

Original Article

Comfort nursing can alleviate pain and negative emotion of patients after surgery for LVCFs and improve their living ability

Hong Qian^{1*}, Jingfen Zhou^{2*}, Tingmin Huang¹, Xingye Cao¹, Chao Zhou¹, Minjuan Yang¹, Yan Chen³

¹Department of Orthopaedics, Affiliated Hospital of Jiangnan University, Wuxi 214125, Jiangsu Province, China; ²Department of Hematology, Affiliated Hospital of Jiangnan University, Wuxi 214125, Jiangsu Province, China; ³Department of Nephrology, Affiliated Hospital of Jiangnan University, Wuxi 214125, Jiangsu Province, China. *Equal contributors and co-first authors.

Received November 23, 2020; Accepted December 24, 2020; Epub April 15, 2021; Published April 30, 2021

Abstract: Objective: To determine the effect of comfort nursing in elderly patients with lumbar vertebral compression fractures (LVCFs). Methods: A total of 194 elderly patients with LVCFs were enrolled, and assigned to two groups based on different nursing intervention methods. Among them, 93 patients were given routine nursing intervention as a control group (CON group), while the rest 101 patients were given comfort nursing as an intervention group (INT group). The visual analog scale (VAS) was adopted to evaluate patients' pain and Japanese Orthopaedic Association score (JOA) to evaluate their dysfunction. In addition, Barthel score was used to evaluate patients' self-care ability, and the self-rating anxiety scale (SAS) and self-rating depression scale (SDS) were adopted to score their anxiety and depression. Moreover, the compliance and nursing satisfaction of the two groups were investigated. Results: After nursing, VAS, SAS, and SDS scores of both groups declined significantly, and these scores of the INT group declined more notably. After nursing, the JOA and Barthel scores of the two groups increased greatly, and both scores of the INT group were significantly higher than those of the CON group. Additionally, the INT group consumed significantly less analgesic drugs and experienced significantly shorter hospital stay than the CON group. Moreover, according to the survey on nursing compliance and nursing satisfaction, the INT group showed significantly higher nursing compliance and nursing satisfaction than the CON group. Conclusion: For elderly patients with LVCFs, comfort nursing can effectively relieve their postoperative pain and negative emotion and improve their daily living ability.

Keywords: Comfort nursing, elderly patients, lumbar vertebral compression fractures, postoperative pain, negative emotion, living ability

Introduction

Lumbar vertebral compression fracture (LVCF), referred to as fracture of lumbar vertebra, is a common disease of spinal fracture in the elderly [1]. The elderly are often accompanied by osteoporosis, which increases their bone fragility, so daily muscle tension and direct violent trauma can give rise to lumbar vertebral compression fractures (LVCFs) [2]. Due to the special injury part, LVCFs are mainly manifested as subcutaneous ecchymosis and waist pain, which seriously compromises the daily living ability and physical and mental health of patients [3]. In clinical practice, the disease is primarily treated by surgical operations such as

percutaneous vertebroplasty, but after such operations, patients often suffer severe pain, which not only delays their postoperative recovery, but also increases their psychological burden [4]. In addition, the elderly have poor physical basic ability and decline of various body functions, and usually suffer from complications of various degrees, such as diabetes and hypertension, so their tolerance to surgery is poor, which also hinders their recovery after surgery [5]. Therefore, it is of great significance to take effective nursing intervention for patients with LVCFs after surgery.

