

Original Article

Analysis of the effect of comprehensive nursing on pressure ulcers risk and psychological state in severe elderly patients

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Abstract: To analyze the effect of comprehensive nursing on pressure ulcers risk and psychological state in severe elderly patients. 103 elderly patients admitted to the Second Affiliated Hospital of Wenzhou Medical University before comprehensive nursing (January to December 2017, routine nursing care) were included in the control group, and 103 elderly patients after comprehensive care implementation (January to December 2018, comprehensive nursing care) were included in the observation group. The incidence and severity of pressure ulcers after admission were compared, the risk of pressure ulcers occurrence after nursing was evaluated in both groups, the formation time of pressure ulcers was counted, the physiological comfort, psychological state and quality of life were evaluated, and the satisfaction of the patients with the nursing work was investigated. The incidence of pressure ulcers was 11.65% in the observation group and 39.81% in the control group, and the severity of pressure ulcers was less than that in the control group ($P<0.05$). But after nursing, all sub-scores of the Braden score of the pressure ulcers risk were lower in the observation group ($P<0.05$). The formation time of pressure ulcers was shorter in the observation group than that in the control group, and the patient satisfaction score was higher than that in the control group ($P<0.05$). The scores of psychological state, physiological comfort and quality of life in the two groups were improved after the nursing compared with that before the treatment in this group ($P<0.05$), and those were all higher in the observation group ($P<0.05$). Comprehensive nursing can effectively reduce the risk of pressure ulcers occurrence in severe elderly patients, improve the psychological state of patients, and promote the physiological comfort and quality of life of patients, so as to improve patient satisfaction.

Keywords: Pressure ulcers, elderly, severe, psychological state, comprehensive nursing

Introduction

Pressure ulcers are a clinically common complication in critically ill patients with long-term bedridden. Its formation is mainly due to the need of stay in bed for a long time, so that the skin tissue has poor blood circulation under long-term compression, forming skin tissue hypoxia, and resulting in local swelling and pressure ulcers under compression [1-3]. Among them, older patients with serious illnesses are more likely to develop pressure ulcers as a result of a combination of autoimmune decline, more chronic underlying diseases, poor nutritional status and psychological stress. Pressure ulcers are mainly characterized by local pain, skin breakdown, redness and swelling,

and in severe cases, skin tissue necrosis may occur [4, 5]. Pressure ulcers not only adversely affect the health and quality of life of patients, but may even lead to a delay in the recovery process of the primary disease and an increase in the risk of clinical care [6]. Comprehensive nursing measures are aimed at actively preventing the formation of pressure ulcers in critically ill elderly patients, taking psychological interventions into account and providing comprehensive nursing to patients from both physical and psychological perspectives. It has been widely used in the diabetes nursing, orthopedic nursing, pneumonia nursing and other fields, and it is found that great satisfaction and remarkable outcomes have been obtained [7-12]. However, whether comprehensive nursing

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can improve the prognosis of ulcer pressure is rarely reported, so it deserves to be explored with a view to providing a novel method for ulcer pressure. The Second Affiliated Hospital of Wenzhou Medical University has been applying comprehensive nursing measures since January 2018. In order to correctly assess the effectiveness of its application, the hospital has conducted this special study.

Materials and methods

General information

The data of critically ill elderly patients in the Second Affiliated Hospital of Wenzhou Medical University were retrospectively analyzed, and a total of 103 elderly patients before the implementation of comprehensive nursing from January to December 2017 were included in the control group, 103 elderly patients after comprehensive care implementation from January to December 2018 were included in the observation group. In the control group, there were 58 cases of male and 45 cases of female; they aged 65-84 years, with an average of 74.36 ± 5.97 years. Primary diseases: there were 32 cases of respiratory failure, 49 cases of severe infection, and 22 cases of multiple organ failure. In the observation group, there were 56 cases of male and 47 cases of female; they aged 65-85 years, with an average of 74.61 ± 6.02 years. Primary diseases: there were 33 cases of respiratory failure, 47 cases of severe infection, and 23 cases of multiple organ failure. No significant difference was found in the two groups with respect to the general information ($P > 0.05$).

