

Participatory continuous nursing using the WeChat platform for patients with spinal cord injuries

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Abstract

Objective: The study aim was to analyse the effect of participatory continuous nursing using the WeChat platform on the complications, family function and compliance of patients with spinal cord injuries.

Methods: This was a randomized controlled trial. Seventy-eight patients with stable disease treated by internal fixation were enrolled in the study from August 2017 to August 2019 and assigned equally to an observation group and a control group. The control group received regular care from the time of discharge. The observation group used the WeChat platform to participate in continuous care.

Results: Six months after discharge, the continuous nursing group had a significantly lower incidence of pressure ulcers, urinary tract infections, joint contractures and muscle atrophy than the control group. The continuous nursing group showed a significant improvement in family function level and compliance behaviour at 3 and 6 months after discharge.

Conclusion: A participation-based continuous nursing intervention using the WeChat platform can reduce the incidence of pressure ulcers, urinary tract infections, joint contracture and muscle atrophy; improve patient family function; and promote healthy compliance behaviour.

Keywords

WeChat platform, continuous care, spinal cord injury, family function, health behaviour, participatory, compliance, randomized control trial

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Introduction

Spinal cord injury is a serious, disabling disease that can cause varying degrees of

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paralysis, hindering patients' ability to care for themselves and seriously affecting their quality of life.¹⁻⁴ With the rapid economic development in China, the incidence of spinal cord injuries has increased; the reported incidence of such injuries ranges from 13.77% to 58.11% of the total population of China.⁵⁻⁸ Spinal cord injury disease is characterized by severity, complexity, length and irreversibility. Prompt treatment can stabilize the patient's condition in the acute phase, but follow-up treatment requires a long-term family rehabilitation process aimed at benefiting the patient's family function and daily behaviour. These factors play an important role in the development and outcome of the disease during the rehabilitation period. Poor family function and inappropriate behaviour, such as disruptive and hostile interactions with caregivers, can lead to a variety of complications, increasing the psychological burden of patients and slowing down the recovery process. Therefore, it is important to provide active follow-up care interventions for patients after discharge. WeChat is a simple, convenient and fast communication platform that is widely used with domestic smartphones. In recent years, the usefulness of WeChat's multiple functions in providing continuous care has been increasingly recognized in clinical nursing management.

This study was conducted to examine the effect of participatory continuous nursing using the WeChat platform on the complications, family function and compliance behaviour of patients with stable spinal cord injury treated by internal fixation.

Methods

Patients

Patients with stable disease treated by internal fixation between August 2017 and August 2019 in a major tertiary teaching hospital in China were recruited using

convenience sampling. Patients and primary caregivers were divided into a continuous nursing group and a control group according to the random number table method. This study was approved by the ethics committee of Lishui Central Hospital (approval no. 2017-50), and all patients provided written informed consent. The procedure was part of the usual treatment discharge follow-up.

Inclusion and exclusion criteria

The inclusion criteria were as follows: (1) patients with spinal cord injuries confirmed by imaging examination; (2) patients with sensorimotor dysfunction and reduced muscle strength according to the American Spinal Injury Association neurological function classification; (3) patients with stable disease treated by internal fixation; (4) educational level of primary school or above, able to communicate and provide either written or verbal informed consent.

The exclusion criteria were as follows: (1) patients with other serious diseases; (2) incomplete clinical data; (3) patients who did not have a smartphone.

Intervention

The intervention lasted for 6 months. Initial stage: On the day of discharge, the patient's recent care plan was established, and follow-up files were generated to allow patients or their families to join the WeChat group.

Continuous care phase: The following intervention method was used. A one-on-one continuous care intervention was provided by a team member for patients and primary caregivers. The intervention content comprised 1) prevention and care of complications; 2) rehabilitation exercises; 3) dietary management; 4) family and social support; 5) psychological adjustment; 6) self-care management.