Nowadays, as the society advances, the clinical practice calls for increasingly specialized nurs-

ing [6]. Ordinary nursing mode is difficult to meet the needs of patients, so it is imperative to carry out more clinical targeted nursing intervention for patients [7]. Comfort nursing is a patient-centered nursing mode, under which corresponding nursing intervention schemes are formulated for patients according to their diseases, and targeted comfort nursing is taken for the good of patients' physical and mental health to promote their recovery [8]. One study by Hou et al. [9] surveyed nurse practitioners and hospitalized patients in terms of their knowledge and attitude about comfort nursing, and the highest and lowest scores of knowledge about comfort nursing were found in intensive care units and the oncology department, respectively. As the results show, nurses in different departments and for different diseases have different understanding on comfort nursing, and achieve different application effects of it. One study by Krinsky et al. [10] holds the opinion that the theory of comfort nursing has great benefits for patients with heart diseases. Although the clinical application of comfort nursing has been widely reported [11, 12], the application of comfort nursing in elderly patients with LVCFs after surgery is rarely studied, and whether it can promote the rehabilitation of patients is still under investigation.

In this study, we intervened with elderly patients with LVCFs through comfort nursing to determine the effect of this nursing mode in such patients.

Materials and methods

General materials

A total of 194 elderly patients with LVCFs who underwent surgery in Affiliated Hospital of Jiangnan University from January 2018 to November 2019 were selected. The inclusion criteria of the study: Patients meeting the diagnostic criteria of LVCFs according to imaging examination [13], patients who signed informed consent forms after understanding the study, patients ≥ 60 years old, and those with detailed general clinical data. This study was approved by the ethics committee of our hospital. The exclusion criteria of the study: Patients with contraindications to surgery on LVCFs, and those with comorbid cardiovascular diseases,

severe organ disease, coagulation dysfunction, cognitive dysfunction, or malignant tumor.

Grouping and nursing methods

A total of 194 elderly patients with LVCFs were enrolled, and assigned to two groups based on different nursing intervention methods. Among them, 93 patients were given routine nursing intervention as a control group (CON group), while the rest 101 were given comfort nursing as an INT group. Routine nursing methods: During nursing, the nursing staff were arranged to make regular rounds of the wards to closely monitor each patient's vital signs, and timely contact the attending doctor to deal with any abnormal situation. Additionally, the staff were required to maintain the environmental sanitation of the wards, so they made effects to avoid dust on the desktops, keep the sheets clean and tidy, regularly ventilate the wards and keep their humidity and temperature proper. Comfort nursing was as follows: Psychological intervention: The nursing staff were required to pay attention to the emotional changes of each patient after his/her admission, communicate with the patient in time and provide psychological counseling to eliminate negative psychological effects on the patient, and establish a good nurse-patient relationship. Additionally, the staff were arranged to popularize health-related knowledge about the disease to the patients, including correct treatment of postoperative pain symptoms and postoperative precautions, to improve the patients' cognitive level of disease and reduce their psychological burden. Moreover, the staff were required to create a favorable postoperative recovery environment for patients to benefit their recovery. Diet nursing: The nursing staff were required to strengthen the guidance of diet nursing for the patients after their admission, so that the patients can keep correct eating habits. The nursing staff were also required to instruct the patients in eating light foods, including liquid and crude fiber foods, and firmly avoiding spicy, cold, or greasy foods and other irritating foods. In daily life, the patients were required to eat more fruits and vegetables, and sesame paste foods, which would help promote their gastrointestinal peristalsis. During eating, patients were told to eat several small meals slowly and drink more warm water. Posture nursing: The nursing staff were required to ask each patient

to take a rest by lying on his/her back, with affected limb padded, under the premise of ensuring that the patient's spine was in a horizontal position. The patient was asked to keep gentle movements while lying on side or turning over to avoid pain caused by improper body position and to ensure the comfort body position. Guidance and nursing after surgery: The staff were arranged to instruct each patient to transfer pain through abdominal breathing. During the transfer process, the patient's abdomen expanded outward after inhalation, and contracted inward to the maximum extent. The patient was required to take such breathing according to the actual situation for once a day and no more than 15 min each time. The staff were arranged to massage the patient's abdomen when appropriate. The patient was massaged, with his/her navel as the center, for no more than 30 minutes. During the massage, the staff were required to observe whether the patient has bowel sounds and observe his/her exhaust status after the massage.

