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Original Article

Application efficacy of bundled nursing management in care of elderly patients with pressure ulcers

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Abstract: Objective: To discuss the efficacy of bundled nursing management in nursing of elderly patients with pressure ulcers. Methods: 148 hospitalized elderly patients with pressure ulcers in our hospital were taken as the study subjects. The study subjects were randomly assigned to the observation group (n=74) and the control group (n=74) using the random number table method. The control group adopted the routine nursing model, while the observation group adopted the bundled nursing. A comparison of the two groups included the cure rate of pressure ulcers, anxiety (using self-rating anxiety scale), depression (using self-rating depression scale), quality of living (using MOS SF-36 scale), sleep quality and patient satisfaction. Results: The cure rate of pressure ulcers in the observation group was greater than that in the control group (P<0.01). The SAS and SDS scores in the observation group were significantly less than those in the control group (P<0.001). The scores of physical function, general health, social function, emotional role, and mental health in the observation group were greater than those in the control group (all P<0.01). The sleep quality scores in the observation group were less than those in the control group (all P<0.001). The nursing satisfaction in the observation group was greater than that in the control group (P<0.05). Conclusion: The application of bundled nursing management in the nursing of elderly patients with pressure ulcers is effective, which can promote the cure rate of pressure ulcers, improve the depression or anxiety, quality of living and sleep of patients, and enhance patient satisfaction. It deserves clinical promotion and use.

Keywords: Bundled nursing, pressure ulcers, elderly patients, quality of living, anxiety, depression

Introduction

Pressure ulcers are defined as tissue ulceration and necrosis owing to compression of local tissues for a long time and the development of continuous ischemia, hypoxia, and malnutrition, mostly occurring at the bony prominences of the scapula, sacrococcygeal region, and heel [1]. Its etiology is closely related to stress factors (vertical pressure, friction, shear force), patient nutritional status, reduced skin resistance, and other factors [2, 3]. Studies have reported that about 60,000 people die each year from combined pressure ulcer signs [4]. In the elderly, due to the gradual decline of organ function, poor nutritional status of the body, thin and dry skin, poor elasticity, insufficient sensitivity, and often associated with hypertension, diabetes and other chronic diseases, the body resistance is weakened, and the incidence of pressure ulcers is higher than other age groups [5]. The disease itself causes physical and mental trauma to patients, and the occurrence of pressure ulcers further increases the risk of the disease, and easily leads to anxiety, fear and loss and other negative emotions in patients, seriously affecting the recovery and quality of living of patients [6]. Enhancing the prognosis of patients with disease treatment, removing or relieving depression and anxiety, and promoting the quality of living of patients have become a focus of nursing work. Bundled nursing is a comprehensive nursing intervention program based on existing evidence-based medicine, which can provide a comprehensive, total, patient-centered diagnosis and treatment program and high-quality nursing services for discharged patients, and it is important for improving patient treatment outcomes [7, 8]. At present, although bundled nursing has been applied to the nursing of pressure ulcers in elderly patients at home and

abroad, which can effectively improve the cure rate of pressure ulcers, it does not pay attention to the impact on depression, anxiety status and quality of living in elderly patients [9, 10]. Therefore, this study mainly discussed the application efficacy of bundled nursing management in nursing of pressure ulcers in elderly patients, and focused on the discussion of the efficacy of this nursing intervention model on the cure rate, anxiety, depression, quality of living and satisfaction of patients, aiming to offer theoretical direction for clinical nursing.

Materials and methods

General data

A prospective study method was adopted. 148 elderly patients with pressure ulcers hospitalized in our hospital from May 23, 2019 to June 30, 2020 were taken as the study subjects. The study subjects were randomly assigned to the observation group (n=74) and the control group (n=74) using the random number table. The general data of the two groups are shown in results section. The Medical Ethics Committee of our hospital approved this study.

Inclusion criteria: 1) Meet National Pressure Ulcer Advisory Panel (NPUAP) diagnostic criteria for pressure ulcers [11]; 2) Aged >60 years old; 3) Patients with normal cognitive function; 4) Patients agreed to take part in this study and the Informed Consent Form was signed.

