Application Effectiveness of Internet Collaborative Continuity Rehabilitation Nursing in the Recovery of Elderly Patients after Lumbar Fusion Surgery

Jianjun Lai, Ping Ma

Surgical Outpatient Department of Shandong Provincial Hospital Affiliated to Shandong First Medical University, Jinan, 250021, China

Introduction. To explore the clinical application effect of Internet collaborative continuous rehabilitation nursing for elderly patients after lumbar fusion surgery.

Methods. A total of 120 elderly patients after posterior foraminal interbody fusion treated in our hospital from June 2019 to August 2023 were selected as the research objects and randomly divided into two groups, with 60 cases in each group. Patients in the control group were given traditional continuous rehabilitation nursing, while patients in the experimental group were given Internet collaborative continuous rehabilitation nursing. The lumbar spine function, subjective well-being, psychological resilience and quality of life of patients in the two groups were compared and analyzed.

Results. The JOA score and ODI score of the two groups of patients at discharge were compared and analyzed (P>0.05). After 3 months of nursing, the JOA score of the experimental group was significantly higher than that of the control group with traditional continuous rehabilitation nursing. However, the ODI score of the experimental group was lower than that of the control group with traditional continuous rehabilitation nursing. There was no statistically significant difference in the scores of each index of subjective well-being between the two groups (P>0.05). After 3 months of nursing, compared with the patients in the control group who received traditional continuous rehabilitation nursing, The scores of each index of subjective well-being of patients in the experimental group using Internet collaborative continuous rehabilitation nursing were significantly higher (P<0.05). The Internet collaborative continuous rehabilitation nursing model can help the rehabilitation of elderly patients after lumbar fusion surgery, improve the patients' lumbar function, improve the patients' psychological state, improve the patients' subjective well-being and life treatment, which is worthy of clinical promotion and application.

Keywords. Internet; Continuous rehabilitation nursing; Lumbar fusion; Clinical effect

INTRODUCTION

Posterior lumbar interbody fusion is the main treatment for degenerative lumbar spondylolisthesis complicated with spinal stenosis in the elderly. Lumbar fusion is a surgical procedure to stabilize the lumbar spine, relieve pain, and improve spinal stability by fusing two or more lumbar vertebrae together. It is commonly used to treat lumbar disc herniation, lumbar fracture, lumbar spondylolisthesis and other lumbar diseases. The main purpose of lumbar fusion is to relieve pain, improve lumbar function and correct lumbar deformity. By fusion of the lumbar vertebrae, the lumbar spine can be stabilized and the motion between the lumbar vertebrae can be reduced, thus reducing pain. At the same time, the fused lumbar vertebrae can form a lasting connection, improve the stability of the spine, and improve the function of the lumbar spine. In the case of lumbar deformity, lumbar fusion can correct the position of the deformity and restore the normal shape of the spine. The postoperative recovery period usually takes 3-6 months, during which regular reexaminations are required. Patients require a period of bed rest after surgery and a series of rehabilitation exercises to promote bone growth and healing. During recovery, patients need to take care to maintain good posture and avoid strenuous exercise and overexertion. However, patients usually have more bleeding, and will feel pain after surgery, muscle weakness, and waist function disorder. The key to continuous nursing for elderly patients is to strengthen rehabilitation nursing after their discharge [1-2]. Internet collaboration with continuous rehabilitation nursing provides a comprehensive set of discharge rehabilitation nursing programs for elderly patients, and is widely used in clinical practice, such as joint replacement, spinal cord injury, lumbar vertebral compression fracture, and so on, with good application effects. This paper selected 120 elderly patients after posterior foraminal interbody fusion treated in our hospital from June 2019 to August 2023 as the research object, aiming to explore the clinical application effect of Internet collaborative continuous rehabilitation nursing for elderly patients after lumbar fusion, as reported below.