Observation indexes

We adopted the visual analog scale (VAS) to evaluate the pain of each patient before surgery and at 3 d after surgery [14]. A movable 10-cm scale was adopted, which was divided into 10 scales. The scale of 0 point indicated painless, and a scale closer to the scale of 10 points indicated unbearable and severe pain. We adopted the Japanese Orthopaedic Association (JOA) score to evaluate the patients [15], which covered low back pain, leg pain and tingling, gait, Lasegue's sign, sensory disturbance, decreased muscle strength, limited daily activities and bladder function. A lower score indicates more obvious dysfunction. We also adopted the Barthel score for the evaluation of patients [16], which covered 10 items. Among the 10 items, eating, dressing, defecating, peeing, toilet use, and going up and down stairs were all given 10 points. A score of 10 points was given to a person who can complete the item independently, a score of 5 points to a person who can complete the item with help, and a score of 0 point to a person who can complete the item with great help of others or by relying entirely on others for help. Bath and grooming were both given 5 points in full. In addition, transferring bed and chair and walking on flat ground were both given 15 in full. A

score of 15 points was given to a person who can complete the item independently, a score of 10 points to a person who can complete the item with help, a score of 5 points to a person who can complete the item with great help, and a score of 0 point to a person who can complete the item by relying entirely on others for help. Higher scores indicate stronger self-care ability. Additionally, we adopted the self-rating anxiety scale (SAS) and self-rating depression scale (SDS) to evaluate the anxiety and depression of patients [17]. Each scale covered 20 items, and each item was given 0-4 points. Higher SAS and SDS scores indicate more serious anxiety and depression, respectively. We compared the compliance of the two groups according to the *Health and responsiveness of health systems* [18]. For the purpose of evaluating patients' compliance, we scored patients in their cooperation with nurses in dressing change, physical examination, regular work and rest, strict compliance with doctor's advice, active exercise and rehabilitation. A higher score indicates better compliance. Moreover, we surveyed the nursing satisfaction of each patient before his/her discharge [19]. The nursing satisfaction has a full score of 100 points, with a score >90 points for high satisfaction, a score between 60 and 90 points for satisfaction, and a score <60 for dissatisfaction. Nursing satisfaction = (The number of patients highly satisfied with nursing + that of patients satisfied with it) × 100%. We also counted the usage amount of analgesic drugs and hospital stay of patients in the two groups.

Statistical analyses

Enumeration data, expressed as [n (%)], were compared between groups using the chi-square test. Measurement data, expressed as (mean ± SD), were compared between groups using the t test, and within groups before and after nursing using the paired t test. IBM SPSS 26.0 was adopted for statistical analyses of data, and GraphPad Prism 6.0 for drawing of corresponding figures.

Results

General materials

The comparison of clinical data between the INT and CON groups showed that there was no significant difference between them in general clinical data such as sex, age, injury cause,

Nursing care of elderly patients with lumbar compression fracture

Table 1. Clinical data of the control group and the intervention group

Item	The control group (n=93)	The intervention group (n=101)	t/ χ^2	P-value
Sex			2.538	0.111
Female	40 (43.01)	60 (54.46)		
Male	53 (56.99)	41 (45.54)		
Age (Y)	67.6±3.5	68.1±3.7	0.945	0.336
Cause of injury			1.328	0.515
Injury for traffic accident	29 (31.18)	25 (24.75)		
Injury for falling	53 (56.99)	60 (59.41)		
Trauma from foreign objects	11 (11.83)	16 (15.84)		
Time from injury to admission (h)	11.4±3.2	11.9±3.9	0.971	0.333
Education level			0.972	0.808
With university diploma	38 (40.86)	37 (36.63)		
With senior diploma	41 (44.09)	51 (50.50)		
With junior diploma	11 (11.83)	11 (10.89)		
With primary school diploma	3 (3.23)	2 (1.98)		
Coronary heart disease			0.208	0.648
Yes	10 (10.75)	13 (12.87)		
No	83 (89.25)	88 (87.13)		
Hypertension			0.236	0.627
Yes	23 (24.73)	22 (21.78)		
No	70 (75.27)	79 (78.22)		
Diabetes mellitus			0.077	0.781
Yes	9 (9.68)	11 (10.89)		
No	84 (90.32)	90 (89.11)		