Exclusion criteria: 1) Concomitant important organ dysfunction disease, systemic infectious diseases; 2) History of mental illness or cognitive impairment.

Method

The control group adopted the routine nursing model, including asking patients to turn over every 1-2 h; strengthening skin nursing to prevent infection; promoting blood circulation through warm water sponge bath and massage; asking the patients to strengthen nutrition and consume more foods high in vitamins and protein [12].

The observation group used the bundled nursing model based on the control group, and the specific measures included: (1) The establishment of a bundled nursing group composed of 5 medical staff, including 1 doctor, 1 dietitian, 1 wound therapist, and 4 nurses in charge; (2) The specific measures: 1) The division of labor of the group members: the two nurses in charge were responsible for searching the relevant literature, and according to the evidence, in combination with the reality of the patient, scientific and reasonable intervention measures were developed; the doctor and the wound therapist were responsible for the patient's pressure ulcers wound treatment; the dietitian was responsible for drafting the dietary prescription; 1 nurse in charge was responsible for the psychological counseling of the patient and his family members; 1 nurse in charge was responsible for the health education; 2) Psychological counseling: the patient was given psychological counseling, the basic knowledge of the disease was explained to the patient, and good communication was maintained, so that the patient could establish a positive mentality and reduce the negative emotions caused by pressure ulcers. 3) Nutritional support: make a comprehensive evaluation on the patient's body, develop a nutritional program suitable for the patient, and use gastrointestinal nutrition pump for treatment when necessary; 4) Use publicity brochure and hold knowledge lectures to explain the disease development process and prognostic factors of pressure ulcers to the patients and their families; (3) Effect evaluation: evaluate the effect of nursing intervention every week, and adjust the intervention program [10].

Stage of pressure ulcers: Stage I (ruddy stage of blood stasis): the skin surface of the patient's pressure ulcer site was not damaged, but there was redness, heat, swelling, wood, and pain, and 30 minutes after relieving the pressure, the skin color could not return to normal as irreversible changes; Stage II (inflammatory infiltration stage): the patient's pressure ulcer site was purple and tender, forming blisters, easy to break, had invaded the subcutaneous tissue, and had induration; Stage III (shallow ulcer stage): the patient's pressure ulcer site blisters expanded, full-thickness ulceration, yellowish fluid exudation, easy to infect, pit-like collapse, severe pain, and could invade the subcutaneous and deep tissues; Stage IV (necrotic ulcer stage): the patient's pressure ulcer site deepened and darkened, purulent secretions with odor appeared, and the necrotic site invaded the subdermal and muscular layers, which could cause systemic infection or could be life-threatening.

Table 1. Comparison of general baseline data between the two groups (n/%, $\bar{x} \pm sd$)

Index	Observation group (n=74)	Control group (n=74)	X^2/t	P
Age (years old)	70.4±3.1	69.6±3.8	1.403	0.163
Sex			0.016	0.901
Male	42	43		
Female	32	31		
Concomitant disease				
Hypertension	29	30	0.030	0.866
Coronary heart disease	28	24	0.471	0.492
Diabetes	19	21	0.144	0.711
Fracture	10	8	0.253	0.615
Clinical staging of pressure ulcers			0.121	0.940
Stage I	33	35		
Stage II	30	29		
Stage III-IV	11	10		

Table 2. Comparison of cure rate of pressure ulcers between the two groups (n%)

Group	Stage I	Stage II	Stage III-IV	Total cure
Observation group (n=74)	33 (44.59)	30 (40.54)	3 (4.05)	63 (89.19)
Control (n=74)	30 (40.54)	18 (24.32)	1 (1.35)	49 (66.22)
X^2				7.191
P				0.007

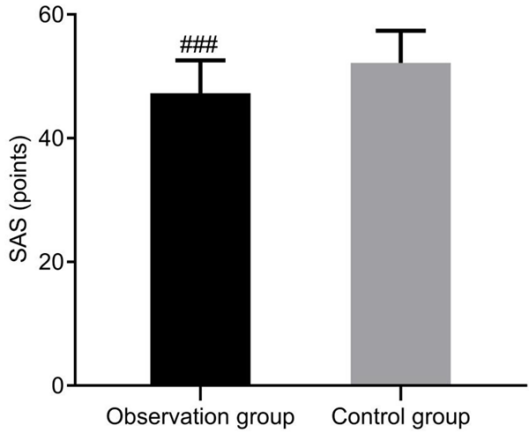

Figure 1. Comparison of SAS scores between the two groups. Compared with control group, ###P<0.001. SAS: self-rating anxiety scale.

