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Original Article

Effects of high-quality nursing on patients after orthopedic surgery with deep venous thrombosis of the lower extremities

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Abstract: Objective: The aim of the current study was to investigate the effects of high-quality nursing on patients undergoing orthopedic surgery with deep venous thrombosis of the lower extremities. Methods: Retrospective analysis was carried out on 106 patients after orthopedic surgery, enrolled in Weifang No.2 People's Hospital. They were divided into the observation group (using high-quality nursing mode, n=53) and control group (using routine nursing mode, n=53). Improvements in adverse emotions, quality of life, hospitalization expenses, hospitalization times, nursing satisfaction, and incidence rates of deep venous thrombosis of the lower extremities were compared. Results: Differences between high energy consumption groups and low energy consumption groups were statistically significant (P<0.05). Postoperative deep venous thrombosis rates of the observation group were significantly lower than those of the control group (P<0.05). SDS and SAS scores of the observation group were significantly lower than those of the control group (P<0.001). Scores concerning social function, physical pain, physiological function, mental health, and physiological roles of the observation group were significantly higher than those of the control group, after 3 months of nursing intervention (P<0.001). Nursing satisfaction levels of the observation group were significantly higher than those of the control group (P<0.05). Conclusion: High-quality nursing can better improve quality of life and emotional improvement levels of patients after orthopedic surgery, reducing incidence rates of deep venous thrombosis of the lower extremities, compared to routine nursing.

Keywords: High quality nursing, orthopedic surgery, deep venous thrombosis of lower extremities, nursing satisfaction

Introduction

Deep venous thrombosis of the lower extremities is a common complication after major orthopedic surgery. It refers to the coagulation of venous blood in the deep veins of the lower extremities [1, 2]. Many related studies have shown that deep venous thrombosis of the lower extremities is an important cause of disability and death in hospitalized patients [3, 4]. Incidence of deep venous thrombosis of the lower extremities is extremely high after major orthopedic surgery [5]. Deep venous thrombosis of the lower extremities is a common cardiovascular disease, second only to coronary artery disease and cerebrovascular disease [6]. Deep venous thrombosis of the lower extremities is also the main cause of pulmonary embolisms, which are extremely harmful [4]. Therefore, intervention concerning deep venous thrombosis of the lower extremities should be perfected clinically. Great attention should be paid to prevention or intervention of this disease. Related reports have shown that routine venous thrombosis prevention is recommended by major physician associations after major orthopedic surgery [7].

Correct nursing modes play an important role in prevention of deep venous thrombosis of the lower extremities. These modes are a very important part in prevention of deep venous

thrombosis of the lower extremities [8]. Scientific nursing for orthopedic patients is especially important for people with this disease [9]. However, early symptoms are not obvious. It is difficult to diagnose this disease clinically. Therefore, the current basic nursing for patients after orthopedic surgery is not ideal for prevention of deep venous thrombosis of the lower extremities. The use of effective nursing modes in preventing or improving deep venous thrombosis of the lower extremities after orthopedic surgery is crucial [10, 11]. In this study, high-quality nursing was carried out based on patient conditions. The current study also explored the effects of high-quality nursing on patients undergoing orthopedic surgery with deep venous thrombosis of the lower extremities.

Materials and methods

Patients

From January to June 2018, a retrospective analysis of 106 patients undergoing orthopedic surgery was carried out in Weifang No.2 People's Hospital. They were divided into the observation group (using high-quality nursing mode) and control group (using routine nursing mode). Each group included 53 cases. Inclusion criteria: Patients enrolled in the Orthopedics Department of Weifang No.2 People's Hospital that underwent surgery. Exclusion criteria: Subjects with a history of thrombosis; Subjects with coagulation, lung, and renal dysfunction; Subjects with infectious diseases or mental illness. The patients and families were informed in advance of the study and informed consent was obtained. The study was approved by the Weifang No.2 People's Hospital Ethics Committee.

Nursing methods

Patients in the control group were treated with basic nursing intervention. Relevant nursing staff members strictly followed the advice of the doctors, combined with the actual conditions of the patient, guiding patient postoperative care. Moreover, formation of deep venous thrombosis was prevented by conventional methods, as well as through management of intravenous infusion pathways. Relevant caregivers ensured the safety of nursing work and provided clinical symptomatic nursing for patients. The nursing staff avoided invasive infusions of the lower limbs, preventing irritation. They guided patients in carrying out functional exercises of the lower limbs and conducted correct health education for the patients with deep venous thrombosis of lower extremities. According to the actual situation of the patient, appropriate anticoagulant drugs were given based on doctor recommendations.