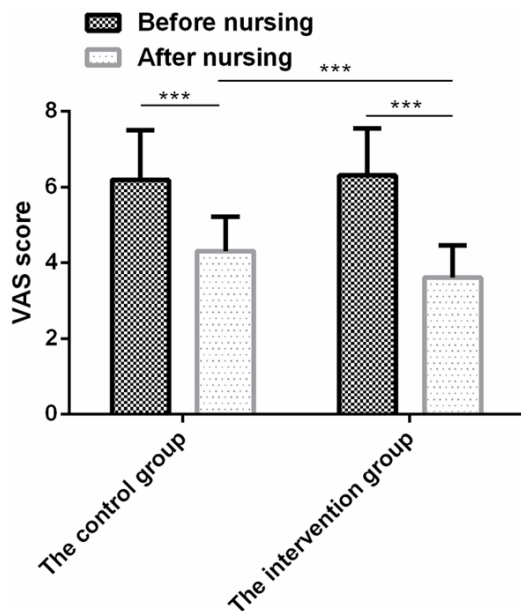


Figure 1. Comparison of VAS scores between the control group and the intervention group before and after nursing. After nursing, the VAS scores of both groups decreased notably, and the decrease in the intervention group was more significant. Note: *** indicates $P < 0.001$.

education level and complications (all $P > 0.05$) (Table 1).

VAS scores of the two groups before and after nursing

We adopted VAS scores to evaluate the pain of the two groups, finding that before nursing, there was no notable difference between the two groups in VAS score ($P > 0.05$), while after nursing, the VAS scores of both groups decreased significantly ($P < 0.001$), and the decrease in the INT group was more significant ($P < 0.001$) (Figure 1).

JOA scores of the two groups before and after nursing

We adopted JOA score to evaluate the dysfunction of the two groups, finding that before nursing, there was no significant difference between the two groups in JOA score ($P > 0.05$), while after nursing, the JOA scores of both groups increased significantly ($P < 0.001$), but the JOA score of the INT group was notably higher ($P < 0.001$) (Figure 2).

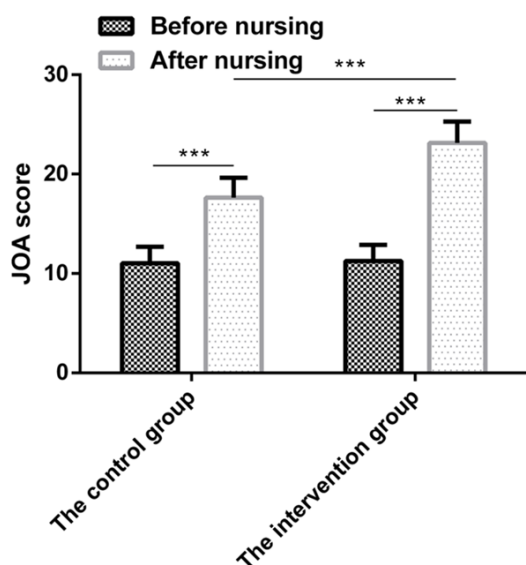


Figure 2. Comparison of JOA score between the control group and the intervention group before and after nursing. After nursing, the JOA scores of both groups increased notably, while the JOA score of the intervention group was notably higher than that of the control group. Note: *** indicates $P < 0.001$.

