

Original Article

Application value of evidence-based nursing and its effect on functional recovery and complications in patients with spinal fracture

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Abstract: Objective: To explore the application value of evidence-based nursing model and its impact on functional recovery and complications in patients with spinal fractures and to provide a better-quality nursing model for clinical treatment. Methods: A total of 150 patients with spinal fractures who underwent orthopedic surgery were retrospectively analyzed. 70 Patients were treated with routine nursing methods (control group), while 80 patients were treated with evidence-based nursing in addition to routine nursing (observation group). The Self-rating Depression Scale (SDS), Self-rating Anxiety Scale (SAS) and Oswestry Dysfunction Index (ODI) scores of the two groups were measured. The total incidence of complications and the quality of life (QOL) questionnaire score were recorded. Results: The decrease of SAS and SDS scale scores in the observation group after evidence-based nursing was significantly higher than that in the control group ($P<0.05$). After evidence-based nursing, the decrease in ODI index in the observation group was significantly higher than that in the control group ($P<0.05$). The QOL scores of the two groups significantly improved after nursing care ($P<0.05$), with the QOL score of the observation group being significantly higher than that of the control group ($P<0.05$). There was a statistically significant difference in the overall incidence of complications between the two groups ($\chi^2=2.237$, $P=0.025$). The degree of patient satisfaction of the observation group was significantly higher than that of the control group ($P<0.05$). Conclusion: The evidence-based nursing model can accelerate the functional recovery of patients with spinal fractures, reduce the incidence of complications, effectively prevent negative emotions, and improve the quality of life of patients.

Keywords: Evidence-based nursing, spinal fracture, self-rating anxiety scale, self-rating depression scale, quality of life

Introduction

Spinal fracture, a common trauma requiring orthopedic surgery, is mainly caused by indirect external force and the injury occurs most predominantly in the thoracolumbar region [1]. Spinal fractures account for 5% to 6% of fractures, with reports of a gradually increasing trend in the incidence rate and more commonly occurring in young adult men [2, 3]. The clinical manifestations of spinal fractures include pain, spinal deformity, combined spinal cord injury, etc., which can cause paralysis and may even be life-threatening [4]. Currently, surgical treatment is the most common and effective clinical method for the treatment of spinal fractures. Because of the slow recovery after surgery for patients with spinal fractures, improper nursing

care can lead to prolonged recovery time and various complications [1]. Therefore, the present study aimed to adopt an effective nursing model to provide patients with comprehensive care to meet their treatment needs.

Evidence-based nursing, also known as empirical nursing, refers to the process of careful, clear, and wisely combining scientific research conclusions with clinical experience and patient wishes in the process of planning nursing activities to obtain evidence as a basis for clinical nursing decision-making [5, 6]. The Canadian scholar Guyatt first used the term "evidence-based medicine" to refer to the continuous improvement and organization of evidence-based medical terminology; however, evidence-based medicine is not limited to the field of

medicine but also forms a new evidence-based decision-making concept in the field of nursing. [7]. Evidence-based nursing is a concept of nursing that is produced under the influence of evidence-based medicine. In recent years, the concept of evidence-based nursing has gradually gained prominence in the field of nursing. Evidence-based nursing has provided the empirical basis for clinical nursing decisions regarding pressure sores [8]. In another study, evidence-based nursing practice successfully explored the best management method for chest pain.

Therefore, in order to improve the therapeutic effect and quality of life for patients, this study used evidence-based nursing to assess its influence and clinical value on functional recovery and complications of patients with spinal fracture.

Materials and methods

A total of 150 patients with spinal fractures who underwent orthopedic surgery between April 2014 and October 2017 were included in this retrospective analysis. The patients were divided into control and observation groups according to the nursing methods. Among them, there were 70 patients in the control group, including 48 males and 22 females ranging in age from 35 to 70 years with an average age of 48.84 ± 5.62 years, while the observation group contained 80 patients, including 61 males and 19 females ranging in age from 40 to 72 years with an average age of 50.15 ± 6.22 years. The control group patients received routine nursing methods, while the observation group patients received evidence-based nursing care based on routine nursing. This study was approved by the medical ethics committee of the hospital.

