DOI: 10.53469/jcmp.2025.07(11).45

The Influence of Hospital-community-family Collaborative Rehabilitation Nursing on Elderly Hip Replacement Patients

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Abstract: ***Objective**: To investigate the impact of hospital-community-family collaborative rehabilitation nursing on elderly hip replacement patients. **Methods**: A total of 142 elderly hip replacement patients admitted to our hospital were randomly divided into two groups (control group and study group) between March 2022 and March 2024. The control group received conventional nursing intervention, while the study group underwent hospital-community-family collaborative rehabilitation nursing. **Results**: The study group demonstrated higher hip function scores (P<0.05), lower postoperative rehabilitation complication rates (P<0.05), and better rehabilitation compliance (P<0.05). **Conclusion**: When traditional rehabilitation approaches for elderly hip replacement patients fail to meet clinical intervention needs, the hospital-community-family collaborative rehabilitation nursing model effectively improves hip function scores, significantly reduces postoperative complications, promotes gradual recovery of daily living abilities, and enhances patient engagement in nursing interventions through comprehensive health education and appropriate rehabilitation training.*

1. Introduction

With the deepening of population aging, there has been a significant increase in patients suffering from basic diseases such as arthritis. This condition is primarily caused by individual bone loss, weakened shock resistance, and impaired coordination functions in patients [1]. If left untreated, it poses a serious threat to patients 'health and safety. Currently, artificial hip joint replacement surgery is generally prioritized as the primary treatment method, which significantly reduces hip pain and corrects joint deformities through reconstructing hip joint function [2]. Numerous international experts believe that hospital-community-family collaborative rehabilitation care has gained widespread recognition among medical professionals and is widely applied across various medical departments. This rehabilitation intervention formulates targeted community - assisted medical plans based on elderly hip replacement patients' recovery progress, thereby reducing the rate of hip joint functional re-injury. The Canadian Best Practice Recommendations for Hip Replacement also emphasize the necessity of community support for elderly hip replacement patients. Therefore, establishing a comprehensive, systematic, and continuous medical care system can help elderly hip replacement patients smoothly transition to community and home rehabilitation stages, improving their prognosis. Research data indicates that domestic studies on hospital-community-family collaborative rehabilitation care remain in their infancy, with incomplete clarification of specific current status and establishment of a complete system. With the growing emphasis on health preservation among Chinese citizens, rehabilitation medical services have expanded from hospitals to communities and households, now widely applied in rehabilitation care for various diseases and chronic disease management/treatment for elderly patients. The hospital-community-family collaborative nursing intervention, as a systematic model, ensures continuous and comprehensive care for patients both during hospitalization and post-discharge, further improving prognosis outcomes for elderly hip replacement patients [3]. This study analyzes the specific impacts of implementing the hospital-community-family collaborative rehabilitation nursing model during elderly hip replacement interventions, with findings presented as follows.

1.1 Design and Participants

General Information A total of 142 elderly patients undergoing hip replacement surgery at our hospital were selected as subjects, with the study period spanning March 2022 to March 2024. Patients were randomly divided into two groups using a randomized number table method: Group 1 (71 cases) comprised 41 males and 30 females, aged 32-92 years with an average age of (62.0±1.7) years. Group 2 (71 cases) included 42 males and 29 females, with an average age of (62.5±1.6) years. All patients demonstrated comparable baseline data (P>0.05).

1.2 Control Group – Standard Preceptorship

Routine nursing intervention. The nursing content is as follows: nurses provide patients with routine health education intervention, explain the postoperative matters and methods of participating in training activities to patients in detail; at the same time, record patients 'vital signs in real time, and adjust the guidance plan according to patients' postoperative rehabilitation.

1.3 Intervention Group: Hospital - community - family Collaborative Rehabilitation Nursing Intervention.

The nursing protocol comprises three phases: (1) Hospital Phase. Collects patients 'personal information, contact details, and attending physician records, while conducting safety assessments of rehabilitation equipment in the patient's community-based rehabilitation center to determine suitability for subsequent exercises. Qualified cases are documented in the partner hospital's database. A WeChat

group facilitates tripartite communication between hospital, community, and families. Weekly updates from specialized nurses cover dietary management, daily routines, and exercise regimens. Nurses provide tailored rehabilitation guidance, adjusting care plans based on individual recovery progress and sharing real-time updates with the community. (2) Community Phase. First week post-surgery: Community therapists guide patients in low-intensity exercises like ankle pumps and hip lifts. Second week: Patients gradually elevate their affected leg to 45° while maintaining a semi-recumbent position for 30 minutes. Third week: Conducts 10-second four-point support half-bridge exercises (15 reps per set), incorporating progressive walking training. Fourth week to three months: Gradually increases weight-bearing exercises according to individual needs, adjusting normal versus assisted walking protocols. Post-recovery rehabilitation information is shared with both hospital and family members to ensure coordinated care. (3) Home Phase. Family caregivers should provide patients with comfort, encouragement, and attentive care to motivate their active participation in rehabilitation exercises. It's essential to maintain a balanced diet rich in calcium while ensuring adequate daily sunlight exposure for 30 minutes to boost vitamin D levels and prevent osteoporosis. Gradually guide patients to get 8 hours of sleep nightly and regularly disinfect the living environment. Caregivers must also regularly update healthcare providers and community health centers on the patient's recovery progress, enabling real-time monitoring of their healing process.

2. Outcome Measures

2.1 Hip Joint Function Score

At discharge and 3 months after discharge, the hip joint function was evaluated with Harris scoring scale, including pain, function and deformity, and joint mobility. The full score was 100 points, and the higher the score was, the better the function was [4].