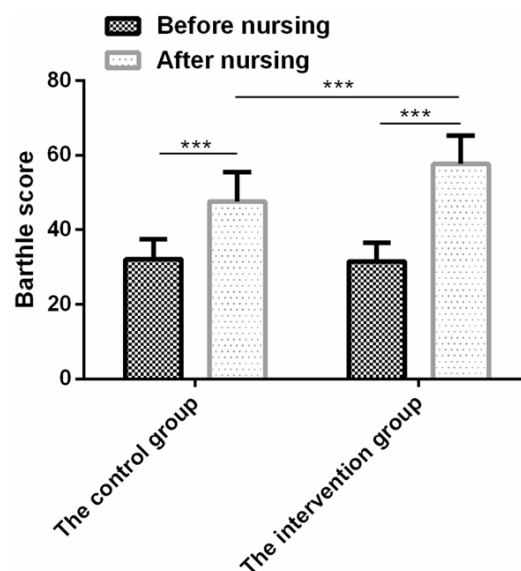


Figure 3. Comparison of Barthel score between the control group and the intervention group before and after nursing. After nursing, the Barthel scores of both groups increased notably, while the Barthel score of the intervention group was notably higher than that of the control group. Note: *** indicates $P < 0.001$.

Barthel score of the two groups before and after nursing

We adopted Barthel score to evaluate the self-living ability of the two groups before and after nursing, finding that there was no significant difference between the two groups in Barthel score ($P < 0.001$), while after nursing, the Barthel scores of both groups increased notably ($P < 0.001$), but the Barthel score of the INT group was notably higher ($P < 0.001$) (Figure 3).

Anxiety and depression scores of the two groups before and after nursing

We adopted SAS and SDS scores to evaluate the anxiety and depression of the two groups, finding that before nursing, there was no significant difference between the two groups in SAS and SDS scores (both $P > 0.05$), while after nursing, the SAS and SDS scores of both groups decreased notably (both $P < 0.001$), but the decrease in the INT group was more significant ($P < 0.001$) (Figure 4).

Usage amount of analgesic drugs after surgery and discharge time of the two groups

According to the observation of usage amount of analgesic drugs after surgery and discharge

time of the two groups, the INT group consumed less analgesic drugs and experienced shorter hospital stay than the CON group (Table 2).

Nursing compliance of the two groups

According to the observation of the nursing compliance of the two groups, the INT group showed notably higher nursing compliance than the control group (97.03% vs. 89.25%) (Table 3).

Nursing satisfaction of the two groups

We evaluated the nursing satisfaction of the two groups before their discharge and found that the nursing satisfaction of the INT group was notably higher than that of the CON group (94.06% vs. 83.87%) (Table 4).

Discussion

LVCFs show a high incidence among the elderly in clinical practice. Patients with mild LVCFs suffer dyskinesia and local pain, and those with severe LVCFs suffer spasm of the back muscles and even loss of daily activity ability, so LVCFs are extremely harmful [20]. The elderly with LVCFs face a high risk during surgery,

Nursing care of elderly patients with lumbar compression fracture

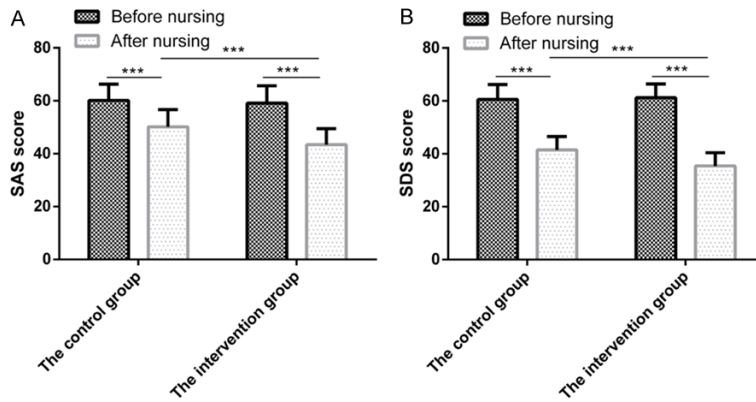


Figure 4. Comparison of SAS and SDS scores between the control group and the intervention group before and after nursing. After nursing, the SAS (A) and SDS (B) scores of both groups decreased notably, and the decrease in the intervention group was more significant than that in the control group. Note: *** indicates $P < 0.001$.

and they will suffer from obvious postoperative pain [21]. In order to ensure that postoperative rehabilitation of patients, it is imperative to carry out reasonable nursing intervention for patients.