Inclusion and exclusion criteria

Inclusion criteria: (1) complete patient clinical data. (2) Patients diagnosed with a spinal fracture by relevant auxiliary examination. (3) Patients with no mental disorder. (4) Patients and their family who agreed and signed the informed consent form.

Exclusion criteria: (1) Patients with poor physical fitness who could not tolerate surgery. (2) Patients with contraindications to anesthesia. (3) Patients with other locomotor diseases. (4)

Issues with patient hearing, visual acuity, and language communication.

Methods

Patients in the control group received routine nursing interventions, including: (1) close monitoring of the vital signs and fracture complications and administration of oxygen inhalation and infusion according to the doctor's advice. (2) Instructing the patients to use a hard bed and to undergo complete bed rest for 4-6 weeks. (3) Closely observing the patient's color and symptoms and the amount of fluid drainage. (4) Instructing the patients to breathe effectively and to cough up phlegm, encouraging them to breathe autonomously, and providing atomized inhalation devices if necessary. (5) Keeping the sheets and bedding clean, changing wet bedding in a timely manner, and taking good care in the morning and evening. (6) Instructing patients to actively cooperate with post-rehabilitation treatment and to maintain an optimistic attitude regarding treatment.

The observation group received evidence-based nursing interventions based on routine nursing. The prerequisites for evidence-based nursing interventions were: (1) A special evidence-based nursing team with experienced head nurses as group leaders of 4-8 nursing staff to perform comprehensive nursing. (2) The nursing team provided support for evidence-based problems based on their own work experience and existing research results and formulated corresponding nursing plans according to the actual situation of patients. (3) The main evidence-based problems included psychological intervention and pressure ulcer, and urinary tract infection, and lower limb vein thrombosis care.

The adopted nursing plans were as follows: (1) **Psychological nursing:** The patients could not bear burden of the severe consequences of spinal fracture, such as physical inconvenience and paraplegia, and often experienced negative emotions such as anxiety, depression, irritability, and sorrow. In severe cases, patients considered giving up treatment. In order to prevent patients from experiencing the above negative emotions, the nurses took the initiative to care for the patients, encouraging them to maintain a healthy mentality to face the disease, recount previous cases of successful sur-

gery, and help patients establish confidence in their treatment. At the same time, the patients were provided assistance with tasks of everyday living. Fracture patients often cannot complete basic daily tasks by themselves because of the restricted movement; therefore, nursing staff should help them to take medicine, eat, drink water, etc., so that the patients feel taken care of. For patients worried about their prognosis, nurses should provide relevant knowledge and assurance that rehabilitation therapy will be of great help to the prognosis of the disease. (2) Nursing of pressure ulcer: Patients with spinal fractures are prone to neurological damage, which leads to somatosensory dysfunction and requires long-term complete bed rest, which can lead to development of pressure sores if the nursing is not appropriate. As the most common complication in patients with spinal fracture, pressure ulcers can be painful and reduce the quality of nursing. In this regard, the nursing staff should regularly turn patients who cannot turn on their own and also ask their family members to actively participate; the nursing staff should pay close attention to observe the temperature and color of the patient's stressed skin, and provide appropriate local massage to promote blood circulation; timely replace wet bedding to keep the bedding dry and clean; place softer pillows on the stressed areas to reduce local stress and friction; and instruct patients to eat high-protein and high-calorie foods. For patients with pressure ulcers, 75% alcohol can be used for local application and infrared light for irradiating the pressure sores; the skin should be kept dry. (3) Nursing care for urinary tract infections: Patients who have been in bed for a long time require catheterization and prolonged indwelling catheterization may cause urinary tract infections. Therefore, patients should be encouraged to drink sufficient water and the pH of the urine should be closely monitored, urethra care should be performed twice daily, and the catheter should be replaced regularly to prevent urinary tract infection. (4) Nursing of deep vein thrombosis of the lower limbs: Long-term bed rest, combined with sensory motor dysfunction caused by neurological damage, increases the incidence of venous thrombosis. Patients should be instructed to wear elastic pants and should be encouraged to perform leg lifts and knee flexions. For patients who

cannot perform these tasks independently, family members can be provide assistance; and patients can be provided appropriate amounts of anticoagulant drugs according to the doctor's recommendations.