Patients in the observation group were given high-quality nursing based on basic nursing. (1) The nursing staff performed high-quality preoperative basic nursing, provided patients with pre-operative health education, informed the patients and their families how to effectively prevent deep venous thrombosis of lower extremities, and communicated with patients, assisting them in completing various physical examinations; (2) Lying position nursing: To alleviate discomfort caused by postoperative edemas, the relevant nursing staff guided the patients to choose the correct position, according to the doctor's advice. To promote venous return to the affected limbs and to reduce venous pressure, the nursing staff raised the patient's limbs to a height of 20 to 30 cm above the horizontal plane of the heart. They also regularly massaged the thighs and knees to ensure local blood flow and blood circulation; (3) Health education and psychological nursing: Due to the long-term pain and treatment of limbs, anxiety, anxiety, depression, and other negative emotions often occur. Therefore, the relevant nursing staff patiently increased patient understanding of deep venous thrombosis of the lower extremities. The staff guided them in understanding more about the etiology, treatment, and prognosis of deep venous thrombosis of the lower extremities; (4) Drug nursing: To prevent the formation of deep venous thrombosis of the lower limbs more effectively, the nursing staff gave patients low molecular weight heparin, low dose heparin, or oral anticoagulants, according to doctor recommendations. Bleeding status was closely observed during the use of medication; (5) Dietary nursing: The nursing staff prepared light diets, controlled the calories consumed by patients, and instructed patients to eat low-fat, low-calorie, low-sugar, low-cholesterol, and digestible high-fiber foods. They also helped them drink more water, avoid venous return of the lower extremities due to constipation, and reduce the risk of deep venous thrombosis of the lower extremities due to high intra-abdominal pressure; (6) Functional exercise: The nursing staff guided

Table 1. General baseline data of patients in both groups [n (%)]

Group	Observation group (n=53)	Control group (n=53)	t/X^2	*P*
Gender			0.038	0.846
Male	29 (54.72)	28 (52.83)		
Female	24 (45.28)	25 (47.17)		
Age (years)	60.24±14.09	61.07±13.68	0.308	0.759
Weight (Kg)	58.13±5.20	57.95±5.13	0.180	0.858
Medical insurance			<0.001	<0.001
Reimburse	44 (83.02)	44 (83.02)		
Self-pay	9 (16.98)	9 (16.98)		
Routine blood				
Hb (gm/dl)	9.27±1.53	11.67±3.18	4.951	<0.001
RBC ($\times10^{12}$/L)	4.01±0.64	5.29±0.39	12.430	<0.001
PLT ($\times10^{9}$/L)	153.22±27.43	144.26±31.63	1.558	0.122
Liver function				
ALT (U/L)	22.60±13.57	21.82±11.43	0.320	0.750
AST (U/L)	17.79±9.23	16.99±10.12	0.425	0.672
Renal function				
TP (g/L)	126.18±13.17	74.03±12.59	20.840	<0.001
UREA (mmol/L)	8.48±1.84	4.05±1.63	13.120	<0.001
CRE (ìmol/L)	190.13±27.42	101.38±18.09	19.670	<0.001
UA (ìmol/L)	586.14±36.25	206.31±50.50	44.480	<0.001

the patients after orthopedic surgery in performing muscle contraction exercises based on limb elevation. However, muscle contraction exercises were gently performed to avoid mechanical damage. If the patients bled, the nursing staff promptly informed the attending doctor and provided medication or dosage adjustments, according to patient conditions.

