routine nursing as the control group (CG). The occurrence of surgical complications and adverse emotions were observed in the two groups. Before nursing intervention, there were no significant differences in all of the indicators between the two groups ($P>0.05$). After nursing intervention, the scores showed that Harris hip joint function score, Barthel index and FIM functional independence measure in the two groups were significantly higher than those before intervention ($P<0.05$). However, the Harris hip joint function score, Barthel index and FIM functional independence measure in the OG were significantly higher than those in the CG ($P<0.05$). After nursing intervention, the scores of self-rating anxiety scale (SAS) and self-rating depression scale (SDS) in the OG were significantly lower than those in the CG ($P<0.05$). The overall incidence of complications in the OG was 5.89%, while that in the CG was 14.95%, which was significantly higher in CG ($P<0.05$). After nursing intervention, QLQ-C30 quality of life score of patients in the OG was significantly higher than that in the CG ($P<0.05$) and nursing satisfaction in the OG was higher than that in the CG ($P<0.05$). Comprehensive nursing intervention can significantly improve the quality of life, psychological state and postoperative complications of senile hip fracture patients after surgery. It is worthy of promotion and application in clinical practice.

Keywords: Comprehensive nursing, senile hip fracture, complication, quality of life

Introduction

The occurrence of hip fracture will lead to life-long disability and death of individuals. Patients with hip fracture have a higher risk of relapse, which has caused a certain burden to families and an increasingly serious public health problem. Therefore, senile hip fracture has received worldwide attention [1]. According to statistics, there are about 1.66 million new hip fracture cases worldwide, and the elderly population with hip fracture was about 841 million in 2013 [1]. As the population of the western world grows older, the burden of hip fracture is expected to increase significantly in the next several decades [2]. Surgery is the main treatment method for hip fracture [3]. But after surgery, complications often occur. In the treatment process, negative emotions such as anxiety and depression often develop to varying degrees, seriously affecting the functional

recovery and quality of life of patients [4, 5]. Therefore, it has high clinical value to find a reasonable nursing intervention mode for hip fracture surgery.

With the rapid development of today's society and the improvement of people's quality of life, the requirements of nursing mode are becoming more and more clear and strict. Conventional nursing intervention can no longer meet the requirements of contemporary clinical treatment. Therefore, it is extremely important to find a nursing mode that can improve treatment to the greatest extent [6, 7]. At present, there are many reports about nursing modes in hip fracture. Comprehensive nursing intervention is a comprehensive model with advanced and high-level nursing concepts. It can strengthen the communication between doctors and patients, reduce the development of patients' emotions, make the medical relationship more

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friendly and help patients develop good living habits during the treatment process; thus providing better quality nursing care for patients [8, 9]. Previous studies have found that comprehensive nursing intervention has better application value in the treatment of patients with cardiac valve insufficiency and it can effectively improve the treatment effect [10]. However, there is no research on the application of comprehensive nursing in senile hip fracture surgery.

This study was mainly designed to compare the different intervention effects of comprehensive nursing and routine nursing modes from various aspects, and explore the application value of comprehensive nursing intervention in the elderly with hip fracture surgery by observing the complications, adverse emotions and multiple quality scores of patients in the process of hip fracture surgery. The purpose of this study was to provide a new nursing intervention model for fracture surgery in the future.

Methods

Baseline data

In total, 263 patients who underwent hip fracture surgery in The Third Hospital of Hebei Medical University were collected as research subjects. There were 136 patients given comprehensive nursing as the OG. There were 71 males and 65 females (61.18±7.28 years old). Another 127 patients were given routine nursing as the CG. There were 66 males and 61 females (61.09±7.19 years old). This study was approved by the Ethics Committee of The Third Hospital of Hebei Medical University and gave a detailed description of the subjects' experimental contents. The subjects agreed and signed an informed consent form.

Inclusion criteria: All subjects were diagnosed with hip fracture after CT and X-ray examination and received an operation as treatment. All subjects were conscious and could communicate normally with each other. All subjects could actively cooperate with the treatments.