Observation index

Main observation indicators: The Self-rating Depression Scale (SDS), Self-rating Anxiety Scale (SAS), and Oswestry Dysfunction Index (ODI) scores were recorded 6 months before and after care for the two groups. The scores of the Self-rating Depression Scale (SDS) and Self-rating Anxiety Scale (SAS) are 100 points. The Self-Rating Depression Scale (SDS) is a 20-item self-report questionnaire that is widely used as a screening tool, covering affective, psychological and somatic symptoms associated with depression. The questionnaire takes about 10 minutes to complete, and items are framed in terms of positive and negative statements. It can be effectively used in a variety of settings, including primary care, psychiatric, drug trials and various research situations. The scores provide indicative ranges for depression severity that can be useful for clinical and research purposes. The scale also provides a simple tool for monitoring changes in depression severity over time in research studies. The Self-rating Anxiety Scale (SAS) is a 20-item self-report assessment device built to measure anxiety levels, based on scoring in 4 groups of manifestations: cognitive, autonomic, motor and central nervous system symptoms. Answering the statements a person should indicate how much each statement applies to him or her within a period of one or two weeks prior to taking the test. Each question is scored on a Likert-type scale of 1-4 (based on these replies: "a little of the time," "some of the time," "good part of the time," "most of the time"). Some questions are negatively worded to avoid the problem of set response. Overall assessment is done by total score. The higher the score. The more serious the anxiety and depression of the patients; Oswestry Dysfunction Index value is 0 to 50 points, ODI index = score/total score X100%, the total score is 0-100 points, the higher the ODI index, the worse the patient's spine function, and the follow-up after 6 months is by phone or The patient's outpatient review is evaluated for

Table 1. Comparisons of clinical data [n (%)]

Factor	Control group (n=70)	Observation group (n=80)	t/X ² value	P value
Sex			1.108	0.293
Man	48 (68.57)	61 (76.25)		
Woman	22 (31.43)	19 (23.75)		
Age (years)	48.84±5.62	50.15±6.22	1.346	0.180
BMI (kg/m ²)	22.84±2.15	23.15±1.84	0.952	0.343
Smoking history			2.013	0.156
Yes	50 (71.43)	65 (81.25)		
No	20 (28.57)	15 (18.75)		
History of alcoholism			0.741	0.390
Yes	15 (21.43)	22 (27.50)		
No	55 (78.57)	58 (72.50)		
History of hypertension			0.325	0.569
Yes	40 (57.14)	42 (52.50)		
No	30 (42.86)	38 (47.50)		
Diabetes history			1.241	0.265
Yes	33 (47.14)	45 (56.25)		
No	37 (52.86)	35 (43.75)		
Domicile			0.608	0.436
Village	22 (31.43)	30 (37.50)		
City	48 (68.57)	50 (62.50)		
Degree of education			1.075	0.300
>Senior middle school	37 (52.86)	49 (61.25)		
≤Senior middle school	33 (47.14)	31 (38.75)		

each score. The total incidence of complications such as pressure sores, urinary tract infections, and deep venous thrombosis of the lower extremities were also recorded.

Secondary observation indicators: The quality of life (QOL) questionnaire, hospitalization time, and medical expenses of the two groups were recorded and compared. There were three levels of nursing satisfaction scores: very satisfied, satisfied, and not satisfied; Percent satisfaction = (very satisfied number + satisfied number)/total number * 100%.

Statistical analysis

In this study, the collected data were statistically analyzed using IBM SPSS Statistics for Windows, version 20.0 and the data and figures were plotted using GraphPad Prism 7, in which the count data were expressed as "rate (%)" and were analyzed by chi-square tests. The measurement data were expressed as mean ± standard deviation (means ± SD) and were ana-

lyzed by t-tests. A statistically significant difference was defined as P<0.05.