1 MATERIALS AND METHODS

1.1 General Information

A total of 120 elderly patients after posterior foraminal interbody fusion treated in our hospital from June 2019 to August 2023 were selected as the research objects and randomly divided into two groups, with 60 cases in each group. Inclusion criteria: (1) single segment underwent posterior foraminal interbody fusion; (2) The patient could

actively cooperate with the treatment; (3) complete clinical data of patients; (4) Patients have signed the informed consent. Exclusion criteria: (1) patients with severe organ injury; (2) patients with immune diseases; (3) severe liver and kidney damage; (4) patients with heart, lung, brain and other diseases; (5) women with cerebrovascular disease, acute cardiovascular disease, recovery from major surgery, pregnancy and lactation; (6) patients with other serious skin diseases; (7) Patients with allergic history were investigated. This study was approved by the Ethics Committee of this study and signed by all patients participating in the experiment.

1.2 Methods

The patients in the control group were given traditional continuous rehabilitation nursing. After the patients were treated in the hospital, the patients were given the lumbar spine rehabilitation data compiled by our hospital, covering diet, specific medication, postoperative rehabilitation and other aspects. To enable patients to develop healthy living habits, in order to recover as soon as possible to often exercise, do not sit for a long time. The waist can not bear weight, can not bend down, can not twist waist for 3 months. Walk for more than 30 minutes a day and exercise your waist and leg muscles for 30 minutes.

Patients in the experimental group were given Internet collaborative continuous rehabilitation nursing, and a multidisciplinary collaboration team was established. The attending doctor was responsible for explaining the condition, surgical process, online treatment and postoperative examination. Rehabilitation nurses should explain the precautions of functional exercise and related preventive measures to patients, and record the functional recovery of patients in a timely manner. Nurses were responsible for health education for patients, to help patients better understand their own diseases, to supervise the rehabilitation of patients and medication status, and to remind patients to be able to take the initiative to the hospital for reexamination after surgery. On this basis, we built a wechat platform with two attending doctors and two rehabilitation nurses as management. Through the wechat platform, we can better provide patients with disease-related knowledge and rehabilitation programs. First, diseases and surgical methods: a brief introduction to patients through some video, including the surgical process, surgical risks, postoperative diet care, defecation care, correct sitting posture and so on. The second was postoperative rehabilitation training: rehabilitation nurses explained the rehabilitation training of waist and leg muscles, especially the paraspinal muscles; Because most of the elderly have poor muscle strength and coordination, the research team made improvements, such as replacing the traditional five-point support with a three-point support, and focusing on the waist and lower limbs. It is recommended that patients should exercise their waist and legs at least 5 times a day, video recording should be performed in the early stage, and

photos should be taken in the later stage. Certain guidance should be given to patients to help them correct the mistakes. Nursing staff monitored the patient's condition, self-management ability and other aspects of satisfaction; Through communication with patients, the patient's psychological resilience, functional recovery and quality of life were understood.

1.3 Indicators of observation

Oswestry Disability Index (ODI) was used to analyze and compare the lumbar spine function between the experimental group and the control group before intervention, 1 month and 3 months after intervention. The subjective well-being rating scale was used to analyze the subjective well-being of the two groups of patients, a total of 4 dimensions, a total of 50 items, one item 1-4 points; The Connor-Davidson Resilience Scale was used to analyze and compare the psychological resilience of the two groups of patients. The higher the score of the patients, the better the psychological resilience. The Short Form Health Survey (SF-36) was used to evaluate the life treatment of the two groups. The total score was 100 points, and the higher the score, the better the quality of life of the patients. The nursing satisfaction of patients was evaluated by the questionnaire designed by Yang Hongnu et al.

1.4 Statistical methods

In this paper, SPSS20.0 statistical software was used for data processing and analysis. All measurement data in this paper were expressed in the way of x±s, and the results were tested by t test. All the count data in this paper are expressed as percentage (%), and the results are tested by χ^2 test. $P<0.05$ was considered statistically significant.