2.2 Daily Living Ability Score

At discharge and 3-month follow-up, patients 'daily living abilities were assessed using the Barthel Index of Activities of Daily Living (BIA-100), where higher scores indicate better functional performance. In a similar study involving 386 heart failure patients, the scale demonstrated excellent reliability with a Cronbach's α-correlation coefficient of 0.909 [5].

2.3 Rehabilitation Compliance

At discharge and 3 months post-discharge, patients' rehabilitation compliance was assessed using a scale divided into three categories: full compliance (strict adherence with active cooperation), partial compliance (barely completed under guidance from nurses and family members), and non-compliance (strong rejection and refusal). The total compliance rate was calculated as the sum of full and partial compliance rates [6-7].

2.4 Postoperative Rehabilitation Complications

The number of postoperative rehabilitation complications occurred during the three-month recovery period in patients undergoing comparative exercise.

2.5 Statistical Methods

Data were analyzed using SPSS 22.0. Quantitative data were presented as mean ± standard deviation (). Data meeting normal distribution were analyzed using t-tests: independent samples t-test for inter-group comparisons and paired samples t-test for intra-group comparisons. Non-normal distributed data were analyzed using non-parametric tests. Categorical data were evaluated using the chi-square test (χ^2, %). Statistical significance was defined as $P<0.05$ for differences, $P<0.01$ for significant differences, and $P>0.05$ for no statistical significance.

2.6 Results

The hip joint function score and daily living ability score of the intervention group were higher ($P<0.05$), as shown in Table 1.

The incidence of postoperative rehabilitation complications was lower in the intervention group ($P<0.05$), as shown in Table 2.

The intervention group had higher recovery compliance ($P<0.05$), as shown in Table 3.

Table 1: Hip joint function score and daily living ability score (score, $\bar{x} \pm s$)

Group	Number	Hip joint function score		Daily living ability score	
		One month after discharge	Three months after discharge	One month after discharge	Three months after discharge
Control Group	71	63.8±8.6	71.0±6.8	63.6±5.6	76.4±6.7
Intervention Group	71	74.5±7.5	91.6±7.7	75.8±8.0	90.7±8.6
T-values	/	11.112	14.560	11.298	11.478
P-values	/	＜0.05	＜0.05	＜0.05	＜0.05

Table 2: Postoperative rehabilitation complications (case,%)

Group	Number	Abarticulation	Deep vein thrombosis	Urinary tract infections	Pulmonary infection
Control Group	71	6(8.5)	8(11.3)	6(8.5)	6(8.5)
Intervention Group	71	2(2.8)	0(0.0)	0(0.0)	0(0.0)
X^2-values	/	4.450	4.876	4.600	4.600
P-values	/	＜0.05	＜0.05	＜0.05	＜0.05

Table 3: Rehabilitation compliance (case.,%)

Group	Number	Full compliance	Part compliance	Non-compliance	Overall compliance rate
Control Group	71	26	25	20	71.8%
Intervention Group	71	40	29	2	97.2%
X2-values	/	5.432	4.409	5.870	4.987
P-values	/	＜0.05	＜0.05	＜0.05	＜0.05

3. Discussion

Hip arthroplasty involves implanting a prosthetic device at the original joint site. The postoperative recovery of hip joint function serves as a key indicator of surgical outcomes [8-9]. However, due to prolonged recovery periods and age-related functional decline in elderly patients, current rehabilitation effectiveness often fails to meet clinical requirements. This necessitates the implementation of well-designed nursing interventions [10-11].

The hospital-community-family collaborative rehabilitation model, as a novel clinical nursing approach, has demonstrated positive effects on elderly hip replacement patients 'recovery [12]. The study group exhibited higher hip function scores and daily living ability scores, with significantly lower postoperative rehabilitation complication rates. Scholar Hua Cuihe [13] conducted a similar study showing that the intervention group's 24 patients showed slightly higher hip function and daily living ability scores, but no significant change in postoperative complications. However, the latter study lacked scientific validity due to insufficient sample size, further validating the model's effectiveness in improving hip function and self-care abilities. This is primarily attributed to: (1) Professional nurses communicate with discharged patients and family members through WeChat groups and phone consultations, addressing issues promptly and helping patients and families recognize the importance of intervention [14-15]. Additionally, community nurses quickly understand patients' individual conditions and develop tailored muscle exercise plans to enhance postoperative hip stability, thereby restoring normal hip function and daily self-care abilities through reasonable exercise regimens [16-17]. (2) For hospitals, nurses should thoroughly explain rehabilitation exercise safety to patients and families at discharge, ensuring strict adherence to medical instructions to prevent joint dislocation [18-19]. For communities, community nurses need to provide protection and guidance during patients 'specialized rehabilitation exercises [20]. Early functional training can promote the gradual recovery of muscle strength and joint stability, accelerate venous return in affected limbs, and prevent complications such as muscle atrophy [21-22]. (3) Timely communication among hospitals, communities, and families allows patients to feel multi-faceted care and encouragement, significantly boosting their confidence [23-24]. The analysis shows higher rehabilitation compliance in the study group. Other findings indicate that patients in this nursing model actively participate in rehabilitation activities, further demonstrating that this approach effectively stimulates patients' initiative and enthusiasm.

In conclusion, the application of hospital-community-family collaborative rehabilitation nursing mode can effectively improve the hip joint function score of elderly patients with hip replacement surgery, greatly reduce the incidence of postoperative rehabilitation complications, promote the gradual restoration of patients' daily living ability, and fully stimulate the active enthusiasm of patients in the process of nursing intervention.

Competing Interests

The authors declare no competing interests.

Funding Statement

Baise City Scientific Research and Technology Development Plan self-financing project (No.: Baike 20250307).

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