Results

Clinical data analysis of two groups of patients

There was no statistical difference in the clinical data of the observation and control groups (P>0.05), as shown in **Table 1**.

SAS and SDS scale scores before and after nursing

Comparison of the SAS and SDS scale scores of the two groups of patients showed no significant difference in scores between the observation and control groups before nursing (P>0.05). After nursing, the scores in both groups were significantly lower than those before the nursing (P<0.05) and the decrease in SAS and SDS scale scores in the observation group after evidence-based nursing was significantly higher than

that in the control group (P<0.05), as shown in **Table 2** and **Figure 1**.

Changes in ODI and QOL scores in patients before and after treatment

Analysis of the ODI questionnaires of the two groups of patients revealed no significant difference in the ODI score before nursing between the observation and control groups (P>0.05). After evidence-based nursing, the decrease in the ODI score in the observation group was significantly higher than that in the control group (P<0.05), and compared with the pre-nursing values, the ODI scores of the two groups after nursing decreased significantly (P<0.05). Comparison of the QOL scores of the two groups before and after nursing revealed no difference in the QOL score between the two groups before nursing (P>0.05). After nursing, the QOL score of the two groups was significantly improved (P<0.05) and the QOL score of the observation group treated with evidence-based nursing was significantly higher than

Table 2. SAS and SDS scores before and after nursing care

Group	SAS score		SDS score	
	Before nursing care	After nursing care	Before nursing care	After nursing care
Control group (n=70)	52.85±4.95	32.64±3.59*	52.92±5.35	30.66±4.10*
Observation group (n=80)	51.92±5.32	20.95±3.38*	53.18±5.22	19.64±4.34*
t value	1.103	20.528	0.301	15.919
P value	0.272	0.000	0.764	0.000

Note: *Statistical difference between before and after nursing ($P<0.05$).

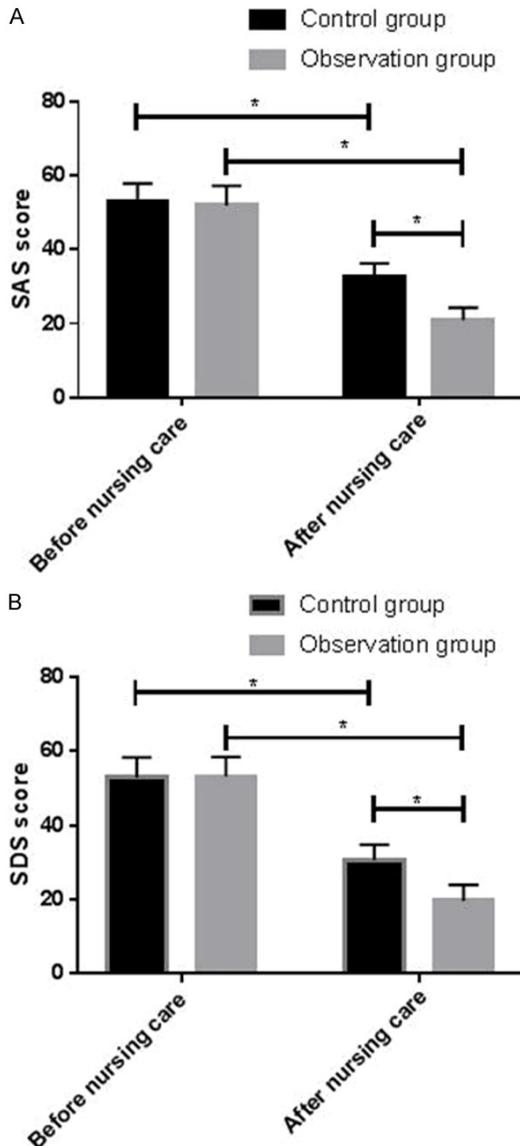


Figure 1. SAS and SDS scores. A. There was no difference in SAS scores between groups before and after nursing. The SAS scores of the two groups after nursing were significantly lower than those before nursing and the decrease in the control group was significantly lower than that of the observation group. *Significant differences between groups ($P<0.05$). B. There was no difference in SDS score between

the two groups before nursing. The SDS scores of the two groups after nursing were significantly lower than those before nursing and the decrease in the control group was significantly lower than that of the observation group. *Significant differences between groups ($P<0.05$).

that of the control group ($P<0.05$) (Table 3 and Figure 2).