Inclusion and exclusion criteria

Inclusion criteria: critically ill patients who were admitted to the Second Affiliated Hospital of Wenzhou Medical University; critically ill elderly patients who were aged ≥ 65 years; patients who required bed rest; patients with complete clinical information; patients who or whose family members signed an informed consent form. Exclusion criteria: patients with combined diabetic peripheral vascular disease; patients with combined psychiatric disorders and consciousness dysfunction. The ethic committee of our hospital has approved this study.

Nursing methods

Control group: Routine care was given in the control group, including routine health education, routine cleaning, ward environment care, etc. It was necessary to understand the patient's feelings in a timely manner, help the patient to turnover on time to prevent the formation of pressure ulcers, and help the patient to perform appropriate activities according to the specific situation of the patient.

Observation group: The addition of comprehensive nursing measures to above-mentioned care measures were given in the observation group with specific measures. (1) Psychological intervention and health education. Psychological intervention and communication with patients were performed so as to assess their psychological state, answer their questions, encourage them to face the disease bravely with real and ideal prognosis cases, and find their mental pillars to mobilize their subjective enthusiasm for treatment and care. Their psychological state was regulated through reading, listening to music and other methods, positive cognitive intervention was carried out when necessary, and regular treatment was administered timely by psychiatrists for those with anxiety, depression and other severe psychological symptoms. All new nurses were trained to explain the causes of pressure ulcers, their preventive measures and hazards, the importance of active prevention of pressure ulcers, and correct, standardized and effective turnaround methods. Therefore, it was necessary to help patients to develop a prevention plan of pressure ulcers based on their specific situation. (2) Postural care. Critically ill patients were placed in the supine position in order to treat and prevent reflux and mis-absorption. For those without special requirements, it was necessary to keep the head of the bed elevated $30-45^\circ$, hence increasing the friction. The patient was turned over once every 2 h, followed by paying attention to the relief or reduction of pressure by keeping the original compressed sites; various soft pillows were utilized to assist the patient to be posed at lateral position with the body tilted 30 to 45° to one side, to observe in detail the pressure on the position of their bony prominence. Soft cushions and other means were used to reduce the pressure on the bony prominence as far as possible, further

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reducing the long-term pressure on a certain local skin. (3) Skin care. It was required to wipe the patient's skin with hot water, use massage oil to massage their position under the pressure to promote local skin blood circulation; the presence of abnormalities in the color and elasticity of their skin under the pressure was carefully observed while wiping and massaging. In the case of redness, edema, induration, blisters, and rash-like changes, the results were timely reported to the competent physician, and the corresponding treatment was given. Patients used the Coloplast foam dressing. Due to long-term bedridden, skin resistance of critically ill patients is poor, and easy to infect scabies, eczema and other skin diseases. Wanhua oil was given to embrocate at the time of each turnover, and traditional Chinese medicine decoction made from cortex phellodendri, scutellaria and Fructus Cnidii was administered daily to perform sponge bath, in order to clear heat and detoxicate, and dispel damp. (4) Dietary guidance. To improve the patient's cooperation, a dietary plan was jointly developed by the doctor and patients or their family members according to their dietary preferences. Besides, the daily diet was based on high vitamins, high protein, high calories, and the texture was based on soft and easily digestible food. More attention was given to ensure the intake of dietary fiber, the daily water intake was maintained at about 800-1500 ml, and conditionally drinkable fruit and vegetable juice, milk, etc. were also given. Patients who could not eat directly were timely given with enteral nutritional support with daily calories maintained at 2000 Kal; full nutritional preparations were given, or the patient's family members were instructed to prepare nutrition homogenate by proportionally mixing meat, starch, fiber, etc.

Observation indicators and criteria

Observation indicators: The incidence and severity of pressure ulcers of patients after hospitalization were compared, the formation time of pressure ulcers was counted, the risk of pressure ulcers occurrence, physical comfort, psychological state and quality of life were assessed, and patients' satisfaction with their care was surveyed.