In one report by Hertz et al. [22], there are approximate 9 million cases of fragile fractures in the elderly every year, and there is a great need for nursing care for patients with fragile fractures worldwide, so it is necessary to not only build a nursing mode to prevent fractures, but also provide an effective nursing mode to promote the recovery of patients with fragile fractures. Comfort nursing is a nursing mode with targeted nursing schemes developed for patients according to their symptoms [23]. Due to the influence of LVCs, most of patients with the disease will have severe back pain, so their physiological and self-care abilities decline, and they will inevitably suffer some bad emotions such as tension, anxiety and irritability [24]. In view of these phenomena, we carried out psychological intervention, health-related knowledge propaganda and posture nursing for patients. As a result, after comfort nursing, the VAS score of patients decreased more notably, and they consumed less usage amount of analgesic drugs and got greatly lower SAS and SDS scores. The results imply that comfort nursing can effectively control the pain of patients, reduce their postoperative stress reaction and improve their physical and mental health. In addition, the JOA score of patients intervened by comfort nursing increased significantly,

which suggested that comfort nursing can accelerate the postoperative rehabilitation of patients and improve their daily living ability. In one study, Olsson and other team members carried out nursing intervention within an integrated care pathway for patients with hip fractures, and found that such intervention can promote the recovery of patients and avoid them from deviating from the nursing plan [25]. In our research, patients showed notably higher compliance after comfort nursing. Therefore, with a corresponding nursing scheme, the pa-

tients can be effectively intervened. It may be due to the fact that comfort nursing is an effective, individualized, innovative nursing mode [26]. Through nursing intervention in various aspects, we can help patients reach a positive state in society, physiology and psychology and greatly reduce their unhappiness, thus promoting their physical recovery. Neuman and other team members have reported that the survival and prognosis of patients with hip fracture are poor, especially elderly patients and those with various complications and advanced cognitive impairment, so appropriate nursing plans should be provided for these individuals [27]. Some of the elderly cases enrolled were accompanied by some complications. After comfort nursing, they can get discharge earlier and spend less money. We surveyed the nursing satisfaction of the two groups at their discharge, finding that patients were generally satisfied with the comfort nursing mode, which was helpful to popularize and apply it in clinical practice.

Our study has confirmed the application prospect of comfort nursing intervention in elderly patients with LVCs. However, the study still has some limitations. For example, we have not carried out nursing intervention guidance for patients after discharge, and the application prospect of comfort nursing in other diseases is still to be studied. These limitations need to be addressed in future research.

To sum up, for elderly patients with LVCs, comfort nursing can effectively relieve their postop-

Nursing care of elderly patients with lumbar compression fracture

Table 2. Comparison of usage amount of analgesic drugs after surgery and discharge time between the two groups

	The control group (n=93)	The intervention group (n=101)	t	P-value
Usage amount of analgesic drugs	29.45±5.14	23.71±4.26	8.494	<0.001
Hospital stay	7.46±1.86	6.13±1.56	5.411	<0.001

Table 3. Comparison of nursing compliance between the two groups

Nursing compliance	The control group (n=93)	The intervention group (n=101)	χ^2	P-value
Complete compliance	42 (45.16)	46 (45.54)	-	-
Partial compliance	41 (44.09)	52 (51.49)	-	-
Non-compliance	10 (10.75)	3 (2.97)	-	-
Overall compliance rate (%)	89.25	97.03	4.690	0.030

Table 4. Comparison of nursing satisfaction between the two groups

Nursing satisfaction	The control group (n=93)	The intervention group (n=101)	χ^2	P-value
High satisfaction	31 (33.33)	65 (64.36)	-	-
Satisfaction	47 (50.54)	30 (29.70)	-	-
Dissatisfaction	15 (16.13)	6 (5.94)	-	-
Treatment satisfaction	83.87	94.06	5.207	0.022

erative pain and negative emotion and improve their daily living ability.

