

Influence of “Internet plus” based continuous nursing intervention on hemodialysis self-management ability of patients with uremia and its countermeasures

Zhou Xin*1, Zhong Xiaomei, Qian Jia, Wu Xiao, Yin Jianfang, Jiang Xiaomei
Hemodialysis Center, The No.2 Hospital Affiliated to Suzhou University, Suzhou Jiangsu
215004, China
ntszzx@126.com

Abstract:

Objective: To analyze the impact of “Internet Plus”oriented continuous nursing intervention on hemodialysis self-management ability (HSMA) of patients with uremia and its countermeasures.**Methods:** 60 uremia patients admitted to hemodialysis in the hospital from January to December 2018 were selected as the control group (using routine continuous nursing intervention); 60 uremia patients admitted to hemodialysis from January to December 2019 were also selected as the observation group (using "Internet Plus"oriented continuous nursing intervention); the changes in the score values of the two groups of patients according to the self-management scale (SMSH) and chronic disease health literacy after intervention respectively. **Results:** After intervention , the self-management score of the patients in the observation group in terms of problem solving, emotional processing and self-care was higher than that of the control group ($P<0.05$), and the score value in terms of information acquisition ability, improvement of health willingness, communication and interaction ability was higher than that of the control group ($P<0.05$).**Conclusion:**the continuity of nursing intervention based on “Internet plus”self-management enhances the self-management ability of patients with uremic hemodialysis and improves their health literacy.

Key words: Continuous nursing; Hemodialysis self-management ability (HSMA); Urinaemia; “Internet Plus”; Health Literacy

Hemodialysis is a kidney replacement therapy for patients with uremia, which can effectively remove metabolic waste in the body and correct the chaos in the body. At present, the number of patients using hemodialysis worldwide every year is increasing at a rate of 10% [1], and the quality of life of such patients is receiving increasing attention. According to the Research Report [2], the quality of life of uremic hemodialysis patients (hereinafter referred to as HPU) is closely related to their self-management ability. Hemodialysis self-management ability (hereinafter referred to as HSMA) is a kind of self-care ability for patients with chronic diseases [3]. In recent years, the status of continuous nursing for patients with chronic diseases has gradually become prominent, However, routine continuous nursing is in a form, with a single method and limited content, which cannot meet the patient's HSMA requirements. Self-management oriented care is a nursing model that reduces the impact of diseases on their own body and social functions by strengthening patients' self-protection [4]. “Internet Plus”health service uses “Internet Plus”as the carrier, and information technology plays an important role in meeting people's health needs [5]. Therefore, the author combines self-management oriented and “Internet Plus” technology in the continuous nursing of HPU, and evaluates its impact on HSMA and countermeasures of hemodialysis patients with uremia. The implementation method and effect are reported as follows.

1. Information and methods

1.1 Sources of information

60 cases of HUP treated in the hospital from January to December 2018 were selected as the control group (Take routine continuous nursing intervention), In addition, the

60 HUP cases admitted

between January and December 2019 were selected as the observation group (using “Internet Plus” oriented continuous nursing intervention). Evaluate its impact on the HSMA of HUP.

The inclusion criteria were as follows: (1) the hemodialysis indications of the two groups who meet the requirements of the Diagnostic Standard for Uremia [6] , (2) Self-willing participants in the researchers, (3) The age is $\geq 18 \sim < 75$ years old , (4) People with the first hemodialysis, regular dialysis, hemodialysis age ≥ 3 months, (5) People with a primary school or above, (6) Those who have smartphones and can use WeChat, (7) Person with complete clinical data, (8) The resolution ability and ditch communication ability are normal, and those who can cooperate with those who complete relevant questionnaires.

Exclude case standards, exclude (1) Those with serious complications, (2) Kidney transplantation, peritoneal permeability, (3) People with mental illness, (4) Patients with malignant tumors, (5) People with severe malnutrition, (6) People who are bedridden and restricted in walking, (7) People with severe cardiovascular and cerebrovascular diseases, nephropathy and osteopathy, etc. The difference between the general data of the two groups is not statistically significant ($P > 0.05$), which have comparability. The clinical data of the two groups are shown in Figure 1.