Exclusion criteria: After examination, any patients found to have severe organ diseases and liver and kidney dysfunction. In the past, patients with pathological fractures of lower limbs or hips who have received surgical treatment were excluded. Patients with hematologic

diseases and autoimmune system defects were excluded.

Nursing methods

CG: Conventional nursing intervention was adopted for patients. During the period of hospitalization, medical staff pay close attention to the vital sign changes of patients, concern about the patient's psychological state, conduct counseling on the patient's anxiety, depression and other emotions, instruct the patient to reasonably arrange rest and sleep time and create a quiet and comfortable environment.

OG: Psychological nursing: The medical staff communicate relevant knowledge, construct a good psychological intervention system and establish a good relationship with the patients' families. Medical staff communicate with patients, evaluate their psychological state according to their personalities, educational backgrounds and other aspects, patiently and gently answered patients' questions, conduct psychological counseling on patients according to the situation and relieve patients' anxiety, depression and other emotions. If necessary, psychologists can be invited to participate in the intervention to improve the psychological adaptability of patients. Dietary nursing: According to the living habits and personal constitution of patients, medical staff formulate a reasonable and healthy diet plan, encourage patients to eat more foods rich in vitamins, high protein, high calcium and crude fiber and eat less foods containing sugar and fat. Rehabilitation exercise: On the day after surgery, the patient was assisted to carry out dorsiflexion and flexor activities of the limb ankle joint on the bed after the lower limb sensation was recovered. According to the patient's situation, the patient was assisted to carry out gluteal muscle strength and quadriceps femoris exercises to enable venous blood to flow back. The patient was assisted to carry out flexion and extension exercises in ankle joint and hip joint, guiding the heel of the affected limb to slowly slide to the hip under the supine position. Medical staff guided patients from passive to active and gradually expanded the angle. After the operation for 2 weeks, the patient is helped to carry out standing position training. The patient got out of bed and stood for 5 minutes with the walk aid instrument before the end of the procedure. Then, the standing time is grad-

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Table 1. Baseline clinical data in both groups ($\bar{x} \pm sd$)/[n (%)]

	OG (n=136)	CG (n=127)	χ^2/t	P
Gender			0.001	0.969
Male	71 (52.21)	66 (51.97)		
Female	65 (47.79)	61 (48.03)		
Average age/year(s) old	61.18±7.28	61.09±7.19	0.101	0.920
BMI (kg/m ²)	23.11±4.19	23.57±4.24	0.885	0.377
Smoking			0.000	0.976
Yes	42 (30.88)	39 (30.71)		
No	94 (69.12)	88 (69.29)		
Drinking or not			0.070	0.791
Yes	46 (33.82)	41 (32.28)		
No	90 (66.18)	86 (67.72)		
Systolic blood pressure	120.17±13.08	121.31±14.50	0.088	0.930
Diastolic blood pressure	76.45±11.57	76.53±11.71	0.056	0.956
Injury cause			0.322	0.851
Fall damage	69 (50.73)	65 (51.18)		
Traffic accident	11 (8.09)	8 (6.30)		
Others	56 (41.18)	54 (42.52)		

ually extended. After the operation for 3 weeks, according to the patient's recovery, the patient was given double crutches to walk, then changed to a single crutch, and then adjusted slowly. Life nursing: Medical staff gives the patient sleep guidance. Patients are encouraged to rest, to ensure the quality of sleep. Medical staff unite the families and friends of the patients to provide support for the patients and create a good atmosphere. The medical staff pay close attention to the patients' physical status and give attention to the change of temperature difference between day and night. Sheets and bedding bag are changed regularly and properly ventilated to ensure a quiet and comfortable environment. Medical staff pay attention to the occurrence of adverse reactions and treat the possible complications as early as possible.