Disclosure of conflict of interest

None.

Address correspondence to: Yan Chen, Department of Nephrology, Affiliated Hospital of Jiangnan University, 1000 Hefeng Road, Wuxi 214125, Jiangsu Province, China. Tel: +86-15301517312; E-mail: chenyan20202020@126.com

References

- [1] Chen YC, Zhang L, Li EN, Ding LX, Zhang GA, Hou Y and Yuan W. Unilateral versus bilateral percutaneous vertebroplasty for osteoporotic vertebral compression fractures in elderly patients: a meta-analysis. *Medicine (Baltimore)* 2019; 98: e14317.
- [2] Lee DG, Park CK and Lee DC. Clinical and radiological comparison of 2 level anterior lumbar interbody fusion with posterolateral fusion and percutaneous pedicle screw in elderly patients with osteoporosis. *Medicine (Baltimore)* 2020; 99: e19205.
- [3] Choi SH, Kim DY, Koo JW, Lee SG, Jeong SY and Kang CN. Incidence and management trends of osteoporotic vertebral compression fractures in south korea: a nationwide population-based study. *Asian Spine J* 2020; 14: 220-228.
- [4] Yuan L, Bai J, Geng C, Han G, Xu W, Zhang Z, Luo H and Zhu X. Comparison of targeted percutaneous vertebroplasty and traditional percutaneous vertebroplasty for the treatment of osteoporotic vertebral compression fractures in the elderly. *J Orthop Surg Res* 2020; 15: 359.
- [5] Zhang HX, Shen Y, Chen J, Zhang L and Lin W. Risk factors of pulmonary complications after minimally invasive surgery for elderly patients with vertebral compression fractures. *Ther Clin Risk Manag* 2020; 16: 7-15.
- [6] Mitrea N, Ancuta C, Malloy P and Mosoiu D. Developing, promoting, and sustaining palliative care across central Eastern Europe: educating nurses to be leaders is a critical first step. *J Hosp Palliat Nurs* 2019; 21: 510-517.
- [7] Booth S, Silvester S and Todd C. Breathlessness in cancer and chronic obstructive pulmonary disease: using a qualitative approach to describe the experience of patients and carers. *Palliat Support Care* 2003; 1: 337-344.
- [8] Simes T, Roy S, O'Neill B, Ryan C, Lapkin S and Curtis E. Moving nurse educators towards transcendence in simulation comfort. *Nurse Educ Pract* 2018; 28: 218-223.
- [9] Hou YF, Zhao AP, Feng YX, Cui XN, Wang LL and Wang LX. Nurses' knowledge and attitudes on comfort nursing care for hospitalized patients. *Int J Nurs Pract* 2014; 20: 573-578.
- [10] Krinsky R, Murillo I and Johnson J. A practical application of Katharine Kolcaba's comfort theory to cardiac patients. *Appl Nurs Res* 2014; 27: 147-150.
- [11] Marchuk A. End-of-life care in the neonatal intensive care unit: applying comfort theory. *Int J Palliat Nurs* 2016; 22: 317-323.
- [12] Kolcaba K and Wilson L. Comfort care: a framework for perianesthesia nursing. *J Peri-*

