Observation on effect of differentiated teaching based on LEARNS model in patients with lumbar disc herniation

Junmin Wang, Xiaoshuang Chen

Affiliated Hospital of Nanjing University of Chinese Medicine, Nanjing Integrated Traditional Chinese and Western Medicine Hospital, Nanjing, Jiangsu, 210014, China

Abstract: To explore the effectiveness of differentiated instruction based on The LEARNS mode in the treatment of lumbar disc herniation. 86 patients in total with lumbar disc herniation who were hospitalized in the orthopedics Department of Nanjing Integrated Traditional Chinese and Western Medicine Hospital from March 2022 to February 2023 were randomly divided into the observation group and the control group with 43 cases in each one. Patients in the control group were routinely taught with conventional syndrome differentiation, while those in the observation group adopted patient-centered LEARNS model to carry out syndrome differentiation teaching. The exercise of self-care agency (ESCA), short form health survey (SF-36) and satisfaction levels before intervention and 90 days after intervention were compared between the two groups. There were no significant differences found in ESCA, SF-36 and satisfaction before intervention between the two groups ($p > 0.05$). Ninety days after intervention, the ESCA, SF-36 and satisfaction in the observation group were significantly higher than those in the control group ($p < 0.05$). The differentiated teaching based on LEARNS model has good application effect on lumbar disc herniation patients, and it is an effective alternative method of traditional Chinese medicine nursing health education in clinical practice.

1. Introduction

Lumbar disc herniation (LDH) refers to the clinical manifestations such as weakness, numbness, pain and dysfunction in the corresponding innervation area due to the displacement of some tissues locally of the lumbar disc beyond the normal edge of the disc. The protruding tissues may include cartilage endplate, annulus fibrosus, and nucleus pulposus, or any combination thereof[1]. Lumbar disc herniation is named as lumbar impediment or lumbago in TCM, which is the lumbago caused by meridian block due to trauma, kidney-qi deficiency, decline of essence and qi, and disorders of tendons and arteries. In the clinic, it is often treated in accordance with syndrome differentiation of four different types, namely, i.e., qi stagnation and blood stasis, cold-damp impediment, damp-heat impediment, and liver and kidney deficiency[2]. LDH is one of the most common diseases in clinic. According to the reports, LDH is diagnosed in 10%–15% patients of lumbago clinic in China. Although patients paid more attention to dialectical teaching during hospitalization, and the rehabilitation effect was good, due to the long-term nature of the disease and its tendency to relapse,

it was particularly important to guide LDH patients to pay attention to effective self-health management and improve the quality of life after discharge. Nursing staff is one of the important subjects in teaching according to syndrome differentiation, focusing on the patients. LEARNS model provides us with a good health education method. The LEARNS model[3], which is from the 2012 'Promoting Patient-Centered Learning' guide by the Ontario Association of Registered Nurses (RNAO), includes six links: Listen, Establish, Adopt, Reinforce, Name, and Strengthen.. Its core content is: equality and mutual trust between nurses and patients. The dialectical teaching process focuses on two-way feedback and is gradual and persistent. The purpose of this article is to promote patients' active participation in health education activities using the LEARNS model, to improve their concept of self-health management and to achieve a higher quality of life.