Observation indicators and evaluation criteria

(1) Self-rating depression scale (SDS) (Supplementary appendix-1) and Self-Rating Anxiety Scale (SAS) (Supplementary appendix-1) scores were used to evaluate improvements in adverse emotions in the two groups [12, 13]. Higher scores indicate worse moods; (2) The simplified SF-36 scale was used to evaluate quality of life levels of the two groups of patients 3 months after nursing intervention [14]. Main items for evaluation included social function, physical pain, physiological function, mental health, and physiological roles. Higher scores indicate better results. Nursing satisfaction levels of the two groups of patients 3 months after nursing intervention were also recorded; (3) Evaluation of hospitalization expenses and hospitalization times of two groups of patients: High energy consumption: Hospitalization times of more than 1 month and hospitalization expenses exceeding 50,000 yuan; Higher energy consumption: Hospitalization times of less than 1 month and hospitalization expenses of less than 50,000 yuan; Normal energy consumption: Hospitalization times within 15 to 25 days and hospitalization expenses within 15,000 to 30,000 yuan; Lower energy consumption: Hospitalization times of less than 15 days and hospitalization expenses less than 15,000 yuan; and (4) Deep venous thrombosis of the lower extremities and nursing satisfaction levels after orthopedic surgery were compared between the two groups of patients.

Statistical methods

Statistical analysis was performed using SPSS19.0 (Asia Analytics Formerly SPSS China). Measurement data are expressed as (X±S). Enumeration data were analyzed by χ^2 tests. Paired t-tests were used before and after comparisons within the groups. Independent samples t-tests were used for comparisons at the same time points between the groups. *P*-values less than 0.05 indicate statistical significance.

Results

No significant differences in baseline data between the two groups

The age range of the observation group was (39-79) years old. The average age was (60.24± 14.09) years old. The age range of the control group was (40-82) years old. The average age was (61.07±13.68) years old. There were no significant differences in general data between the two groups (P>0.05), which were comparable (**Table 1**).

Comparison of expenses and hospitalization times between the observation group and control group

Patients with high energy consumption and higher energy consumption in the observation group were less than those of the control group.

Table 2. Comparison of costs and hospitalization times between the observation group and control group

Group	n	High energy consumption	Higher energy consumption	Normal energy consumption	Low energy consumption
Observation group	53	2 (3.77)*	14 (26.42)	29 (54.72)	8 (15.09)*
Control group	53	8 (15.09)	20 (37.74)	23 (41.51)	2 (3.77)
X^2		3.975	1.559	1.359	3.975
P		0.046	0.212	0.244	0.046

Note: *indicates that differences between this group and the control group are statistically significant (P<0.05).

Table 3. Deep vein thrombosis of the lower extremities after orthopedic surgery in the two groups

Group	n	Postoperative deep venous thrombosis rate	Embolism cases	
			Completeness	Incompleteness
Observation group	53	9 (16.98)*	1 (1.89)*	8 (15.09)
Control group	53	23 (43.40)	7 (13.21)	16 (30.19)
X^2		8.774	4.867	3.447
P		0.003	0.027	0.063

Note: *indicates that differences between this group and the control group are statistically significant (P<0.05).

Differences between the two groups were statistically significant (P<0.05). Patients with normal energy consumption and low energy consumption in the observation group were more than those of the control group. Differences between the two groups were statistically significant (P<0.05; **Table 2**).

Observation of deep venous thrombosis of the lower extremities after orthopedic surgery between the observation group and control group

Postoperative deep venous thrombosis rates of the lower extremities in the observation group were significantly lower than those of the control group (P<0.05). Embolism rates in the observation group were significantly lower than those in the control group. Differences were statistically significant (P<0.05; **Table 3**).

Improvement in adverse emotions before and after nursing between the observation group and control group

Comparison of SDS scores between the observation group and control group before and after nursing: SDS scores after nursing were significantly lower than those before nursing. Differences were statistically significant (P<0.001). There were no statistical differences in SDS scores between the observation group and control group before nursing (P> 0.05). SDS scores of the observation group after nursing were significantly lower than those of the control group. Differences were statistically significant (P<0.001; **Figure 1**).

Comparison of SAS scores between the observation group and control group before and after nursing: SAS scores after nursing were significantly lower than those before nursing. Differences were statistically significant (P<0.001). There were no statistical differences in SAS scores between the observation group and control group before nursing (P>0.05). SAS scores of the observation group after nursing were significantly lower than those of the control group. Differences were statistically significant (P<0.001; **Figure 2**).

Comparison of quality of life scores between the observation group and control group 3 months after nursing intervention: Scores concerning social function, physical pain, physiological function, mental health, and physiological roles of the observation group were significantly higher than those of the control group 3 months after nursing intervention. Differences were statistically significant (P< 0.001; **Table 4**).