Outcome measures

Primary outcome measures: (1) The therapeutic effects of pressure ulcer was compared between the two groups. Evaluation criteria: ineffective: no signs of improvement in the wound surface of pressure ulcer site, new pressure ulcer wound surface, expansion of original lesion, aggravation or even life-threatening; improved: the wound surface of pressure ulcer site was controlled, the length, width and depth were reduced, the wound exudate was reduced, the granulation tissue gradually grew, the pain was relieved, and no new pressure ulcer surface appeared; cured: the wound surface of pressure ulcer site disappeared, the wound surface had no secretion, had completely healed, the granulation tissue grew well, there was no infection, the skin had no pain, and no new pressure ulcer surface appeared, cure rate = number of cured cases/total number of cases * 100% [13]. (2) One month after the intervention, the anxiety status of the two groups was compared: the anxiety status of the patients was evaluated by the self-rating anxiety scale (SAS), and the SAS score ≥50 indicated that it was accompanied by anxiety symptoms, and its degree increased with the score [14]. (3) One month after the intervention, the depression status of the two groups was compared: the self-rating depression scale (SDS) was used to evaluate the depression status of the patients (53-62 points were mild depression, 63-72 points were moderate depression, >72 points were severe depression), and the degree of depression increased with the score [15]. (4) One month after the intervention, the quality of living of the two groups was compared: the quality of living of the patients was assessed using the MOS SF-36, which includes five dimensions: physical function, general health, social function, emotional role, and mental health, with a full score of 100 points in all dimensions, and a greater score indicates a greater quality of living in the relevant dimensions [16].

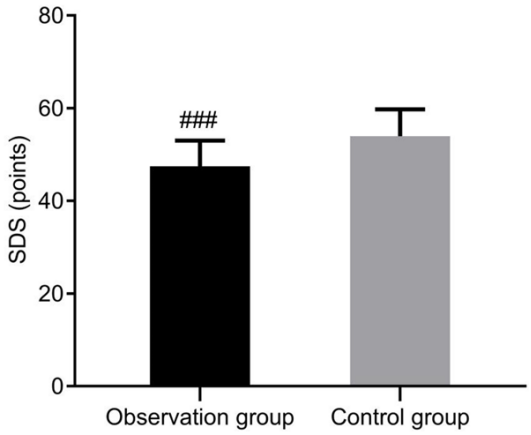

Figure 2. Comparison of SDS scores between the two groups. Compared with control group, ###P<0.001. SDS: self-rating depression scale.

Secondary outcome measures: (1) One month after the intervention, the sleep quality of the two groups was compared. It evaluated by the Pittsburgh Sleep Quality Index (PSQI), and the greater the score, the worse the sleep quality [17]. (2) At discharge, patients were asked to fill in a self-made satisfaction survey scale in our hospital to assess nursing satisfaction, which was divided into satisfactory (90-100 points), basically satisfactory (60-89 points), and unsatisfactory (<60 points), and satisfaction = (satisfactory + basically satisfactory) cases/ total cases * 100%.

Statistical analysis

Data statistics adopted SPSS 20.0. Enumeration data were expressed as n/% and compared with χ^2 test. Measurement data in accordance with a normal distribution were expressed as mean ± standard deviation ($\bar{x}$ ± sd). Independent t test was used for comparison between groups. Rank sum test was used for comparison of composition between groups of grade data. P<0.05 was deemed significant.

Results

Comparison of general baseline data

In the two groups, there were no significant differences in age, gender, combined diseases and stage (all P>0.05), which could be compared between the two groups. See **Table 1**.