2. Data and methods

2.1 General information

A total of 86 LDH patients who were hospitalized in the Department of Orthopedics, Nanjing Hospital of Traditional Chinese and Western Medicine from March 2022 to February 2023 were selected as the research subjects. The inclusion criteria should be reformulated to use parallel structures, e.g., "patients who meet the diagnostic criteria for LDH[4]," "patients who are undergoing conservative treatment," "patients who have signed an informed consent form," "patients who are between 18 and 65 years of age," and "patients who have completed junior high school or above and have certain communication skills. "The exclusion criteria should also be written using parallel structures, e.g., "patients who have undergone surgery," "patients with lumbar instability and lumbar spondylolisthesis ≥ III," "patients with mental disorders or cognitive impairment," "patients who are pregnant, postpartum, or lactating," and "patients with severe chronic diseases, immunodeficiency, hematological diseases, or malignant tumors. "The average age of the control group should be written as "(mean age: 50.98 ± 11.12 years)." The same applies to the observation group, which should be written as "(mean age: 48.70 ± 11.45 years)."The hospital stay should be written as "hospitalization duration" and not as "hospital stay. "The lesion sites should be reformulated to use parallel structures, e.g., "22 cases with lesions in the lumbar region 4–5 and 21 cases with lesions in the lumbar region 5–sacral region 1" for the control group, and "24 cases with lesions in the lumbar region 4–5 and 19 cases with lesions in the lumbar region 5–sacral region 1" for the observation group.There was no significant difference in general information between the two groups (P>0.05), indicating that they were comparable. The study adhered to the principles of the Declaration of Helsinki and was approved by the Hospital Ethics Committee.

2.2 Methodology

2.2.1 Research methods

The intervention measure was that both groups were given conventional drugs and physical therapy for LDH at the same time. After treatment, patients' symptoms had stabilized. In addition, the control group was given conventional health education was provided to the control group regarding LDH-related knowledge: The responsible nurses provided oral health education to guide their knowledge of the disease, such as diet, daily life, rehabilitation exercise, psychological guidance, various drugs and guide their knowledge of the disease according to the different disease syndromes. Health education manuals were distributed for easy access and reading at any time to help them master the knowledge of disease recovery. Telephone follow-up was conducted for 3 months, once every two weeks after discharge to assess self-management of patient health.

In the observation group, The LEARNS model was used to teach patients with LDH by differentiating their syndrome. The contents are as follows: (1) Preliminary preparation. The nursing staff received 3–5 training sessions of LEARNS model health education method. (2) Formulating implementation plan and process: The implementation plan and process table of the LEARNS health education plan was finally formulated based on the literature review on LDH rehabilitation and the guidance of comprehensive orthopedic nursing experts, and approved by the hospital's medical department and nursing department. The implementation of LEARNS health education was the responsibility of the responsible nurses every day, with technical guidance from the rehabilitation engineer and the supervision of the head nurse. (3) The specific implementation of the LEARNS health education model is as follows: ①Listen: 24 hours after the patient was admitted to hospital, the responsible nurse was responsible for evaluating her condition, character, general information, etc., paying attention to listen to the demands of the patient, and encouraging the patient to participate in the design of the health education content. ②Establish: The nurse-patient communication was conducted once L–2 d after admission with the patients, to establish a good and mutual trust nurse-patient relationship. Attention was paid to sorting out the patients' health status and level of health knowledge reserves related to the disease, adverse influencing factors on the disease and coping strategies in their daily living behavior were carefully collected and discriminated, and rehabilitation care plans were created that were acceptable to both nurses and patients, so that learning time and content arrangement could be jointly decided. ③ A-DOPT (application): The responsible nurse carried out syndrome differentiation education for at least two times 2-3 d after admission. In the process of health education, patients are guided to independently find, put forward and solve problems. Record the patients' learning content and process, grasp the learning progress, for the key content should be strengthened for better learning and education. ④Reinfore (improvement): During hospitalization, responsible nurses further improved patients' cognitive abilities related to their health, paid attention to the patients' psychological acceptance state, and guided the patients' rehabilitation training accordingly. ⑤Name (feedback): During the hospitalization, the reciprocal teaching method was applied once or twice to test and reassess patients' mastery of health knowledge, so as to further consolidate the effect of teaching based on syndrome differentiation. ⑥Strengthen: After the patient was discharged from the hospital, various follow-up activities, such as telephone and video follow-ups, were regularly conducted. For incomplete projects, the responsible nurse commented the reason and reported to the rehabilitation engineer and head nurse; After discussion and analysis, A targeted plan was reformulated, and the responsible nurse reached the unfinished goal again.