Comparison of nursing satisfaction levels between the two groups of patients: Nursing satisfaction levels of the observation group were significantly higher than those of the control group. Nursing dissatisfaction levels of the observation group were significantly lower than those of the control group. Differences were statistically significant (P<0.05). Results suggest that patients undergoing orthopedic sur-

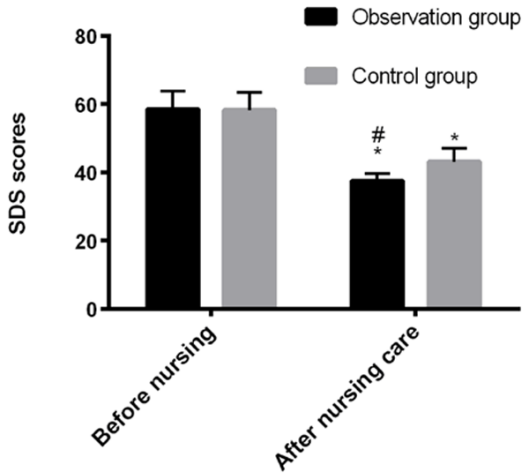

Figure 1. Comparison of SDS scores between the observation group and control group before and after nursing. SDS scores of the two groups after nursing were significantly lower than those before nursing and the differences were statistically significant (P<0.001). SDS scores of the observation group after nursing were significantly lower than those of the control group and the differences were statistically significant (P<0.001). Note: *The SDS score of this group was significantly lower than that before nursing and the difference was statistically significant (P<0.001). #indicates that the SDS score of this group after nursing was significantly lower than that of the control group and the difference was statistically significant (P<0.001).

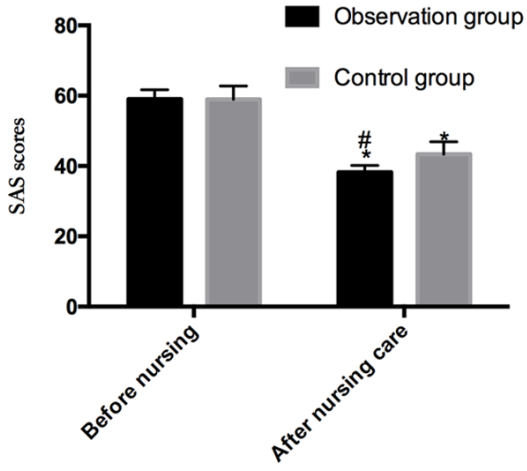

Figure 2. Comparison of SAS scores between the observation group and control group before and after nursing. SAS scores of the two groups after nursing were significantly lower than those before nursing and the differences were statistically significant (P<0.001). SAS scores of the observation group after nursing were significantly lower than those of the control group and the difference was statistically significant (P<0.001). Note: *The SAS score of this group was significantly lower than that before nursing and the difference was statistically significant (P<0.001). #indicates that the SAS score of this group after nursing was significantly lower than that of the control group and the difference was statistically significant (P<0.001).

gery were highly satisfied with high-quality nursing intervention (**Table 5**).

Discussion

High-quality nursing considers patients as the core of clinical care [15]. To ensure the safety of patients, relevant medical personnel should take care of all aspects for preoperative and postoperative patients [16]. Clinical nursing focuses on postoperative orthopedic patients, aiming to prevent and improve deep venous thrombosis of the lower extremities. It is especially important that the nursing staff be trained to make the nursing work more targeted [17]. When high-quality nursing intervention is carried out, patient medical advice should be strictly followed. Actual patient conditions should be combined in guiding patient postoperative care [18]. Related reports have shown that health psychology education in high-quality nursing can enhance patient medical compliance and strengthen emotional communication [19]. In this study, high-quality nursing was carried out, aiming to explore the effects of high-quality nursing on patients undergoing orthopedic surgery with deep venous thrombosis of the lower extremities.