Incidence of postoperative complications

The incidence of pressure sores, urinary tract infections and deep venous thrombosis of the lower extremities were compared between the two groups. In the observation group, four patients had pressure ulcers, six patients had urinary tract infections, and one patient had deep venous thrombosis of the lower extremities. In the control group, eight patients had pressure ulcers, nine patients had urinary tract infections, and three patients had deep venous thrombosis of the lower extremities. There was a statistically significant difference in the overall incidence of complications between the two groups ($X^2=2.237$, $P=0.025$) (Table 4).

Satisfaction, hospitalization time, and medical expenses

Comparison of the nursing satisfaction forms filled out by the two groups of patients revealed a significantly higher degree of patient satisfaction in the observation group compared to that of the control group ($P<0.05$). The hospitalization time of the observation group was significantly lower than that of the control group, ($P<0.05$). The medical expenses of the observation group were also significantly lower than the control group ($P<0.05$) (Tables 5 and 6).

Discussion

As one of the most common types of fractures in clinical practice, spinal fractures in the thora-

Table 3. Changes in patient ODI and QOL scores before and after nursing care

Group	ODI score		QOL score	
	Before nursing care	After nursing care	Before nursing care	After nursing care
Control group (n=70)	32.11±3.84	19.38±3.05*	4.83±1.62	7.32±1.43*
Observation group (n=80)	31.88±3.79	16.22±3.62*	4.69±1.88	8.96±1.29*
t value	0.369	5.736	0.485	7.384
P value	0.713	0.000	0.628	0.000

Note: *Statistical difference between before and after nursing (P<0.05).

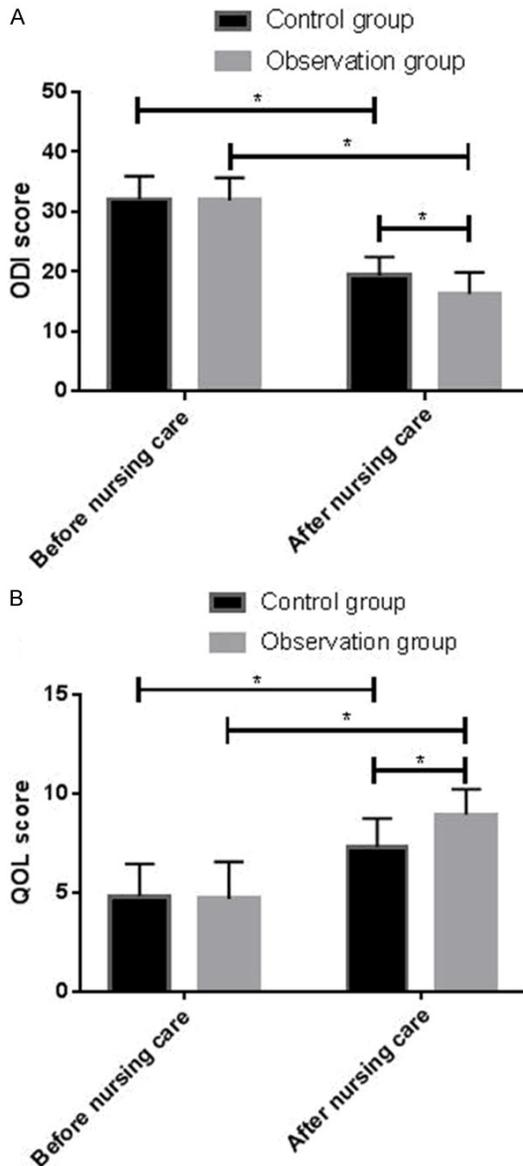


Figure 2. ODI and QOL scores. A. There was no difference in ODI score between the two groups before and after nursing. After nursing, the ODI score of the two groups was significantly lower than that before nursing and the decrease in the control group was significantly lower than that of the observation group. *Significant differences between groups (P<0.05).