Family Assessment Device (FAD)

The FAD comprises seven dimensions: problem solving, communication, role function, emotional response, emotional intervention, behaviour control and total function. Each item has four possible responses. Items are scored on a four-point Likert scale: strongly agree (Very like my home)=1, agree (Like my home)=2, disagree (Not like my home)=3, strongly disagree (Not at all like my home)=4. Negatively worded items are reverse scored. The total score ranges from 60 to 240. Higher scores indicate poorer family function. Advantages of this scale are that it is simple, fast, reliable and valid. Cronbach's α coefficient for the scale is 0.78 to 0.86.⁹

Health Promoting Lifestyle Profile (HPLPII)

Items on the HPLPII are scored using a four-point Likert scale: 1=never, 2=sometimes, 3=often, 4=the same. The total possible score ranges from 52 to 208. Higher scores indicate better health. The HPLPII used in this study was based on relevant research publications in China and other countries and on the scale developed by Zhang et al.¹⁰ The original HPLP scale was compiled by Walker et al.¹¹ and modified by Zhang et al.¹⁰ The scale items were revised to be appropriate for assessing the characteristics of spinal cord injury disease. Five experts evaluated and revised the semantics and expression of the scale to be applicable in this context. The revised scale has demonstrated good face validity, with a content validity index of 0.92, and good reliability (Cronbach's α of 0.95).

Statistical analysis

PASW Statistics for Windows, Version 18.0 (SPSS Inc., Chicago, IL, USA) was used for statistical analysis. Continuous variables are expressed as mean \pm standard deviation.

Discontinuous variables are expressed as percentages. The t-test was used for between-group comparisons of normally distributed data. Non-parametric tests were used for between-group comparisons of non-normally distributed data. Frequency data were tested using chi-square. Analysis of variance was used to examine the effect of group and time point on family function and health behaviour. A value of $P < 0.05$ was considered statistically significant.

Results

Patient characteristics

Forty-one patients were enrolled in the continuous nursing group and 40 in the control group. Of these, 2 patients from the continuous nursing group and 1 from the control group were lost to follow-up, leaving 39 in both the continuous nursing group and the control group. There were 40 men and 38 women, with a mean age of 47.12 (\pm 10.90) years. Twenty-six participants had primary school level of education, 32 junior high school level and 20 high school level and above. Of participants, 63 were married, 10 unmarried, and 5 divorced or widowed. There were 25 complete spinal cord injuries, 53 incomplete spinal cord injuries, 10 cervical spinal cord injuries, 32 thoracic spinal cord injuries and 36 lumbar spinal cord injuries. There were no significant differences in patient characteristics between the two groups.

Between-group comparison of complication rate

The incidences of skin pressure injury, urinary tract infections, joint contracture and muscle atrophy in the continuous nursing group were lower than those in the control group. The difference was statistically significant ($P < 0.05$). There was no significant difference in the incidence of pulmonary infection and deep vein thrombosis (Table 1).

Table 1. Comparison of post-intervention complication rates between two patient groups

Group	Cases	Pressure sores	Lung infection	Urinary system infection	Joint contracture	Muscle atrophy	Deep vein thrombosis
Intervention group	39	2 (5.13)	1 (2.56)	1 (2.56)	2 (5.13)	1 (2.56)	1 (2.56)
Control group	39	9 (23.08)	6 (15.38)	8 (20.51)	9 (23.08)	9 (23.08)	4 (10.26)
χ^2		5.186	2.511	4.522	5.186	7.341	0.855
P-value		0.023	0.113	0.033	0.023	0.018	0.355

Data are n (%).

Between-group comparison of family function

A 2 (group: continuous nursing group, control group) \times 3 (time point: 1 day before discharge, 3 months after discharge, 6 months after discharge) mixed design analysis of variance showed a significant interaction between group and time point on patients' family function ($F=61.709$, $P<0.001$). The main effect of group was also significant ($F=4.393$, $P=0.039$). There was a significant difference in FAD scores at 3 months and 6 months between the continuous nursing group and the control group ($P<0.05$); the main effect of time point was also significant ($F=79.899$, $P<0.001$). Additional pairwise comparisons (Bonferroni method) showed that there was a significant difference in FAD scores in the intervention group between 1 day before discharge, 3 months of intervention, and 6 months of intervention ($P<0.05$, Table 2).