Figure 1 Comparison of clinical data between the two groups (n/case, %)

Date and Variable Values	Observation Group (n=60)	Control Group (n=60)	t/x ² Value	P Value	
Sex	Male	32(53.33)	35(58.33)	0.132	>0.05
	Female	28(46.67)	25(41.67)		
Age (t/Year)		51.52±13.34	52.24±15.25	0.275	>0.05
Course and disease (t/Year)		2.42±1.17	2.21±1.24	0.954	>0.05
BMI	< 18.5	12(20.00)	13(21.67)	1.086	>0.05
	$\geq 18.5-24.0$	42(70.00)	44(73.33)		
	≥ 24.0	6(10.00)	3(5.00)		
The Primary disease	Hypertension nephropathy	22(36.67)	23(38.33)	1.175	>0.05
	Diabetic nephropathy	18(30.00)	20(33.33)		
	Chronic glomerulonephritis	10(16.67)	11(18.33)		
	Polycystic kidney	10(16.67)	6(10.00)		
Marital status	unmarried	4(6.67)	3(5.00)	0.253	>0.05
	Married	48(80.00)	50(83.33)		
	Divorce or widowhood	8(13.33)	7(11.67)		
Degree of education	Junior high school	39(65.00)	35(58.33)	0.602	>0.05
	Senior school	12(20.00)	15(25.00)		
	Junior college or above	9(15.00)	10(16.67)		

1.2 Method

Both groups of patients routinely gave heparin anticoagulant, using low calcium dialysis solution (Ca^{2+} concentration 1.5 mmol/L), blood flow 200~250 mL/min, dialysis time 4 h/time, 3 times a week, and given anti-infection, blood pressure control, adequate vitamins, phosphorus binders and essential amino acids. On this basis, the patients in the control group were given routine nursing, in-hospital routine nursing, monitoring vital signs and health education, and patients are ordered to dialysis on time and regular re-examination, telephone follow-up is used outside the hospital to guide patients to drink reasonably, follow the doctor's instructions, protect vascular pathways, prevent complications, etc.

Patients in the observation group adopted self-managed “Internet+” oriented continuous nursing intervention, which is as follows:

1.1.1 Establishment of a self-management team

(a) The head nurse is the leader, and the team members are five nurses, in addition to one clinician. Based on the principle of voluntariness, team members are recruited, requiring team members to have a nursing age of ≥ 5 years, good communication skills and excellent professional quality. After the establishment of the group, the group focused on learning hemodialysis, continuous nursing, self-management, Internet medicine and other related knowledge,

continuous nursing, self-management, Internet medicine and other related knowledge, and was familiar with the operation ability. Meetings are held to launch a "brainstorming". Eventually, the head nurse is responsible for formulating the nursing plan and supervising the quality of care. The team members are responsible for the whole process of patient consultation, nursing and follow-up, and the clinician is responsible for the formulation of the patient's dialysis plan. (b) Guide patients to download the doctor-patient service platform APP on their mobile phones, and invite them to join the WeChat group to explain the composition and use of the APP section.

1.1.2 Self-management-oriented care

The content is as follows: (1) Inquiries and evaluation, the nurse in charge of the self-management team will check the general information of the patient (diagnosis, past medical history, treatment history, test results and dialysis plans, etc.). carry out effective interviews with patients, and ask questions related to uremia, hemodialysis, self-management, etc., which will be answered by patients. Assess the patient's disease, disease cognition, hemodialysis cognition, HSMA for about 20 minutes. The nurse in charge should carefully record the information obtained in the interview and communication.

(2) It is suggested that according to the results of inquiry and evaluation, the misconceptions and behaviors of patients related to uremia and hemodialysis are listed one by one, emphasizing the important role of self-management in hemodialysis treatment results and disease prognosis, so as to attract patients' attention to self-management and healthy lifestyle, from the subjective consciousness, mobilize patients to carry out self-management and correct bad lifestyle behavior. At the same time, work with patients to formulate health science goals and self-management goals at each stage, and sign contracts with patients to enable patients to self-assess the completion of the plan.