Outcome measures

The joint function recovery of patients in the two groups of patients was statistically analyzed by the Harris hip joint function score (including pain, range of motion, joint function and deformity) [11] and Barthel index (including grooming, dressing, eating, bathing, walking on the ground and another 10 daily living abilities) [12] were applied to evaluate the patient's recovery. The functional independence of patients in the two groups was evaluated by

FIM functional independence measure (including 6 dimensions of sphincter control ability, transfer ability, self-care ability, exercise ability, social cognitive ability and language communication ability, a total of 18 items) [13]. SAS and SDS [14] were used to observe the emotional changes of patients in the two groups before and after the intervention of nursing mode. The more obvious the anxiety and depression symptoms of hip fracture patients were, the higher the score was. The quality of life of patients was measured by QLQ-C30 life scale, and it was evaluated from five aspects of role (RF), body (PF), cognition (CF), emotion (EF), society (SF) [15]. The occurrence of complications

after intervention was observed, and the nursing satisfaction of patients was counted in the two groups.

Statistical treatment

In this study, SPSS20.0 was used to carry out statistical analysis on the collected data. The counting data was expressed by the number of cases/percentage [n (%)]. χ^2 test was used for comparison between the two groups. The measurement data were expressed by mean number \pm standard deviation ($\bar{x} \pm sd$). The comparison between the two groups was conducted by t test. The comparison between the two groups before and after intervention was conducted by repeated measurement analysis of variance. LSD-t test was used for post-mortem analysis. The difference was statistically significant with $P < 0.05$.

Results

Comparison of baseline data between the two groups

The baseline clinical data were counted in the two groups. More details are shown in **Table 1**. There was no significant difference between the OG and CG in gender, average age, body mass index (BMI), drinking and smoking, systolic blood pressure, diastolic blood pressure, and cause of injury, etc. ($P > 0.05$).

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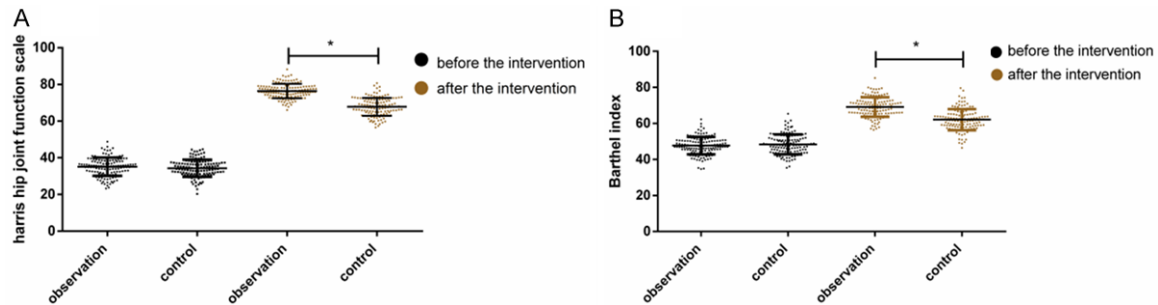


Figure 1. Comparison of Harris hip joint function score and Barthel index in the two groups. A. Harris hip joint function score of patients in the OG was significantly higher than that in the CG ($P<0.05$). B. Barthel index of patients in the OG was significantly higher than that in the CG ($P<0.05$). Note: *indicates a comparison between the two groups, $*P<0.05$.

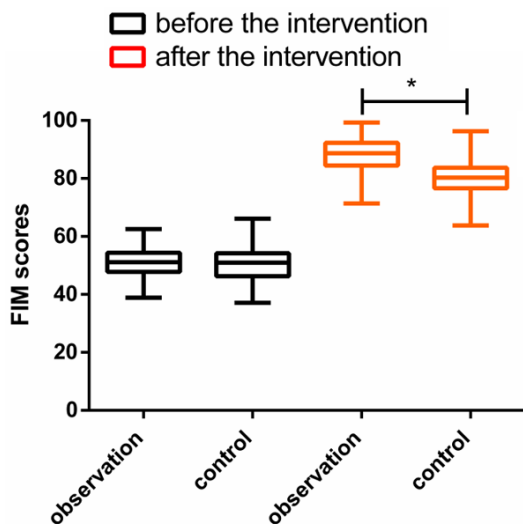


Figure 2. FIM functional independence measures in the two groups. FIM functional independence measures in the two groups were significantly higher after intervention ($P<0.05$), while the FIM functional independence measures in the OG were significantly higher than those of the CG ($P<0.05$). Note: *indicates a comparison between the two groups, $*P<0.05$.