Between-group comparison of health behaviour

A 2 (group: continuous nursing group, control group) \times 3 (time point: 1 day before discharge, 3 months after discharge, 6 months after discharge) mixed design analysis of variance showed a significant interaction between group and time point on patient health behaviour ($F=46.391$, $P<0.001$). The main effect of group was also significant ($F=5.177$, $P=0.026$). The

HPLPII scores in the continuous nursing group 1 day before discharge, and 3 and 6 months after discharge were significantly higher than those of the control group ($P<0.05$). The main effect of time point was also significant ($F=65.741$, $P<0.001$). Additional pairwise comparisons (Bonferroni method) showed that health behaviour scores in the continuous nursing group were higher after 3 months of intervention than before intervention ($P<0.05$), but there was no significant difference between 6 months and 3 months after discharge (Table 3).

Discussion

Continuous care can provide patients with family-to-family collaborative and continuous care; encourage patients to transition from hospital to family life more smoothly, safely and effectively; and identify health issues.¹² This study established a method of communication between medical staff and patients using the WeChat platform, and used online guidance to improve patients' health knowledge and skills. The WeChat platform has been previously used to establish standardized nursing behaviours and help patients to communicate the status of their disease by uploading photographs or videos; this enables medical staff to intuitively understand the patient's status, assess any signs of complications and communicate with patients.¹³

Table 2. Comparison of FAD scores between two patient groups

Group	1 day before discharge	3 months after discharge	6 months after discharge	F value	P-value
Intervention group (n = 39)	133.72 ± 14.48	122.02 ± 13.96	113.67 ± 15.18	18.691	<0.001
Control group (n = 39)	130.31 ± 16.60	130.31 ± 15.45	128.92 ± 12.72	0.111	0.895
t value	0.967	-2.484	-4.810		
P-value	0.337	0.015	<0.001		

Data are means and standard deviations. FAD, Family Assessment Device.

Table 3. Comparison of modified HPLPII scores between two patient groups

Group	1 day before discharge	3 months after discharge	6 months after discharge	F value	P-value
Intervention group (n = 39)	122.26 ± 21.83	134.18 ± 20.76	138.69 ± 19.68	6.515	0.002
Control group (n = 39)	121.10 ± 20.62	120.87 ± 18.11	123.00 ± 18.36	0.146	0.864
t value	0.240	3.016	3.641		
P-value	0.811	0.003	<0.001		

Data are means and standard deviations. HPLPII, Health Promoting Lifestyle Profile.

Thoracic and lumbar vertebrae fractures with spinal cord injuries are serious diseases.¹⁴ Post-traumatic physical dysfunction has a major effect on the bodies, minds and daily lives of patients.^{15,16} Poor family functioning, causing negative emotions and negative coping behaviours, can affect physical rehabilitation and lead to various mental illnesses.¹⁷ Researchers have found that orthopaedic trauma has an effect on family stability, intimacy, individual independence, communication ability and the family function of the injured person.¹⁸⁻²² The present study examined the characteristics of patient family function after discharge and used continuous care to help families use existing resources. Patients were able to communicate with health care workers after hospital discharge using the WeChat platform. Communication between nurses, psychological counsellors and patients mitigates stress in patients and family members, helps patients and their families to adapt to their new roles and improves the patient's family support function.

The rehabilitation of thoracolumbar fractures with spinal cord injuries depends on short-term medical and nursing care.²³ Patients must also develop healthy long-term behaviours and attitudes, such as strict proper nutrition intake, a moderate amount of timely rehabilitation, psychological self-adjustment, active self-monitoring and tackling bad habits.²⁴ There were several study limitations. This was a single-centre trial and the sample size was limited. Additional potential problems with this design are network restrictions and the reluctance of some elderly people to use WeChat. Further research is therefore needed to develop accessible continuous care services appropriate for a wider rehabilitation population.

Conclusion

Continuous care using the WeChat platform not only meets the needs of patients outside the hospital but also improves the quality of medical care, increases patient

satisfaction and is economical. More interventions using the WeChat platform should therefore be developed and promoted.

Declaration of conflicting interest

The authors declare that there is no conflict of interest.

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