(3) To help guide the "Internet plus" APP is as follows: (a) Doctor-patient service platform APP, which consists of 5 modules: teaching classroom, information inquiry, drug purchase prescription, online appointment, and my information, among them, the teaching class is a video explanation. Professionals are responsible for video recording (SLR digital cameras), nurses explain dubbing, and are equipped with soothing and soft music. The patient's propaganda content is divided into 5 stages, diagnosis period, hospitalization period, discharge preparation period, adjustment period and adaptation period [7], which are divided into health knowledge in their respective periods, and they are asked to watch it by themselves. In addition, the mission module also includes two parts: companion education and patient experience. Information inquiries include inspection reports, consumption details, physical examination reports, etc.; drug purchase prescriptions include drug types, doses, prices, etc., online appointments include online bookings, WeChat consultation and telephone consultation; and there is a human resources, appointment record, physical examination report, dialysis record, etc. in the "my" module. The APP supports the connection of the body mass scale.

(a) The application of the WeChat group is to form a "kidney friend" WeChat group. Each WeChat group has a team member as the administrator. The administrator guides the patients in this group to carry out problem based self-management learning and increase the interaction between doctors and patients.

(b) For quality monitoring, team members can check patients' online learning through the APP and send messages through the APP to remind patients to learn according to the photo. Instruct patients to send daily learning plans and nursing operations to the WeChat group, evaluate patients self-management in the form of interactive questions and answers, and give individualized and targeted guidance according to the assessment situation.

(c) For quality monitoring, team members can check patients' online learning through the APP and send messages through the APP to remind patients to learn according to the photo. Instruct patients to send daily learning plans and nursing operations to the We Chat group, evaluate patients' self-management in the form of interactive questions and answers, and give individualized and targeted guidance according to the assessment situation.

(d) Emotional support, in addition to promoting patients to play a peer support role, also provides psychological counseling for patients according to the attribution, through We Chat, telephone.

(4) Follow-up, through We Chat group follow-up, patients are required to report their learning status every day after being discharged from the hospital. The nurse in charge provides health consultation (2 times/week), answers patients' questions, gives personalized counseling, and corrects patients' unreasonable and unscientific habits. Understand the patient's condition, self-management, complications, etc., analyze the current situation, and modify the nursing plan. For patients who come to the hospital for follow-up, the nurses on duty in the group communicate face to face to evaluate the recovery of patients after discharge from the hospital, and give guidance according to the evaluation results.

1.3 Observation indicators

(1) Rating of self-management ability. In the three months before and after the dry prognosis, the self-management scale for hemodialysis (self-management scale for hemodialysis ,SMSH)^[8] developed by Song Yijun was used for investigation. The content of the scale (executed from my care, partnership, emotional management, problem solving) has seven, four, four and five entries, each of which has four options: never (1 point), occasionally (2 points), often (3 points), always (4 points). The total score is 20-80. The higher the score, the better the patient's self-management behavior. Cronbach's of the scale $\alpha = 0.872$ of the scale, and the reliability is 0.863.

(2) Score of health Literacy. questionnaire on health literacy of chronic patients (CPHL)^[9] developed by Sun Haolin was used to investigate before and 3 months after intervention. The questionnaire contains four contents (change of health willingness, interest acquisition ability, willingness to financial support, communication and interaction ability), with 4, 9, 2 and 9 entries, with a total of 24 entries. Each entry adopts a 5 level scoring method, that is: 1 to 5 points, with a total score of 24 to 120 points. The higher the score, the higher the patient's willingness in this regard. The Cronbach's $\alpha=0.851$ of the questionnaire , and the retest reliability is 0.775.

1.4 Statistics method

Using SPSS version 20.0 statistical software analysis, the relevant data are input and checked by two people. The resulting data are represented by examples (n) and percentage (%) and mean value \pm standard error ($\bar{x}\pm s$). The comparison of differences between groups is tested by χ^2/t , and $P<0.05$ means that the differences are statistically significant.

2.1 Comparison of SMSH scores of HSMA before and after intervention in two groups of patients

The HSMA scoring values of the two groups of patients before intervention were not statistically significant ($P>0.05$). After intervention, the scores of various dimensions of SMSH were higher than the scores of problem solving, emotional processing, execution of self-management, etc., but after the intervention of patients in the observation group in the control group ($P<0.05$). The score is shown in Figure 2.