2.2.2 Observation indicators

(1) The quality of life (QOL) was assessed by using the Short Form Health Survey (SF-36) before and 90 days after intervention by the nursing staff[5]. This questionnaire was developed by Boston Health Research Institute in the United States. In 1991, the Teaching and Research Section of Social Medicine of Zhejiang University Medical College translated the Chinese version of the short form health questionnaire. The questionnaire comprehensively summarized the life quality of the subjects from eight aspects: physiological function, physiological function, body pain, general health condition, energy, social function, emotional function and mental health. The basic formula for score conversion is: conversion score = (actual score-the lowest possible score in this aspect)/(the difference between the highest possible score and the lowest score in this aspect) *100. The higher the individual and overall scores were, the better the quality of life was.

(2) The self-care ability (ESCA) of patients was investigated and evaluated by the nursing staff before intervention and during the 90-day follow-up after intervention[6]. The ESCA was adopted. The ESCA scale included four dimensions of self-concept, health knowledge, self-care skills and self-

responsibility and consisted of 43 items in total, with 0–4 points for each item and 0–172 points for the total. The higher the scale score was, the stronger the self-care ability was.

(3) A self-made patient satisfaction questionnaire was used 90 days after intervention by the nursing staff and collected in the form of questioning; Patients' and their families' satisfaction with the implementation of learning mode based on syndrome differentiation. The questionnaire content includes patients and their families' enthusiasm and participation, patients' health status, the quality and attitude of nursing staff, the pertinence and practicality of teaching content in accordance with the differentiation of syndromes, and the diversity and interaction of health education forms. Each item has a score of 20, with a total of 100 points. The total score of the questionnaire > 90 points, for very satisfied; 80 ~ 89 points, as satisfactory; < 79 points, unsatisfactory. Nursing satisfaction = (very satisfied+basically satisfied)/total number $\times 100\%$.

2.2.3 Statistical methods

All data were processed by SPSS24.0 statistical software, and measurement data were expressed as mean ± standard deviation ($\bar{x}\pm s$). The two-independent-samples t-test was used for comparison between groups. Count data were expressed as frequency and percentage (%) and the chi-square ($\chi2$) test. A p-value of less than 0.05 was considered statistically significant.

3. Results

Table 1: Comparison of patients' quality of life scores between the two groups ($\bar{x}\pm s$, score)

index		Observation group (n=43)	Regular group (n=43)	T value	P value
physiological function	Pre-intervention	32.13±4.53	31.42±3.79	-0.684	0.925
	Post-intervention	84.52±3.11	65.42±4.73	19.856	<0.001
Physiological function	Pre-intervention	28.86±4.12	28.35±3.51	0.517	0.987
	Post-intervention	79.65±5.14	60.19±4.70	19.458	<0.001
Somatic pain	Pre-intervention	38.86±3.75	39.62±2.47	-0.836	0.893
	Post-intervention	89.07±4.31	62.36±5.13	16.705	<0.001
General health conditions	Pre-intervention	34.76±2.33	34.12±3.54	0.647	0.929
	Post-intervention	87.49±4.35	65.84±3.96	21.640	<0.001
energy	Pre-intervention	43.32±4.78	42.06±4.36	1.276	0.864
	Post-intervention	90.44±4.29	74.82±5.16	15.609	<0.001
Social function	Pre-intervention	55.83±5.21	54.51±4.74	1.326	0.859
	Post-intervention	92.75±4.62	75.43±4.75	17.325	<0.001
Emotional function	Pre-intervention	50.01±3.39	50.87±4.79	-0.867	0.890
	Post-intervention	95.56±4.81	72.49±5.37	23.068	<0.001
mental health	Pre-intervention	43.27±2.63	43.64±3.75	-0.369	0.992
	Post-intervention	89.53±4.57	70.49±5.51	19.036	<0.001

Comparison of patients' SF-36 and ESCA scores before and 90 days after intervention between the control group and the observation group: There was no significant difference in the SF-36 and ESCA scores between the two groups before intervention (P > 0.05). The quality of life (SF-36) and self-care ability (ESCA) scores of the observation group were higher than those of the control group 90

days after intervention, and the differences were statistically significant (P < 0.05). See Table 1 and Table 2.