B. There was no difference in QOL score between the two groups before nursing. The QOL scores of the two groups decreased and increased significantly after nursing and the increase in the control group was significantly lower than that of the observation group. *Significant difference between groups (P<0.05).

columbar segment are mostly seen with high incidence and acute conditions; severe cases can cause paraplegia and may be life-threatening [9, 10]. The main causes of clinical spinal fractures include external shocks such as car accidents, high-altitude falls, and earthquake crushing, as well as pathological causes such as osteoporosis in the elderly and tumor bone metastasis. Studies have shown that, with the rapid development of social industry, agriculture, and transportation hubs, and the rapid increase in the size of the elderly population, patients with spinal fracture show an increasing trend of being closer in age to the aged group than the young adults [11, 12].

At present, with the development of spine biomechanics and medical imaging technology, the most common treatment for patients with spinal fractures is surgical treatment, and the success rate and prognosis of patients after surgery has greatly improved [13]. Although surgical treatment can improve the disease, patients may experience negative emotions such as anxiety and depression due to the pain of the disease, the occurrence of postoperative complications, the inability to move freely, and the high cost of treatment during treatment [14, 15]. This further prolongs the treatment time, increases medical expenses, and reduces patient quality of life. Clinical nursing staff have found that routine nursing measures can no longer meet the needs of patients; therefore, this study explored a new model of nursing to provide reference to the clinical staff [16]. In the present study, the patient interventions were based on evidence-based nursing inter-

Table 4. Total incidence of post-nursing complications in both groups

Group	Pressure sore	Urinary system infection	Deep venous thrombosis of lower extremity	Amount to	χ^2	P
Control group (n=70)	8 (11.43)	9 (12.86)	3 (4.29)	20 (28.58)	2.237	0.025
Observation group (n=80)	4 (5.00)	6 (7.50)	1 (1.25)	11 (13.75)		

Table 5. Nursing satisfaction in the patient groups

Group	Very satisfied	Satisfied	Same as	χ^2 value	P value
Control group (n=70)	15 (21.43)	39 (55.71)	16 (22.86)	2.143	0.032
Observation group (n=80)	42 (52.50)	30 (37.50)	8 (10.00)		

Table 6. Comparisons of hospitalization times and medical expenses between two groups

Group	Length of stay (d)	Hospitalization costs (thousand yuan RMB)
Control group (n=70)	9.45±3.24	28.4±0.9
Observation group (n=80)	15.74±3.89	33.9±1.9
t value	10.395	21.888
P value	0.000	0.000

ventions based on routine nursing measures. Since the first use of the concept of evidence-based medicine, evidence-based medicine has gradually been applied to various health science fields and is a concept of care resulting from the influence of evidence-based medicine [17].

The main definition of evidence-based nursing is to take scientific research as evidence to propose questions, seek empirical evidence, and implement the best nursing methods according to the actual patient situation [18]. Its core points include: the available and the most suitable basis for nursing research, the clinical experience and technical ability of nursing staff, and the actual situation and desire of patients [19]. Therefore, this study explored the impact of evidence-based nursing on the recovery and complications of patients with spinal fractures and also assessed its application value to provide a reference for clinical treatment.

In this study, the patients were divided into observation and control groups. Patients in the observation group, which were provided evidence-based nursing, had significantly lower SAS and SDS scale scores than patients in the control group during the treatment process. Zhao also showed that evidence-based nursing

can effectively improve anxiety and depression of patients with fractures [20]. In the present study, we observed a significant improvement in anxiety and depression caused by the treatment of patients with spinal fractures based on evidence-based nursing. The main methods of nursing were as follows: appeasing the patient's mood, meeting the patient's psychological needs, and distracting the patient. The