Observation criteria: (1) Diagnosis and assessment of the severity of pressure ulcers were

performed based on the Staging Criteria for Pressure Ulcers developed by the US Pressure Ulcers Advisory Committee [13]. Specific criteria: redness was visible and did not recede in the pressed skin, and the skin was intact for I degree; blisters, lesions and superficial ulcerations were visible on the pressed skin, without necrosis for II degree; damage to the pressed skin was noted, with oozing, pits and tissue necrosis for III degree; widespread necrosis and deep ulceration of the pressed skin were noted, with subcutaneous tissue necrosis for IV stage; the total number of cases in each stage was the occurrence of pressure ulcers. (2) Physiological comfort and patient satisfaction were surveyed using the Hospital's self-designed scale, with scores ranging from 0 to 100 points. The higher the scores, the higher the comfort and satisfaction. Physiological comfort included: physical sensation, ward environment, temperature, humidity, bedding, clothing, diet, quietness, recreational conditions, ward equipment; patient satisfaction included nursing staff attitude, nursing operation, communication, prevention measures of pressure ulcers, related examination preparation, environmental care, massage protection, patrol, education content, and self-care supervision. (3) Mental state was assessed using the Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS) [14], Hamilton Anxiety Scale (HAMA), and Hamilton Depression Scale (HAMD) [15]. The SAS score ≥ 50 suggested the presence of anxiety, with higher scores indicating more severe anxiety; the SDS score ≥ 53 suggested the presence of depression, with higher scores indicating more severe depression; the HAMA score ≥ 7 suggested the presence of anxiety, with higher scores indicating more severe anxiety; the HAMD score ≥ 7 suggested the presence of depression, with higher scores indicating more severe depression. (4) The quality of life was assessed by the Quality of Life Scale developed by the World Health Organization (WHO), with higher scores indicating a better quality of life [16]. (5) The risk of pressure ulcers occurrence was assessed by Braden score [17]. The Braden score consisted of six sub-items: sensory strength, wetness, mobility, locomotivity, nutrition, and shear friction, each scoring 1 to 4, with higher scores indicating a lower risk of pressure ulcers occurrence.

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Table 1. Comparison of general data

Group	n	gender		age	primary disease		
		male	female		respiratory failure	severe infection	multiple organ failure
Control group	103	58	45	74.36±5.97	32	49	22
Observation group	103	56	47	74.61±6.02	33	47	23
Z/x ²		0.079		0.299	0.086		
P		0.779		0.765	0.678		

Table 2. Comparison of the incidence and severity of pressure ulcers between the two groups [n (%)]

Group	n	I	II	III	IV	Total
Control group	103	12 (11.65)	14 (13.59)	9 (8.74)	6 (5.83)	41 (39.81)
Observation group	103	3 (2.91)	6 (5.83)	3 (2.91)	0 (0)	12 (11.65)
Z/x ²				-4.618		21.365
P				0.000		0.000

Table 3. Comparison of formation time of pressure ulcers and patient satisfaction between the two groups (x±sd)

Group	n	Formation time of pressure ulcers	Patient satisfaction
Control group	103	10.81±3.56	76.67±6.53
Observation group	103	4.53±2.81	91.14±7.92
t		14.053	14.307
P		0.000	0.000

ulcers was lighter than that in the control group ($P < 0.05$, **Table 2**).

Formation time of pressure ulcers and patient satisfaction

The formation time of pressure ulcers was shorter in the observation group than that in the control group, and the patient satisfaction score was higher than that in the control group ($P < 0.05$, **Table 3**).

Statistical analysis

The data were analyzed using SPSS 21.0 software. Measurement data were detected by t-test and expressed as mean ± standard deviation (x±sd); numeration data were detected by chi-square test, and ranking data were detected by rank-sum test and expressed as n (%). $P < 0.05$ was considered statistically significant.

Results

Comparison of general data

No noticeable difference was observed in age, gender and primary disease between the two groups. See **Table 1**.