Table 2: Comparison of scores of self-care ability of patients before and after intervention between the two groups ($\bar{x}\pm s$, score)

dimension	Pre-intervention					90 days after intervention			
	Observation group (n=43)	Control group (n=43)	T value	P value		Observation group (n=43)	Control group (n=43)	T value	P value
Self-concept	11.25±3.37	11.81±2.56	-0.557	0.967		25.51±2.83*	16.72±4.24*	9.132	<0.001
Self-responsibility	9.67±4.23	9.49±3.82	0.275	0.984		20.24±3.36*	15.63±2.91*	5.674	<0.001
Self-care skills	27.94±4.81	27.25±4.47	0.687	0.942		40.36±3.48*	33.67±4.24*	8.367	<0.001
Health knowledge	35.84±4.61	36.43±3.76	-0.569	0.959		61.52±5.11*	53.36±4.48*	7.285	<0.001
Note: compared with self before intervention, *P<0.05									

There was no significant difference in patient satisfaction scores of 90 days before and after intervention between the control group and the observation group (P > 0.05). The patient satisfaction score of the observation group was significantly higher than that of the control group 90 days after the intervention, and the difference was statistically significant (P < 0.05). See table 3.

Table 3: Comparison of patient satisfaction scores between the two groups (%)

project	Observation group (n=43)	Control group (n=43)	χ2	P value
Very satisfied	12(27.90)	4(9.30)		
be satisfied	28(65.12)	25(58.14)		
Dissatisfied	3(6.98)	14(32.56)		
Satisfaction rate (%)	93.02	67.44	5.216	0.025

4. Discussion

People's daily poor lumbar use habits lead to LDH. During the attack, patients present with severe waist and leg pain, unfavorable bending, inconvenience in walking, significant decline in self-care ability, etc., and often cannot carry out normal life and work. It has been reported in the literature in China that the incidence of LDH is significantly increased and the average age of patients is becoming younger. In China, LDH patients account for 15.2% of the total population, but it is still on the rise and rapidly expands from the middle-aged and elderly to young adults year by year[7].

Most patients have low self-management ability, and conventional health education cannot help patients to develop good healthy behaviors, which leads to the failure of disease recovery to achieve the expected results[8-9]. During the hospitalization, under the careful treatment, care and health guidance of medical staff, the patients had high compliance and often focused on taking the right lifestyle, and a series of symptoms were alleviated or improved. However, patients' compliance and concentration were significantly decreased when they re-engaged in the original rhythm of life and work to maintain a correct lifestyle after discharge, which often led to the recurrence of LDH and unsatisfactory rehabilitation effect.

The demonstration by Zhou Xiaoqin and Ye Jing et al. showed that nursing based on syndrome differentiation in LEARNS model was a targeted health education model that fully met the patients' individual needs for disease rehabilitation[10][11]. Based on the dialectical teaching of the LEARNS model, the six links including listening, establishment, application, improvement, feedback teaching and strengthening are used, instead of one-way guidance for patients' health problems, the reverse teaching method is integrated into health education, the original health knowledge of patients is carefully sorted out, the correct life style and behavior are confirmed and maintained, and those who are vague and uncertain are identified, and the bad behavior habits that need to be avoided are clarified. In this study, the SF-36 and ESCA scores of patients before and 90 days after intervention in the