The current study first compared hospitalization expenses and time between the observation group and control group. Patients with high-quality nursing intervention, high energy consumption, and higher energy consumption were less in number, compared to those with routine nursing. Differences between the two groups were statistically significant. Patients with high-quality nursing intervention in normal energy consumption and low energy consumption were more in number than those with routine nursing. Differences between the two groups were statistically significant. Previous reports have shown that hospitalization times and high medical expenses have a great impact on patient moods and postoperative results [20, 21]. Therefore, implementation of high-quality nursing intervention can shorten hospitalization times and reduce hospitalization

Table 4. Comparison of quality of life after 3 months of nursing intervention in the two groups

Group	n	Social function	Somatic pain	Physiological function	Mental Health	Physiological function
Observation group	53	129.24±4.50	137.43±6.12	121.23±5.65	99.92±4.24	136.64±5.72
Control group	53	70.46±2.72	70.49±4.66	71.52±5.13	70.62±3.28	72.92±3.57
t		81.380	63.350	47.420	39.790	68.800
P		<0.001	<0.001	<0.001	<0.001	<0.001

Table 5. Nursing satisfaction of the two groups of patients [n (%)]

Group	n	Great satisfaction	Satisfied	Not satisfied	Total satisfaction
Observation group	53	40 (75.47)	11 (20.76)	2 (3.77)*	51 (96.23)*
Control group	53	21 (39.62)	17 (32.08)	15 (28.30)	38 (71.70)
X^2		-	-	11.840	11.840
P		-	-	<0.001	<0.001

Note: *indicates that differences between the group and the control group are statistically significant (P<0.05).

expenses, to a certain extent. This is of great importance in the rehabilitation of patients after orthopedic surgery. Next, the current study analyzed deep venous thrombosis of the lower extremities after orthopedic surgery in the observation group and control group. Results showed that postoperative deep venous thrombosis rates of patients with high-quality nursing intervention were significantly lower than those of patients with routine nursing. Postoperative embolism rates of patients with high-quality nursing intervention were significantly lower than those of patients with routine nursing. Differences were statistically significant. Many related reports have shown that high-quality nursing services have a great effect on prevention and improvement of postoperative deep venous thrombosis of the lower extremities in orthopedic surgery patients [22, 23]. A similar success of combined pharmacological and mechanical prophylactic measures in decreasing the risk of DVT after orthopedic surgery was stated in a study in China [24]. Offering further support with more objective evidence, present study results demonstrate significantly better laboratory findings related to orthopedic surgery patient risks among patients in the study group. These investigations are the cornerstone in the close monitoring of patients at risk of orthopedic surgery. Hughes Driscoll et al. highlighted that updated and clearly written guidelines, along with organization-wide procedures and staff education, are sufficient to change practice and improve compliance [25]. The current study observed improvements in adverse emotions before and after nursing in the observation group and control group. It was found that SDS and SAS scores in the two groups after nursing were significantly lower than those before nursing. SDS and SAS scores in the observation group after nursing were significantly lower than those in the control group. Differences were statistically significant. At present, most nursing models focus on patient psychological and ideological nursing [26, 27]. Studies have shown that patients with healthy psychological quality recover much better than patients with emotional depression or anxiety [28]. Therefore, high-quality nursing intervention is better than routine nursing concerning the psychological state, daily anxiety, and adjustment of depression after orthopedic surgery. High-quality nursing intervention places more emphasis on controlling patient health emotions based on the routine administration, daily life arrangement, and examination of patient physical indicators. Finally, the current study compared quality of life scores and nursing satisfaction 3 months after nursing intervention between the observation group and control group. Scores concerning social function, physical pain, physiological function, mental health, and physiological role 3 months after nursing intervention in implementation of high-quality nursing intervention were significantly higher than those of routine nursing patients. Satisfaction levels of patients with high-quality nursing intervention were significantly higher than those of patients with routine nursing. Differences were statistically significant. Therefore, results suggest that high-quality nursing intervention provides better effects on quality of life levels of patients after

orthopedic surgery, compared to routine nursing intervention. Moreover, patients are more satisfied with high-quality nursing. Thus, it is worthy of clinical promotion. Many similar studies have shown that high-quality nursing has better effects on quality of life levels of patients [29, 30].

There were some shortcomings to the current study, however. For example, the follow-up time was only 3 months. There were no follow-ups for the latter conditions of the patients. Included patients had certain regional characteristics. Also, the nursing program may not have been good enough. These shortcomings may have affected study results.

In summary, high-quality nursing is more effective than routine nursing in improving quality of life levels and moods of patients after orthopedic surgery. High-quality nursing plays an important role in prevention and improvements of postoperative deep venous thrombosis of the lower extremities of orthopedic surgery patients. Patients have been more satisfied with high-quality nursing. Thus, it has better clinical application value.

Disclosure of conflict of interest

None.

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