Figure 2 Comparison of SMSH score of HSMA between the two groups before and after intervention ($\bar{x}\pm s$)

Group	problem solving (point)		partnership (point)		perform self nursing (point)		emotional processing (point)	
	before intervention	after intervention	before intervention	after intervention	before intervention	after intervention	before intervention	after intervention
observation group	14.32 \pm 2.95	15.78 \pm 3.02 ¹⁷²	11.59 \pm 3.21	13.59 \pm 2.45 ¹⁷²	19.73 \pm 4.16	21.83 \pm 3.12 ¹⁷²	9.86 \pm 2.53	11.92 \pm 2.14 ¹⁷²
control group	13.83 \pm 3.26	14.53 \pm 3.17 ¹⁷¹	12.04 \pm 2.93	12.24 \pm 2.86 ¹⁷¹	19.15 \pm 4.72	19.91 \pm 3.67 ¹⁷¹	9.46 \pm 2.17	10.25 \pm 4.18 ¹⁷¹
t value	1.004	2.211	0.802	2.777	0.714	3.087	0.930	2.755
p value	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

2.2 Comparison of health literacy CPHL scores of two groups of patients before and after intervention

The results of health literacy analysis showed that the differences between the CPHL scores of the two groups before intervention were not statistically significant ($P>0.05$), and the scores of each dimension of CPHL increased to varying degrees after intervention, however, the scores of health literacy such as information access, improved health willingness, and communication interaction ability are higher than the comparison ($P<0.05$). The CPHL scores of various dimensions of health literacy before and after intervention are shown in Figure 3.

Figure 3 Comparison of CPHL score of health literacy between the two groups before and after intervention ($\bar{x}\pm s$)

group	Information acquire skill (point)		Communication and interaction ability (point)		Improve health willingness (point)		economy support willingness (point)	
	before intervention	after intervention	before intervention	after intervention	before intervention	after intervention	before intervention	after intervention
observation group	31.28±5.27	35.26±6.12 ^{*1,2}	31.23±4.56	36.91±7.4 ^{*1,2}	14.12±1.23	18.37±2.02 ^{*1,2}	8.11±1.03	9.14±0.57 ^{*1,2}
control group	30.71±5.16	31.37±9.52 ^{*1}	30.72±4.75	32.56±5.82 ^{*1}	13.85±1.34	16.38±1.74 ^{*1}	7.89±1.21	8.45±0.71 ^{*1}
t value	0.599	2.662	0.600	3.784	1.150	6.828	1.072	5.870
p value	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05	>0.05	<0.05

3. Discussion

The long treatment time, many complications, limited cognition and high medical expenses of HPU significantly increase the difficulty of self-management. Regular dialysis causes patients to lose normal life rules and interests and reduce social activities, which can easily lead patients to gradually lose confidence in treatment and affect the treatment effect, thus accelerating the process of kidney failure^[10]. Cardiovascular diseases are the cause of the high fatality rate of hemodialysis patients, and an important factor associated with it is the low level of self-management in most patients^[11]. According to a survey study such as Wu Lingna^[12], the self-management level of HPU is not ideal, with an average score of 47.81, which is at the middle and lower level. HSMA is an active behavior taken by an individual to survive and maintain and improve health, including symptom control, treatment monitoring, behavior. It can highlight the patient's conscious initiative and actively participate in its own disease management. Orem's self-nursing theory considers that everyone needs self-nursing^[13]. Wang Fangfang and others found that^[14], the better the hsma of HPU, the better its ability to integrate favorable medical resources and the higher the quality of life. The purpose of nursing is to help patients develop their maximum potential so that they can take care of themselves. Continuous nursing is an important method to improve the HSMA and quality of life of HPU^[15]. However, at present, there is a serious shortage of medical and health resources in China, and it is very difficult to rely on face to face, one by one continuous nursing of medical workers. With the arrival of the Internet times and the popularity of smart phones, the application of Internet technology in patients' out of hospital management is gradually promoted, which can make up for the inconvenience caused by traditional telephone and family visit.