Comparison of the cure rate of pressure ulcer

The cure rate of pressure ulcer in the observation group was greater than that in the control group (P<0.01). See **Table 2**.

Comparison of anxiety

The SAS score in the observation group was less than that in the control group (47.25±5.33 vs. 52.18±5.19), and the difference was significant (t=5.701, P<0.001). See **Figure 1**.

Comparison of depression

The SDS scores in the observation group were less than that in the control group (47.45± 5.56 vs. 53.97±5.76), and the difference was statistically significant (t=7.006, P<0.001). See **Figure 2**.

Comparison of quality of life

In comparison with the control group, the scores of physical function, general health, social function, emotional role, and mental health dimensions in the observation group were greater than those in the control group, and the differences were significant (all P< 0.01). See **Table 3**.

Comparison of sleep quality

In comparison with control group, PSQI score in observation group was less than that in control group (11.92±2.12 vs. 14.66±3.38), and the difference was significant (t=5.908, P<0.001). See **Figure 3**.

Comparison of nursing satisfaction

37 cases of satisfaction with continuous nursing in the observation group, 29 cases of basic satisfaction, and 8 cases of dissatisfaction, with the satisfaction rate of 89.19%. 29 cases of satisfaction with continuous nursing in the control group, 28 cases of basic satisfaction, and 17 cases of dissatisfaction, with the satisfaction rate of 77.03%. The observation group had significantly greater satisfaction with continuous nursing than the control group (P<0.05). See **Table 4**.

Discussion

Bundled care was originally proposed by American Institute for the Advancement of

Table 3. Comparison of quality of living score MOS SF-36 between the two groups (points, $\bar{x} \pm sd$)

Quality of living score	Observation group (n=74)	Control group (n=74)	t	P
Physical function	78.14±10.25	65.08±9.11	7.628	0.000
General health	91.60±10.23	85.60±12.12	3.254	0.001
Social function	72.31±11.21	65.58±10.20	3.820	0.000
Emotional role	63.38±9.02	55.57±7.13	5.843	0.000
Mental health	68.15±10.91	57.42±7.12	7.085	0.000

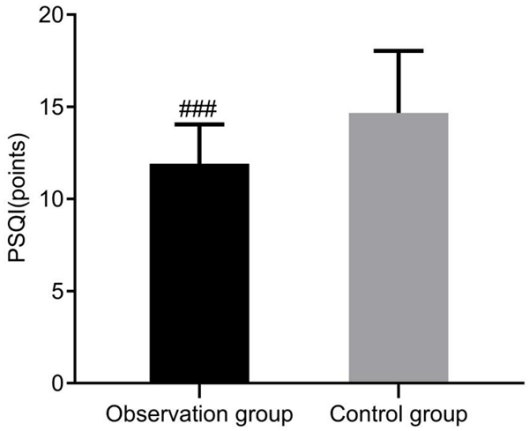

Figure 3. Comparison of PSQI scores between the two groups. Compared with control group, ###P<0.001. PSQI: Pittsburgh Sleep Quality Index.

Research, based on of providing patients with the best medical care services, combining traditional care measures with evidence-based medicine, combining seeking relevant evidence with the actual situation, and developing a scientific and reasonable and practical care plan so that patients can obtain the best care outcome [18]. Since the introduction of bundled nursing in clinical practice, it has been widely used in the nursing of severe diseases, postoperative surgery, and chronic diseases, achieving good results and improving the prognosis and nursing quality [19-22].

Peng et al. took 120 cases of elderly patients with pressure ulcers as the study subjects. The control group used conventional pressure ulcers nursing management, and the observation group used bundled nursing management. The results found that the cure rate of pressure ulcers in the observation group was greater than that in the control group. The study concluded bundled nursing could effectively improve the cure rate of pressure ulcers in elderly patients [10]. In this study, the observation group used the bundled nursing model and compared it with the routine nursing model of the control group. The results suggested the cure rate of pressure ulcers in the observation group was greater than that in the control group, indicating that bundled nursing model could effectively enhance the cure rate of pressure ulcers and promote the prognosis of patients, which was consistent with the above study results.