Comparison of Harris hip function score and Barthel index in the two groups

Harris hip joint function score and Barthel index were counted in the two groups. More details are shown in **Figure 1**. Before nursing intervention, there was no significant difference in Harris hip function score and Barthel index in the two groups ($P>0.05$). After nursing intervention, scores of the two groups were calculated and it was found that Harris hip function score and Barthel index in the two groups increased significantly compared with those before inter-

vention ($P<0.05$), while Harris hip joint function score and Barthel index of patients in the OG were significantly higher than those of the CG ($t=15.69, 10.04, P<0.05$).

FIM functional independence measures in the two groups

FIM functional independence measures were counted and compared between the two groups. More details are shown in **Figure 2**. Before nursing intervention, there was no significant difference in FIM functional independence measures between the two groups ($P>0.05$). After nursing intervention, the FIM functional independence measures in the two groups were significantly higher than before intervention ($P<0.05$), while the FIM functional independence measures in the OG were significantly higher than those of the CG ($P<0.05$).

Comparison of SDS and SAS scores in the two groups

Unhealthy emotions were compared in the two groups, as shown in **Figure 3**. There was no significant difference in SDS and SAS scores between the OG and CG before nursing intervention ($P>0.05$). But after different nursing intervention, there was a significant difference between the two groups, in which SDS and SAS scores in the OG are significantly lower than those in the CG ($t=11.79, 14.36, P<0.05$).

Incidence of postoperative complications in the two groups

Postoperative complications of patients were counted in the two groups, as shown in **Table 2**. The overall incidence of complications in the

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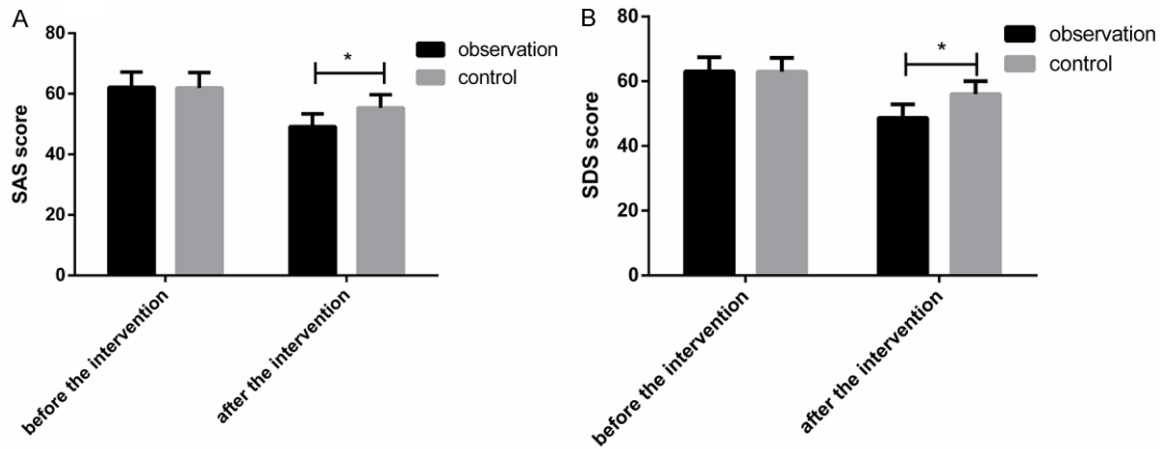


Figure 3. Comparison of SDS and SAS scores in the two groups. A. SDS scores in the OG were significantly lower than those in the CG ($P<0.05$); B. SAS score in the OG was significantly lower than that of the CG ($P<0.05$). Note: *indicates a comparison between the two groups, $*P<0.05$.