Severity of pressure ulcers

The incidence of pressure ulcers was 11.65% in the observation group and 39.81% in the control group, the incidence of pressure ulcers in the observation group was lower than that in the control group, and the severity of pressure

Braden score of the risk of pressure ulcers occurrence

Each sub-item of the Braden score for the risk of pressure ulcers occurrence in patients in the observation group was lower compared with the control group ($P < 0.05$, **Table 4**).

Psychological state

There was no significant difference in the psychological state scores before nursing between the two groups ($P > 0.05$); the scores of SAS, SDS, HAMA and HAMD after nursing were decreased compared with those before nursing in this group ($P < 0.05$), and the scores in the observation group were lower than those in the control group ($P < 0.05$, **Tables 5, 6**).

Physiological comfort and quality of life

There were no significant differences in the physiological comfort and quality of life scores before nursing between the two groups ($P > 0.05$); the physiological comfort and quality

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Table 4. Comparison of Braden scores for the risk of pressure ulcers occurrence after the nursing between the two groups ($x \pm sd$, points)

Group	n	Sensory strength	Mobility	Wetness	Locomotivity	Nutrition	Shear friction
Control group	103	2.51±0.96	2.17±0.52	1.67±0.49	2.36±0.52	2.13±0.08	2.45±0.17
Observation group	103	3.43±1.05	3.38±0.63	3.09±0.61	3.38±0.64	3.49±0.13	3.71±0.59
<i>t</i>		6.563	15.033	18.419	12.553	90.423	20.827
<i>P</i>		0.000	0.000	0.000	0.000	0.000	0.000

Table 5. Comparison of SAS and SDS scores between the two groups ($x \pm sd$, points)

Group	n	SAS		SDS	
		before intervention	after intervention	before intervention	after intervention
Control group	103	59.78±1.56	50.08±1.24	60.53±1.49	52.08±1.86
Observation group	103	59.73±1.76	47.55±1.69	60.88±1.41	48.68±1.26
<i>t</i>		0.216	12.250	1.732	15.359
<i>P</i>		0.829	<0.001	0.085	<0.001

Table 6. Comparison of HAMA and HAMD scores between the two groups ($x \pm sd$, points)

Group	n	HAMA		HAMD	
		before intervention	after intervention	before intervention	after intervention
Control group	103	11.15±1.16	10.20±1.32	12.47±1.07	8.15±1.30
Observation group	103	10.88±1.32	6.24±1.16	12.25±1.16	6.25±1.28
<i>t</i>		1.559	22.870	1.415	10.570
<i>P</i>		0.121	<0.001	0.159	<0.001

of life scores after nursing were increased compared with those before treatment in this group ($P < 0.05$), and the scores in the observation group were higher than those in the control group ($P < 0.05$, **Table 7**).

Discussion

Pressure ulcers are a common complication among hospitalized patients. Its formation is mainly caused by long-term compression of certain positions of the body due to the long-term maintenance of a body position by the patient, which causes poor blood circulation of the skin tissue at the compressed site under the action of pressure, and ischemia, hypoxic necrosis, ulceration, metabolic disorders and other lesions in the local skin [18-20]. Local and even systemic inflammatory stress responses can be induced after the formation of pressure ulcers, which not only leads to a decrease in the patient's quality of life, physical pain, and even delayed recovery from the primary disease. Severe elderly patients have a high incidence of pressure ulcers due to a combination of factors such as prolonged bed

rest due to primary severe illnesses, declining immune function, less elastic skin tissue, slower blood circulation and more chronic diseases [21-23]. Severe elderly patients and their families often have less knowledge about pressure ulcers, making it difficult for them to be proactive in preventing them, and some are less aware of the importance of preventing pressure ulcers. In the later stage or early stage of the formation of pressure ulcers, some patients may develop negative emotions such as fear, anxiety, and depression, believing that their disease has worsened, which may lead to resistance to subsequent treatment and care and adversely affect clinical treatment. Therefore, comprehensive nursing measures need to be taken to raise patients' and their families' awareness of pressure ulcers and improve their psychological state, in the hope of obtaining the active cooperation of the affected parties in the follow-up treatment and care.