control group and the observation group were compared. The results showed that there was no significant difference in SF-36 and ESCA scores between the two groups before intervention. The scores of SF-36 and ESCA of patients in the observation group were significantly higher than those of the control group 90 days after intervention, and the differences were statistically significant ($P < 0.05$). The process of differentiated instruction in LEARNS mode was focused and easy to understand, which was convenient for patients to master and copy the contents of health education. There was no significant difference in patient satisfaction scores between the two groups before intervention ($P > 0.05$). The patient satisfaction scores in the observation group were significantly higher than those in the control group 90 days after intervention, with a statistical difference ($P < 0.05$). The differentiated nursing in LEARNS mode could enhance patients' conscious compliance. It can significantly improve patients' self-health management ability and confidence, which is of great significance for preventing the recurrence of LDH after discharge and improving the quality of life, and it is consistent with the conclusion of Yuan Hong, Xiaoqin Xu and others[12-13]. Dialectical nursing in LEARNS model is not only a channel for effective communication between medical staff and patients and their families, but also a way for hospitals to move to the family and society, which can provide more economic and effective continuous care for patients. It was beneficial for nursing staff to carry out differentiated nursing in a targeted manner, and improve work efficiency and the quality of nursing.

Therefore, this article provides an effective working method for clinical syndrome differentiation teaching through practice. Syndrome-based teaching based on the LEARNS model can improve patients' awareness of diseases, prompt them to effectively implement self-care, and maintain good health behaviors. At the same time, it also greatly improved the self-management ability and quality of life of LDH patients after discharge, and improved the satisfaction of patients.

References

[1] Deyo RA, Mirza SK. Clinicalpractice. Herniatedlumbar intervertebraldisk [J]. NEnglJMed, 2016, 374(18):1763-1772. DOI: 10. 1056/NEJMcp1512658.

[2] State administration of traditional chinese medicine. Notice on Issuing the TCM Nursing Program for 13 Diseases including Stroke (Trial) [A/OL]. (2013-05-16) [2019-0L-01].

[3] Zhou Fen, Hao Yufang, Guo Hong, et al. A brief analysis of guidelines for Promoting Patient-Centered Learning by Ontario Nursing Association in 2012 [J]. Chinese Journal of Modern Nursing, 2018, 24(19):2233-2234.

[4] BACKGROUND: Basic research and transfer chemistry group, Spine and spinal cord professional committee of China Rehabilitation Association. Guidelines for the diagnosis, treatment and rehabilitation management of lumbar disc herniation [J]. Chinese Journal of Surgery, 2022, 60(5):401-408.

[5] Popp, David. Cell type-specific functions of TYK2 in the antiviral defense against MCMV[J]. 2012.

[6] Sun Xiaolin. Nursing based on syndrome differentiation on anxiety and depression of coronary heart disease and patients' self-care ability [J]. Journal of changchun university of traditional chinese medicine, 2018, 34(1):142-144.

[7] BAKER A D L. Lumbar Disc Herniation: a controlled, prospective study with ten years of observation [J]. Spine, 2014, 3(1): 30-40.

[8] Xu Pei. Effect of clinical nursing pathway combined with health education on pain and quality of life in patients with LDH [J]. Modern Nursing: Shangxunjian, 2019, 26(10):46-48.

[9] Liu Ying. Effect of personalized care on quality of life and SAS and SDS scores of patients with LDH [J]. Electronic Journal of Practical Clinical Nursing, 2018, 3(29):52, 54.

[10] Zhou Xiaoqin, Wang Zhiping, Dou Xinman, et al. Application of LEARNS model in health education for patients with type 2 diabetes [J]. Chinese nursing management, 2020, 20 (4): 564-568.

[11] Ye Jing, Zhang Rui, Ma Yuan, Han Xiaoning, Ding Wenhui, Tao Zhenhui, Li Jing, Zheng Yimei. Application of LEARNS model in health education for outpatient follow-up of patients with heart failure [J]. Chinese nursing management, 2021, 21(11):1622-1627.

[12] Yuan Hong, Xiaoqin Xu, Qi Longju. Study on the application of LEARNS model to the rehabilitation training effect and life quality of patients with LDH [J]. Journal of Nantong University (Medical Edition), 2022, 42 (2): 192-194.

[13] Li Qin, Yuan Jinghua, and Lu Jianfang. Effects of ward assistant service model on self-care ability and self-efficacy of elderly patients with chronic diseases [J]. Nursing of Integrated Chinese and Western Medicine (Chinese and English), 2017, 3 (1): 40–43.