2 RESULTS

2.1 The lumbar function of the two groups was compared and analyzed

The JOA score and ODI score of the two groups of patients at discharge were compared and analyzed ($P>0.05$). After nursing, compared with the control group, the JOA score of the experimental group was significantly higher, but the ODI score of the experimental group was lower, and the difference was statistically significant ($P<0.05$). See Table 1 below for details.

Table 1 compares and analyzes the lumbar spine function of the two groups

Groups	JOA score		ODI score	
	At discharge	After 3 months of care	At discharge	After 3 months of care
Control group	18.37±2.16	21.26±1.01*	42.63±4.21	33.79±7.22*
Experimental group	18.48±2.07	24.76±1.12*	42.79±1.11	19.89±5.21*
t value	0.268	16.659	0.173	11.126
P value	0.795	0.000	0.862	0.000

2.2 The subjective well-being of the two groups of patients was compared and analyzed

After 3 months of nursing, compared with the patients in the control group who received traditional continuous rehabilitation nursing, the scores of each index of subjective well-being of the patients in the experimental group who received Internet collaborative continuous rehabilitation nursing were significantly higher, and the differences were statistically significant ($P<0.05$). See Table 2 below for details.

Table 2 compares and analyzes the subjective well-being of the two groups of patients

Groups	Objective support		Subjective support		Self-assessment		Subjective well-being index	
	At discharge	After 3 months of care	At discharge	After 3 months of care	At discharge	After 3 months of care	At discharge	After 3 months of care
Control group	8.31±1.16	11.26±1.91*	10.63±3.21	16.79±2.22*	28.37±5.16	35.26±6.01*	52.63±5.21	77.79±7.62*
Experimental group	8.48±1.07	16.76±2.12*	11.79±3.11	19.36±4.21*	28.48±5.67	43.76±1.12*	52.79±1.11	87.52±8.21*

| t value | 0.921 | 9.101 | 0.436 | 5.423 | 0.096 | 5.436 | 0.076 | 5.721 |
| P value | 0.352 | 0.000 | 0.655 | 0.000 | 0.926 | 0.000 | 0.935 | 0.000 |

2.3 The psychological resilience of the two groups of patients was compared and analyzed

By comparing and analyzing the lumbar spine condition of the two groups of patients at discharge, compared with the control group of patients with traditional continuous rehabilitation nursing, the psychological resilience score of the experimental group of patients with Internet collaborative continuous rehabilitation nursing was significantly higher, and the difference was statistically significant (P<0.05). See Table 3 below for details.

Table 3 compares and analyzes the psychological resilience of the two groups of patients

Groups	Tenacity		Strength		Optimism		Total score	
	At discharge	After 3 months of care	At discharge	After 3 months of care	At discharge	After 3 months of care	At discharge	After 3 months of care
Control group	36.31±5.16	45.26±7.2*	18.33±3.11	25.79±2.67*	8.25±1.16	12.26±1.75*	62.83±5.65	81.79±4.62*
Experimental group	36.48±5.37	51.76±6.8*	18.79±3.25	32.11±2.51*	8.42±1.37	16.76±2.12*	62.79±5.81	96.46±6.21*
t value	0.146	3.281	0.236	12.463	0.296	9.336	0.176	13.721
P value	0.872	0.000	0.855	0.000	0.776	0.000	0.835	0.000

2.4 The quality of life of the two groups was compared and analyzed

The lumbar spine condition of the two groups of patients at discharge was compared. Compared with the control group of patients using traditional continuous rehabilitation nursing, the scores of each index of life treatment of the experimental

group of patients using Internet collaborative continuous rehabilitation nursing were significantly higher (P<0.05), as detailed in Table 4 below.