Table 2. Complications in the two groups [n (%)]

	Pulmonary infection	Wound infection	Urinary tract infection	Venous thrombosis of low extremities	Bedsore	Muscle atrophy	Overall incidence
OG (n=136)	1 (0.74)	1 (0.74)	2 (1.47)	0 (0.00)	4 (2.94)	0 (0.00)	5.89%
CG (n=127)	2 (1.57)	3 (2.36)	5 (3.94)	2 (1.57)	6 (4.72)	1 (0.79)	14.95%
χ^2							5.875
P							0.015

OG was 5.89%, while that in the CG was 14.95%. The overall incidence of complications in the CG was significantly higher than that in the OG ($P<0.05$).

QLQ-C30 Life Scale Score for in the two groups

The quality of life in the two groups was compared from five aspects: role (RF), body (PF), cognition (CF), emotion (EF) and society (SF). More details are shown in **Figure 4**. There was no significant difference in QLQ-C30 quality of life score between the OG and CG before nursing intervention ($P>0.05$). After intervention, RF, PF, CF, EF and SF scores in the two groups were all higher than before intervention ($P<0.05$). The RF, PF, CF, EF and SF scores of patients in the OG were significantly higher than those in the CG ($P<0.05$).

Nursing satisfaction survey

The nursing satisfaction of patients was collected and investigated in the two groups. There were 85 cases with great satisfaction, 43 cases with satisfaction and 8 cases with dissatisfaction in the OG. There were 66 cases

with great satisfaction, 40 cases with satisfaction and 21 cases with dissatisfaction in the CG. The satisfaction degree in the OG was 94.12%, and that of the CG was 83.46%. The satisfaction degree of the patients in the CG was significantly lower than that of the OG ($\chi^2=5.944$, $P<0.05$), as shown in **Figure 5**.

Discussion

The hip is an important motor center of the human body, which is located at the joint between thigh and trunk. It is mainly responsible for the regulation of the body's independent movement, and can be a site of fracture and strain [16]. The hip fracture is a common type of fracture found clinically, mainly occurring in the elderly. It may be due to the poor response ability and body flexibility of the elderly, as well as osteoporosis, etc. Once the hip is impacted by kinetic energy, it is easily fractured [17, 18]. Some studies have suggested that the development of hip fracture will cause loss of joint function, and it is easy to cause trauma to blood vessels, peripheral nerves, and muscles, which can induce various complications and seriously

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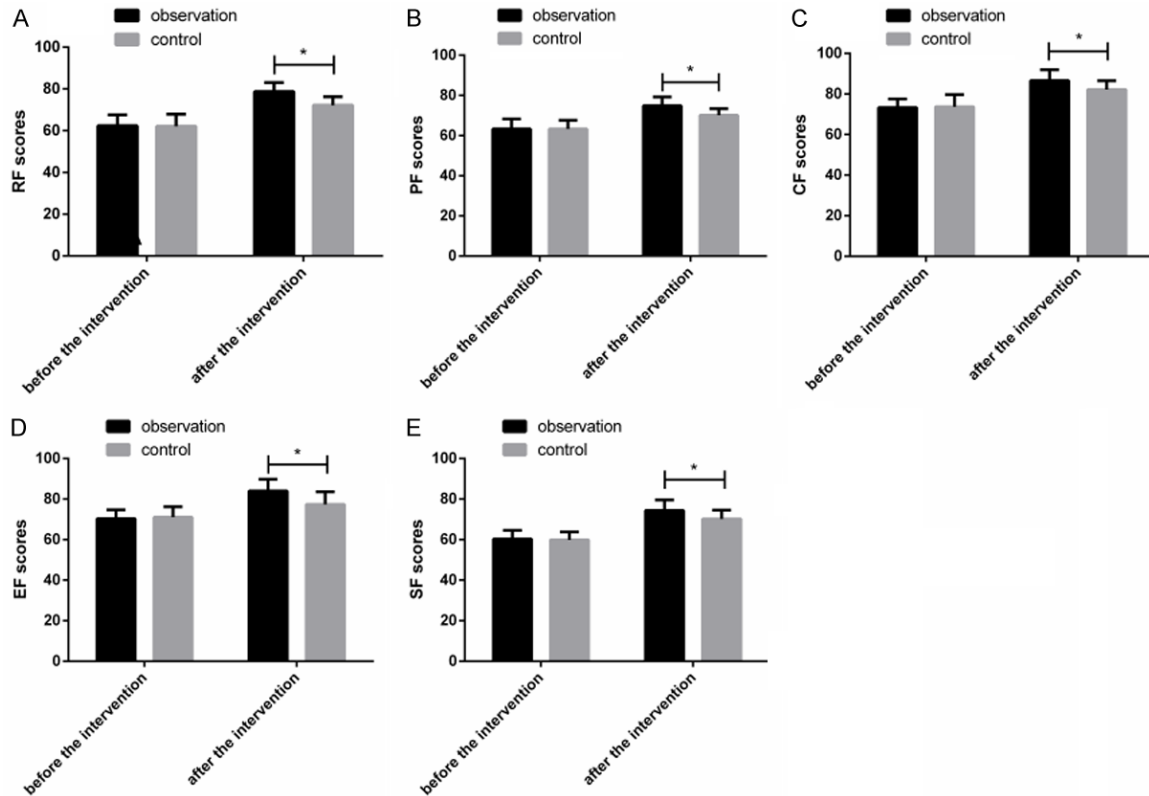