Nursing care of elderly patients with lumbar compression fracture

- anesth Nurs 2002; 17: 102-111; quiz 111-103.
- [13] Kunitoki K, Mutoh T, Tatewaki Y, Takano Y, Yamamoto S, Shimomura H, Nakagawa M, Arai H and Taki Y. Clinical utility of a semiquantitative method using lumbar radiography as a screening tool for osteoporosis in elderly subjects. *Med Sci Monit* 2019; 25: 6928-6934.
- [14] Ozsoy KM, Oktay K, Gezeran Y, Cetinalp NE, Okten AI and Erman T. Percutaneous vertebroplasty for the treatment of osteoporotic thoracolumbar fractures with posterior body involved in elderly patients. *Turk Neurosurg* 2019; 29: 90-94.
- [15] Huang J, Zhou L, Yan Z, Zhou Z and Gou X. Effect of manual reduction and indirect decompression on thoracolumbar burst fracture: a comparison study. *J Orthop Surg Res* 2020; 15: 532.
- [16] Rayegani SM, Raeissadat SA, Alikhani E, Bayat M, Bahrami MH and Karimzadeh A. Evaluation of complete functional status of patients with stroke by Functional Independence Measure scale on admission, discharge, and six months poststroke. *Iran J Neurol* 2016; 15: 202-208.
- [17] Fan D, Han L, Qu W, Tian S, Li Z, Zhang W, Xu L, Gao H and Zhang N. Comprehensive nursing based on feedforward control and postoperative FMA and SF-36 levels in femoral intertrochanteric fracture. *J Musculoskelet Neuronal Interact* 2019; 19: 516-520.
- [18] Rashidian A, Kavosi Z, Majdzadeh R, Pourreza A, Pourmalek F, Arab M and Mohammad K. Assessing health system responsiveness: a household survey in 17th district of tehran. *Iran Red Crescent Med J* 2011; 13: 302-308.
- [19] Wong CA, Cummings GG and Ducharme L. The relationship between nursing leadership and patient outcomes: a systematic review update. *J Nurs Manag* 2013; 21: 709-724.
- [20] Hu W, Wang H, Shi X, Song Y, Zhang G, Xing S, Zhang K and Gao Y. Effect of preoperative zoledronic acid administration on pain intensity after percutaneous vertebroplasty for osteoporotic vertebral compression fractures. *Pain Res Manag* 2020; 2020: 8039671.
- [21] Feng F, Zhong X, Luo L, Shang C, Huang L and Cheng Z. Clinical observation of percutaneous vertebroplasty in the treatment of osteoporotic vertebral compression fracture. *J Pak Med Assoc* 2020; 70 [Special Issue]: 84-87.
- [22] Santy-Tomlinson J, Hertz K and Kaminska M. Orthogeriatric Nursing. In: Hertz K, Santy-Tomlinson J, editors. *Fragility Fracture Nursing: Holistic Care and Management of the Orthogeriatric Patient*. Cham (CH); 2018. pp. 147-154.
- [23] Fleishman R, Zhou C, Gleason C, Larison C, Myaing MT and Mangione-Smith R. Standardizing morphine use for ventilated preterm neonates with a nursing-driven comfort protocol. *J Perinatol* 2015; 35: 46-51.
- [24] Kuvacic G, Fratini P, Padulo J, Antonio DI and De Giorgio A. Effectiveness of yoga and educational intervention on disability, anxiety, depression, and pain in people with CLBP: a randomized controlled trial. *Complement Ther Clin Pract* 2018; 31: 262-267.
- [25] Olsson LE, Karlsson J and Ekman I. Effects of nursing interventions within an integrated care pathway for patients with hip fracture. *J Adv Nurs* 2007; 58: 116-125.
- [26] March A and McCormack D. Nursing theory-directed healthcare: modifying Kolcaba's comfort theory as an institution-wide approach. *Holist Nurs Pract* 2009; 23: 75-80; quiz 81-72.
- [27] Neuman MD, Silber JH, Magaziner JS, Passarella MA, Mehta S and Werner RM. Survival and functional outcomes after hip fracture among nursing home residents. *JAMA Intern Med* 2014; 174: 1273-1280.