Elderly patients with pressure ulcers themselves have local skin damage, and the deterioration of epidermal regeneration ability in elderly patients, nutritional absorption function decline, poor healing ability, wounds prone to delayed healing, is a type of difficult to cure the disease. Elderly patients are bedridden for a long time and have poor self-care ability, often accompanied by anxiety and depression. Feng et al. concluded that the occurrence of postoperative pressure ulcers in elderly cancer patients is closely related to psycho-psychological factors, and the anxiety and depression status of patients with large area pressure ulcers are significantly greater than those of patients with small area pressure ulcers [23]. Wang et al. took 92 cases of cerebrovascular disease undergoing interventional therapy as the study subjects; the control group adopted routine nursing intervention, and the observation group adopted bundle nursing intervention. The results suggested that the SAS and SDS scores in the observation group were significantly less than those in the control group, and the study concluded that bundled nursing intervention could relieve the anxiety and depression of patients [24]. In this article, the observation group used the bundled nursing model, and compared it with the routine nursing model of the control group. The results revealed the SAS and SDS scores of the observation group were less than those of the control group, indicating that bundled nursing model could reduce the anxiety and depression of patients, which was related to the improvement of the cure rate of patients, and may also be due to the implementation of health education, psychological counseling, dietary guidance and other nursing for patients through one-on-one

Table 4. Comparison of satisfaction rate of nursing care between the two groups (n (%))

Group	Satisfied	Basically satisfied	Not satisfied	Satisfaction
Observation group (n=74)	37 (50.00)	29 (39.19)	8 (10.81)	66 (89.19)
Control group (n=74)	29 (39.19)	28 (37.84)	17 (22.97)	57 (77.03)
X^2				3.901
P				0.048

counseling and communication, improving the negative emotions of patients.

The bundled care model is important for enhancing the quality of living of patients. Hu et al. took 92 stroke patients with swallowing dysfunction as the study subjects; the control group adopted routine nursing measures, the observation group adopted bundle nursing intervention. The results found that the quality of living of the observation group was significantly better than that of the control group, the study concluded that bundled nursing intervention can improve the quality of life of stroke patients with swallowing dysfunction [18]. In this study, the scores of all dimensions of quality of life in the observation group were greater than those in the control group, indicating that the quality of life in the observation group was superior to the control group, which again demonstrated the advantages of bundled nursing measures and was consistent with the above study results. Moreover, the sleep quality scores of the observation group were less than those of the control group, indicating that the sleep quality of the observation group was better than that of the control group, and bundled nursing could enhance the sleep quality of patients.

Finally, this research investigated the satisfaction of patients in the two groups with different nursing models, and found that the satisfaction of patients in the observation group was significantly greater than that in the control group, which may be due to the fact that the bundled nursing model improved the cure rate of patients with pressure ulcers, reduced the anxiety and depression of patients, improved the quality of living of patients, and had a better subjective experience from patients seeking medical treatment. Nevertheless, the sample capacity of this research is small, the negative emotions of caring for the family members of elderly patients with pressure ulcers were not observed, and a large sample multicenter long-term nursing effect study should be conducted at a later stage to confirm the feasibility and importance of the bundled nursing model in elderly patients with pressure ulcers and their families.

In summary, the application efficacy of bundle nursing management in nursing care of elderly patients with pressure ulcers is good, which may enhance the cure rate of pressure ulcers, reduce the depression, anxiety, and raise thdbe quality of living and sleep of patients, and elevate patient satisfaction. It deserves clinical promotion and use.

Disclosure of conflict of interest

None.