Figure 4. QLQ-C30 Life Scale Score for in the two groups. A. After the intervention, the RF score of patients in the OG was significantly higher than that in the CG ($P < 0.05$). B. After the intervention, the PF score of patients in the OG was significantly higher than that in the CG ($P < 0.05$). C. After the intervention, the CF score of patients in the OG was significantly higher than that in the CG ($P < 0.05$). D. After the intervention, the EF score of patients in the OG was significantly higher than that in the CG ($P < 0.05$). E. After the intervention, the SF score of patients in the OG was significantly higher than that in the CG ($P < 0.05$). Note: *indicates a comparison between the two groups, $*P < 0.05$.

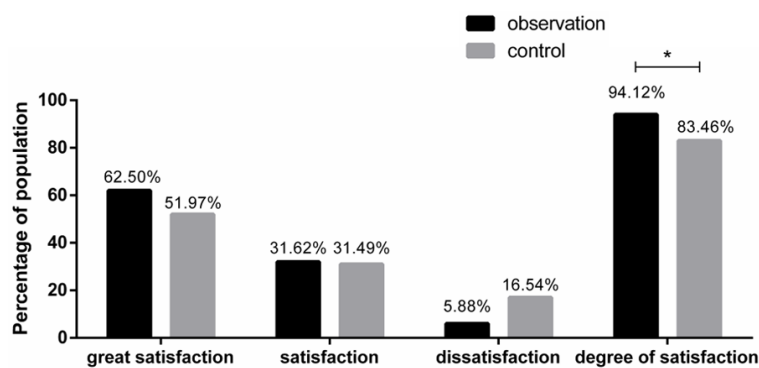


Figure 5. Nursing satisfaction survey. The satisfaction degree in the OG was 94.12%, and that of the CG was 83.46%. The satisfaction degree of the patients in the CG was significantly lower than that of the OG ($P < 0.05$).

addition, it is easy to cause muscular atrophy, malformation and other phenomena, which affect the healing time of fracture and can lead to death in severe cases [20]. The application of nursing is essential in surgical treatment. Strengthening the surgical nursing of elderly patients is conducive to the recovery of joint function and improvement of quality of life, which has an important value in reducing the occurrence of complications [21].

threaten the life and health of patients [19]. At present, surgical treatment is the main treatment method. However, due to long-term bed rest after surgery and poor resistance of the elderly, it often leads to bedsores, infection, thrombosis and other adverse conditions. In

The Harris hip joint function score is applicable to the evaluation of various hip joint treatment effects. The Barthel index is the main examination index for patients' functional state evaluation, and its results have good credibility and effectiveness [11, 12, 22]. In this study, there