medical staff themselves did not transmit negative energy to the patient because they maintained a positive attitude [21, 22]. We also compared the ODI and QOL scores of the two groups of patients. The results showed improved scores for both after evidence-based nursing compared to those in the control group. Previous studies have shown a significant effect on functional recovery and quality of life of patients with rib fractures by improving ODI and QOL scores [23, 24]. In the present study, evidence-based nursing also had a significant effect on the care of patients with spinal fractures. In addition, we also compared the post-operative complications, hospitalization time, medical expenses, and nursing satisfaction of the two groups, finding that the incidence of complications in the observation group was significantly lower than that in the control group. In addition, the hospitalization time of patients was significantly shorter than that of the control group; the medical expenses of the observation group were significantly lower than that of the control group and the degree of satisfaction of the observation group was significantly higher than that of the control group. The main reason for this finding may be that patients with spinal fractures require long-term bed rest, which may lead to complications such as pressure sores, urinary tract infections, and deep vein thrombosis of the lower extremities, thus aggravating

the condition and lengthening the course of the disease [25]. A lengthened disease course also increases the treatment cost, which leads to decreased nursing satisfaction. Therefore, the development of evidence-based nursing models not only meets the postoperative nursing needs of patients but also greatly reduces the incidence of complications, saves medical costs and treatment time for patients, and improves nursing satisfaction.

However, this study has some limitations. Because of the small number of patients in this trial, it is not clear whether bias exists; in addition, no long-term follow-up was conducted. We hope to increase our sample size in future studies and perform follow-up to understand patient conditions.

In summary, the evidence-based nursing model can accelerate the functional recovery of patients with spinal fractures, reduce the incidence of complications, effectively prevent negative emotions, improve the quality of life of patients, and save patient treatment time and expense. Secondly, the development of evidence-based nursing model improves nursing work procedures and the teamwork awareness of the nursing staff. This model of care has clinical value and can be widely applied to clinical practice.

Disclosure of conflict of interest

None.

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References

- [1] Lukasiewicz AM, Bohl DD, Varthi AG, Basques BA, Webb ML, Samuel AM and Grauer JN. Spinal fracture in patients with ankylosing spondylitis: cohort definition, distribution of injuries, and hospital outcomes. *Spine* 2016; 41: 191-196.
- [2] Kim TY, Jang S, Park CM, Lee A, Lee YK, Kim HY, Cho EH and Ha YC. Trends of incidence, mortality, and future projection of spinal fractures in Korea using nationwide claims data. *Journal of Korean Medical Science* 2016; 31: 801-805.
- [3] Robinson Y, Willander J and Olerud C. Surgical stabilization improves survival of spinal fractures related to ankylosing spondylitis. *Spine* 2015; 40: 1697.
- [4] Rustagi T, Drazin D, Oner C, York J, Schroeder GD, Vaccaro AR, Oskouian RJ and Chapman JR. Fractures in spinal ankylosing disorders: a narrative review of disease and injury types, treatment techniques, and outcomes. *J Orthop Trauma* 2017; 31: S57-S74.
- [5] Walvoord E. Implementation of an evidence-based practice model in a rural community hospital: a guide to neonatal nursing practice. 2018.
- [6] Smith J and Noble H. Bias in research. *Evidence-based nursing* 2014; ebnurs-2014-10 1946.
- [7] Pappas PG, Kauffman CA, Andes DR, Clancy CJ, Marr KA, Ostrosky-Zeichner L, Reboli AC, Schuster MG, Vazquez JA and Walsh TJ. Clinical practice guideline for the management of candidiasis: 2016 update by the infectious diseases society of America. *Clin Infect Dis* 2015; 62: e1-e50.
- [8] Simonetti V, Comparcini D, Flacco ME, Di GP and Cicolini G. Nursing students' knowledge and attitude on pressure ulcer prevention evidence-based guidelines: a multicenter cross-sectional study. *Nurse Education Today* 2015; 35: 573-579.
- [9] Robinson Y, Olerud C and Willander J. Do biological disease-modifying antirheumatic drugs reduce the spinal fracture risk related to ankylosing spondylitis? A longitudinal multiregistry matched cohort study. *BMJ Open* 2017; 7: e016548.
- [10] Nordmeyer M, Pauser J, Biber R, Jantsch J, Lehl S, Kopschina C, Rapke C, Bail HJ, Forst R and Brem MH. Negative pressure wound therapy for seroma prevention and surgical incision treatment in spinal fracture care. *Int Wound J* 2016; 13: 1176-1179.
- [11] Loibl M, Korsun M, Reiss J, Gueorguiev B, Nerlich M, Neumann C, Baumann F. Spinal fracture reduction with a minimal-invasive transpedicular Schanz Screw system: clinical and radiological one-year follow-up. *Injury* 2015; 46: S75-S82.
- [12] Song Y and Lindquist R. Effects of mindfulness-based stress reduction on depression, anxiety, stress and mindfulness in Korean nursing students. *Nurse Education Today* 2015; 35: 86-90.
- [13] Guan X. Clinical analysis of Yiqidaozhi decoction on spinal fracture dislocation postoperative abdominal distention pain. *Journal of Zhejiang Chinese Medical University* 2015; 457-460.