Table 4 compares and analyzes the quality of life of the two groups

Groups	Objective support		Subjective support		Self-assessment		Subjective well-being index	
	At discharge	After 3 months of care	At discharge	After 3 months of care	At discharge	After 3 months of care	At discharge	After 3 months of care
Control group	63.42±5.16	83.26±5.91*	67.33±5.21	84.71±4.22*	60.31±5.16	82.26±6.01*	55.23±5.51	80.79±6.62*
Experim ental group	63.48±5.57	93.76±5.12*	67.79±5.88	92.36±3.25*	60.39±5.27	90.76±5.32*	56.45±5.31	93.12±5.51*
t value	0.051	8.131	0.136	9.223	0.156	7.166	0.256	9.821
P value	0.952	0.000	0.785	0.000	0.886	0.000	0.805	0.000

3 DISCUSSION

The elderly patients with lumbar spondylolisthesis complicated with spinal stenosis generally have more underlying diseases. Lower limb weakness, lack of understanding of the disease, lack of rehabilitation training, low self-management level after discharge, and lack of professional supervision and guidance caused slow postoperative recovery, low back pain and other problems [3]. Through the research, this paper found that "Internet" combined with continuous rehabilitation nursing has great benefits in relieving pain, promoting the recovery of lumbar spine function, improving the self-management ability of patients, and adhering to medication compliance [4-5]. The reasons for this may be as follows: first, the team carefully produced a vivid video that was easy for patients to accept; Easy for patients to watch again and again, easy for patients to learn; The second is to establish an effective and fast communication platform between doctors, nurses and patients to ensure the

rehabilitation effect of patients. The third is to strengthen the monitoring, improve the initiative and spontaneity of patients, and respect the medical behavior of patients to achieve the purpose of rehabilitation [6-7]; Fourth, this method can avoid the time-consuming and laborious of the traditional way of outpatient follow-up, and make the patients easy to accept; Fifth, it is convenient to conduct one-on-one rehabilitation guidance for patients.

Long-term low back pain, lower limb weakness and surgical trauma in the elderly can cause negative emotions, such as anxiety and depression [8]. Corresponding psychological counseling should be given immediately. Patients can learn to enhance their understanding of the disease and rehabilitation knowledge, eliminate their anxiety and negative emotions, and enable them to actively participate in rehabilitation training [9]. After the patient is discharged, effective communication with the patient should be strengthened, and good psychological counseling should be given to the patient, so that the patient can build up the confidence to overcome the disease [10]. The study found that the subjective well-being of the two groups of patients at discharge was compared and analyzed. After 3 months of nursing, compared with the control group of patients using traditional continuous rehabilitation nursing, the subjective well-being of the experimental group of patients using Internet collaborative continuous rehabilitation nursing was significantly higher ($P<0.05$). After 3 months of nursing, compared with the patients in the control group who used traditional continuous rehabilitation nursing, the psychological resilience score of the patients in the experimental group who used Internet collaborative continuous rehabilitation nursing was significantly higher ($P<0.05$). The Internet collaborative continuous rehabilitation nursing model realizes the face-to-face communication between doctors, nurses and patients [11-12]. Meanwhile, the medical and nursing staff of our hospital have rich clinical and rehabilitation experience and can tailor various rehabilitation programs for patients [13]. The results of this study compared and analyzed the lumbar spine condition of the two groups of patients at discharge. After 3 months of nursing, compared with the control group of patients with traditional continuous rehabilitation nursing, the scores of each index of life treatment in the experimental group of patients with Internet collaborative continuous rehabilitation nursing were significantly higher, and the differences were statistically significant ($P<0.05$). It shows that the implementation of the Internet collaborative continuous rehabilitation nursing model can effectively improve the quality of life of patients and enhance the satisfaction of patients.

To sum up, the Internet collaborative continuous rehabilitation nursing model is patient-centered. Based on this, this study proposes a Web-based, targeted rehabilitation nursing program with good clinical application prospects, which can help the elderly recover lumbar function after lumbar fusion surgery, reduce

postoperative pain, and effectively prevent the occurrence of postoperative complications. At the same time, it can also improve patients' self-management skills.

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Corresponding Author:

Jianjun Lai

Surgical Outpatient Department of Shandong Provincial Hospital Affiliated to Shandong First Medical University, Jinan, 250021, China

E-mail: sdslyy2199@163.com