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was no difference in scoring between the two groups before intervention. After nursing intervention, Harris hip joint function score and Barthel index in the two groups were improved, while Harris hip joint function score and Barthel index score were higher after comprehensive nursing. Previous studies have found that the Harris hip function score can be significantly improved by nursing intervention after total hip replacement hip joint surgery [23]. Combined with this study, it showed that nursing intervention has important value in functional recovery of hip fracture patients after operation. The recovery of a hip fracture is a long process because the middle-aged and the elderly are special people. Rehabilitation training within 3 months after operation is very important for patients. The application guidance of comprehensive nursing mode ensures that patients adhere to effective functional training and promote the recovery of limb function. At the same time, it also ensures that patients can solve some difficulties encountered in training at any time and plays a role in supervising the whole training. Therefore, Harris hip function score and Barthel index scores are better after comprehensive nursing intervention than conventional nursing. Heyman [24] et al. found that in elderly patients with hip fracture, if accompanied by certain delirium emotions, their FIM functional independence measure are at a lower level. In this study, FIM functional independence measure showed no difference between the two groups before the intervention. After the intervention, the score in the two groups increased, and the score of the OG was significantly higher than that of the CG ($P < 0.05$). The results suggested that nursing intervention can improve FIM functional independence measures, but a more comprehensive nursing mode is better.

Due to the gradual decline of coping ability and psychological defense ability in the elderly population with the increase of age, they are prone to mood fluctuations [25]. At present, literature shows that depression is more common in patients after hip fracture surgery, and this emotion will seriously affect the functional recovery of patients and prolong the recovery period [26]. However, this study suggested that nursing intervention has certain effects in relieving the patients' emotions. However, comprehensive nursing gives patients counseling from the psychological level of patients accord-

ing to their different personalities and educational backgrounds. After comprehensive nursing intervention, SDS and SAS scores of patients with hip fracture after surgery were significantly reduced, and its effect was better than that of conventional nursing. At present, there is literature showing that emotions have an impact on patients after hip fracture surgery [27]. However, the occurrence of emotions often causes patients to lose confidence in treatment, form negative attitudes, which seriously affect patients' treatment compliance, and easily leads to a variety of complications, seriously endangering lives and affecting patients' satisfaction with treatment and nursing [21]. However, this study found that after intervention of different nursing modes, there were certain differences in complications. The incidence of complications in comprehensive nursing was significantly lower than that in conventional nursing. This may be due to the effect of comprehensive nursing in improving anxiety and depression of patients. Comprehensive nursing pays attention to the clinical signs of patients before development of complications. Once abnormal situations occur, certain measures are taken in time and reported to doctors to ensure reasonable and timely treatment. In this study, QLQ-C30 score was used to evaluate the quality of life of patients. The results showed that the scores of RF, PF, CF, EF and SF assisted by comprehensive nursing mode were higher than those of the conventional control group, which could effectively improve the living standard of patients and improve the prognosis. Tseng [28] et al. compared the application of interdisciplinary nursing, comprehensive nursing and routine nursing in hip fracture patients. It was found that comprehensive nursing has better application effect in improving health-related quality of life (HRQoL) score. The nursing satisfaction of patients was collected and investigated in the two groups. The results showed that the patients' satisfaction was better after comprehensive nursing intervention. This indicated that the application of comprehensive nursing to patients after hip fracture surgery can effectively alleviate the nursing relationship, reduce the occurrence of risk events such as disputes and complaints of nursing staff, improve the doctor-patient relationship, bring better medical experience to patients and help patients resist diseases more comfortably and cooperatively.

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In this study, we comprehensively discussed the application effect of comprehensive nursing in the postoperative recovery of hip fracture, but there are still some limitations. The prognosis of the patients was not followed up for a long time. There are many influencing factors that affect the recovery of elderly patients. In future research, the effect of different hospital environments on the recovery of fracture patients can also be specifically analyzed to better improve the poor prognosis of patients.

To sum up, comprehensive nursing can significantly improve the complications and emotions of elderly hip fracture patients, and has a high application value.

Disclosure of conflict of interest

None.

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