- [14] Kaye ID, Vaccaro AR, Morrissey PB and Hili- brand AS. Is surgery the preferred treatment for neurologically intact patients with unilateral facet fractures and a nonsubluxated cervical spine? *Clin Spine Surg* 2018; 31: E216-E220.
- [15] Kreinest M, Rillig J, Grützner PA, Küffer M, Tinelli M and Matschke S. Analysis of complications and perioperative data after open or percutaneous dorsal instrumentation following traumatic spinal fracture of the thoracic and lumbar spine: a retrospective cohort study including 491 patients. *Eur Spine J* 2017; 26: 1535-1540.
- [16] Aras EL, Bunger C, Hansen ES and Søggaard R. Health-care costs of conservative management of spine fractures in trauma patients. *Eur Spine J* 2017; 26: 1438-1446.
- [17] Ma J. Application of evidence-based nursing in nursing quality management of the urology surgical department. *J Nurs* 2018; 5: 1-3.
- [18] Greenhalgh T. How to read a paper : the basics of evidence-based medicine. Wiley/BMJ Books 2014.
- [19] Dang D and Dearholt SL. Johns hopkins nursing evidence-based practice: model and guidelines. Sigma Theta Tau 2017.
- [20] Mackey A and Bassendowski S. The history of evidence-based practice in nursing education and practice. *J Prof Nurs* 2017; 33: 51-55.
- [21] Zhao JX, Liu XY and Hospital WO. Application of evidence-based nursing in timely nursing of middle-aged and old patients with lower limb fracture. *Nursing Practice & Research* 2017.
- [22] Zhou K, Li X, Li J, Liu M, Dang S, Wang D and Xin X. A clinical randomized controlled trial of music therapy and progressive muscle relaxation training in female breast cancer patients after radical mastectomy: results on depression, anxiety and length of hospital stay. *Eur J Oncol Nurs* 2015; 19: 54-59.
- [23] Theologis AA, Tabaraee E, Toogood P, Kennedy A, Birk H, McClellan RT and Pekmezci M. Anterior corpectomy via the mini-open, extreme lateral, transpsoas approach combined with short-segment posterior fixation for single-level traumatic lumbar burst fractures: analysis of health-related quality of life outcomes and patient satisfaction. *J Neurosurg Spine* 2016; 24: 60-68.
- [24] Banno T, Togawa D, Arima H, Hasegawa T, Yamato Y, Kobayashi S, Yasuda T, Oe S, Hoshino H and Matsuyama Y. The cohort study for the determination of reference values for spinopelvic parameters (T1 pelvic angle and global tilt) in elderly volunteers. *Eur Spine J* 2016; 25: 3687-3693.
- [25] Kessler RA, De la Garza Ramos R, Purvis TE, Ahmed AK, Goodwin CR, Sciubba DM and Abdel-Barr MM. Impact of frailty on complications in patients with thoracic and thoracolumbar spinal fracture. *Clin Neurol Neurosurg* 2018; 169: 161-165.