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References

[1] Smith B and Field L. Pressure ulcers. Nursing Care. Edited by Smith B and Field L, 2019.
[2] Young M. Medical device-related pressure ulcers: a clear case of iatrogenic harm. Br J Nurs 2018; 27: S6-S13.
[3] Singh R, Wadhwani J, Rohilla RK and Kaur K. Proximal femoral resection and Tensor Fascia Lata flap for recalcitrant trochanteric pressure ulcer. Spinal Cord Ser Cases 2019; 5: 15.
[4] Ferris A, Price A and Harding K. Pressure ulcers in patients receiving palliative care: a systematic review. Palliat Med 2019; 33: 770-782.
[5] Zhang PP, Shen HM, Xu JY, Zhou HY and Yuan X. Investigation on the prevalence rate of pressure ulcer in hospitalized patients and analysis on its prevention. Anhui Med 2018; 22: 569-573.
[6] Cristóbal L, Ortega MA, Asúnsolo Á, Romero B, Álvarez-Mon M, Buján J, Maldonado AA and García-Honduvilla N. Human skin model for mimic dermal studies in pathology with a clinical implication in pressure ulcers. Histol Histopathol 2018; 33: 959-970.
[7] Zhang FF and Yang HY. Effect of cluster nursing intervention mode on rehabilitation effect

and nursing quality of stroke patients. J Clin Med 2018; 22: 5-8+20.
[8] He X and Fan YZ. Application of cluster nursing in artificial airway management of severe neurosurgery patients. Chin J Mod Nurs 2019; 25: 422-424.
[9] Lu XH, Li YM, Chen K and Qin SH. Effect analysis of cluster nursing on preventing pressure ulcer in patients with heart failure. Smart Healthcare 2018; 4: 130-132.
[10] Luo X, Hu LY and Liu XL. Effect of cluster nursing mode on the outcome of pressure ulcer patients. J Nurs Qilu 2018; 24: 83-85.
[11] Stockton L, Gebhardt KS and Clark M. Pressure ulcers: clinical practice guideline. J Tissue Viability 2009; 18: 98-108.
[12] Li E, Yu CH and Liu XL. The role of wound specialist nursing group in pressure ulcer nursing managemen. China Matern Child Health Res 2017; 28: 548-549.
[13] Wang MM, Liang TY and He P. Application of cluster nursing management in pressure ulcer nursing of elderly patients. Chin J Med Guide 2016; 18: 300-300+302.
[14] Dunstan DA, Scott N and Todd AK. Screening for anxiety and depression: reassessing the utility of the Zung scales. BMC Psychiatry 2017; 17: 329.
[15] Sepehry AA. Zung self-rating depression scale. Springer New York. Edited by Sepehry AA, 2011.
[16] Vitorino D, Martins F, Souza A, Galdino D and Prado G. Utilizao do SF-36 em ensaios clínicos envolvendo pacientes fibromiálgicos: determinao de critérios mínimos de melhora clínic. Revista Neurociências 2004; 12: 147-151.
[17] Sun DL. Evaluation of the efficacy of endoscopic sinus surgery with sinusitis specific quality of life scale. World Clin Med 2017; 11: 81-83.
[18] Hu YQ and Zhong W. Effect of cluster nursing on quality of life, anxiety and depression of stroke patients with swallowing dysfunction. Anhui Med J 2019; 23: 2061-2065.
[19] He XL, Wang M and He YF. The value of cluster nursing strategy in ICU patient care. Med Clin Res 2017; 34: 200-202.
[20] Ren C. Nursing effect of cluster nursing combined with routine nursing in chronic obstructive pulmonary disease and its influence on the quality of life of patients. Lab Med Clin 2017; 14: 1641-1642.
[21] Yan W and Zheng XM. Effect of cluster nursing intervention on stress response and prognosis of patients with heart disease treated by subcutaneous low molecular weight heparin injection. Med Clin Res 2019; 36: 1243-1245.
[22] Guo XX, Li YL, Han X and Chen WL. Observation on the effect of cluster nursing on the prevention of complications in elderly patients with lower limb fracture. Nurs Res 2020; 34: 362-364.
[23] Feng DY and Qin LL. Correlation between pressure ulcer after surgical stress and psychological performance and coping style in elderly cancer patients. CTE Res 2004; 8: 7888-7890.
[24] Wang L and Zhang LX. Effect of cluster intervention on negative emotion and prognosis of patients with cerebrovascular intervention. Med Clin Res 2020; 37: 634-636.