At present, clinical care resources in China are relatively inadequate, and the effectiveness of routine care in the prevention and treatment of pressure ulcers is not satisfactory. Modern

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Table 7. Comparison of physiological comfort and quality of life scores between the two groups ($\bar{x}\pm s$, points)

Group	Time	Physiological comfort	Quality of life
Control group	Before nursing	38.92±9.16	32.15±8.78
	After nursing	58.97±10.38	51.26±9.85
	<i>t</i>	14.699	14.698
	<i>P</i>	0.000	0.000
Observation group	Before nursing	38.23±8.94	31.96±8.24
	After nursing	71.43±11.61	69.28±10.13
	<i>t</i>	22.995	29.005
	<i>P</i>	0.000	0.000
Before treatment	<i>t</i>	0.547	0.160
	<i>P</i>	0.585	0.873
After treatment	<i>t</i>	8.120	12.943
	<i>P</i>	0.000	0.000

nursing philosophy is patient-centered, paying emphasis on psychologically and physically improving patients' clinical symptoms and overall hospital experience. Based on modern nursing philosophy, the Second Affiliated Hospital of Wenzhou Medical University has developed comprehensive nursing measures in light of years of experience in the prevention and treatment of pressure ulcers. Through popularizing pressure ulcers, patients and their families are able to understand the causes of pressure ulcers, to avoid blind pessimism, and to appreciate the importance of preventing pressure ulcers in the treatment of primary diseases. The patients and their families are instructed to cooperate with each other for daily self-care such as turnover and cleaning, and provide soft pads, air pads, etc. to assist the patients to reduce the pressure on the compressed sites, which can not only improve the physical comfort of the patients, but also mobilize the enthusiasm of the patients to assist in improving their psychological state. It was shown that changing the body position every 2 hours and quantifying the time of changing the patient's body position with the specific time can effectively prevent the compression time of a certain site from being too long, which is an important basis for preventing the formation of pressure ulcers. All these were consistent with the previous results [17-20]. Massage and moderate activity are all important ways to improve blood circulation to the compressed sites and to the body skin. Careful application of skin care agents for patients contributes to improving the

moistness and elasticity of their skin, and the overall improvement of the skin condition has a positive effect on the prevention of the formation of pressure ulcers. Effective communication with patients and their families can correctly assess the psychological state of patients and provide targeted psychological intervention, which can effectively upgrade the improvement effect of psychological state, help patients to build up their confidence in facing the disease, make patients actively cooperate with the relevant treatment and care, thus improving the clinical effectiveness. A dietary plan was jointly developed by the doctor and patients, which can ensure that their nutritional

supplementation is on target and can increase viability, making it easier for patients and their families to adhere.

This study showed that the observation group had lower incidence of pressure ulcers, severity of pressure ulcers and Braden scores compared with the control group, which suggested that comprehensive nursing measures could effectively reduce the risk of pressure ulcers occurrence in critically ill elderly patients and clearly reduce the severity of pressure ulcers. Before nursing, the psychological state, physical comfort and quality of life scores in the two groups were at the same baseline level. After nursing, the two groups were improved compared with those before treatment, but the observation group was superior to the control group, which suggested that comprehensive nursing could more effectively improve the psychological state of elderly patients and upgrade the physical comfort and quality of life of patients during hospitalization. Compared with the control group, the observation group had shorter formation time of pressure ulcers, and higher satisfaction score, suggesting that the comprehensive nursing measures could detect the patient's formation as early as possible, which was of great significance for timely treatment and reducing the severity of pressure ulcers. Therefore, it could effectively improve the overall satisfaction of the patients for the clinical nursing work. Although the study conducted a thorough survey, there were certain limitations while exploring the aim of the study.

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For example, there was no research done on the subject matter, and it may impact the interpretation of the findings. Moreover, this study was based on a relatively smaller sample size and that may not generate much accurate results compared to a larger one.

In summary, comprehensive nursing measures can effectively reduce the risk of pressure ulcers occurrence in severe elderly patients, reduce the severity of pressure ulcers, raise their psychological state and quality of life, and improve their physical comfort during hospitalization.

Disclosure of conflict of interest

None.

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