The results of this paper showed that compared with routine continuous nursing, the scores of self management "Internet plus" oriented continuous nursing intervention significantly improved the scores in problem solving, emotional management, self management and other aspects ($P<0.05$). Based on the "Internet plus", the extension service guides patients to download mobile APP, which provides propaganda class, online consultation and other services, and has great development prospects in hemodialysis^[16]. This model is not limited by time and space. Through the platform, patients can learn self-management knowledge anytime and anywhere, avoiding the forgetting of patients' oral health education knowledge in routine continuous care over time. Moreover, patients can learn self-management knowledge through APP according to their personal needs, which meets the needs of specialized management information and strengthens self-management ability. At the same time, the application of mobile app enables patients to keep in touch with doctors and medical workers in time, and medical workers can timely

understand the patient's disease status, vascular access, whether there are complications and problems in self-care, further health education and self nursing skills training for patients have improved the pertinence and practicability of intervention. We Chat is an instant messaging APP based on "Internet plus" technology. It has many audiences in China and a wide range of popularity in China. The application of WeChat group builds a bridge between nurses and patients, patients and patients. By uploading learning plans every day, achieving supervision effect, which is beneficial to improve patients' sense of responsibility for their own health. Moreover, wechat group enables patients to have a common home. Through communicate with each other, it can reduce the psychological pressure of patients caused by stoma to a certain extent. In order to improve the individualization and pertinence of "Internet plus" continuous nursing, we should reduce the combination of self-management oriented nursing mode. Self management oriented nursing is a nursing model rising in bed in recent years. It is people-oriented, aims to enhance patients' cognitive level and management ability of disease through a variety of means, and takes improving prognosis as the ultimate goal[17]. Self management oriented nursing, based on the situation obtained from patient consultation and evaluation, analyzes the problems in the treatment and rehabilitation of hemodialysis patients at different stages, puts forward suggestions and help for patients, and helps to promote the transformation of patients' final health behavior and improve their self-management ability by formulating phased learning goals. Cong Jinmei and other researchers have shown that[18], self-management oriented nursing can improve the self-management ability of hemodialysis patients to improve tired condition. This nursing model focuses on effect evaluation, which is positively helpful for strengthening dialysis health knowledge and promoting the formation of self-management ability.

The reaserch of this study also showed that compared with the routine continuous nursing, the scores of patients in terms of health literacy such as the ability of gain information, improve health willingness, communication and interaction ability after the continuous nursing intervention of self-management oriented " Internet Plus " application are worth significantly increased ($P < 0.05$). Health quality refers to the ability of patients to improve their health through cognitive and social skills. Wang Xue and other researchers believe that[19], there is a positive correlation between the health literacy and self-management ability of hemodialysis patients. Zhou Meiling and others found that[20], improving the self-management ability of hemodialysis patients is beneficial to improve their health literacy. The implementation of self-management oriented nursing model makes patients fully realize that they are the center of disease control and management, guides patients to actively participate in the plan of behavior change, stimulates their sense of responsibility for their own health, realizes cognitive reconstruction, and maintains this behavior, in order to improve HPU health literacy and hemodialysis self-management ability.

Reference:

- [1] Rajva- saran MD, Bruce- robinson MD, Kevin C, et al. US renal data system 2018 annual data report:epidemiology of kidney disease in the United States[J]. American J Kidney Dis, 2019, 73 (3):7-8.
- [2] Hu Fang, Feng Wanjuan, Fang Jiao, etc. Analysis of the relevant factors affecting the life and sleep quality of patients with end-stage uremia [J]. Clinical Medical Research, 2019, 36 (5) :869 - 872. (in Chinese)
- [3] Diao He, Li Xiangyu, Ji Miaoyin, etc. Advances in self-management of patients with maintenance hemodialysis [J]. Clinical Nursing in China, 2019, 11 (6): 542-545. (in Chinese)
- [4] Wang Liming. Application of self-management-oriented 5A care model in patients with ovarian cancer [J]. General Care, 2016, 14(12): 1194-1196. (in Chinese)
- [5] Huang Zhijie, Zhang Xuejiao, Chen Baoxin, etc. Study on the multi-level linear model of the willingness of community medical staff to use "Internet Plus" chronic disease management [J]. China's general science, 2019, 22 (28) :3432 - 3437 . (in Chinese)

- [6] Ge Junbo, Xu Yongjian. Internal Medicine: 8th Edition [M]. Beijing: People's Health Publishing House, 2004:524. (in Chinese)
- [7] Yan Biyan, Mai Cuifang, Yang Weihong. Application of TIR-based continuous nursing in hemodialysis patients [J]. Qilu Nursing Magazine, 2019, 25 (21): 80-83. (in Chinese)
- [8] Song Yijun. Construction and testing of the self-management scale for hemodialysis patients [M]. Kaohsiung: Kaohsiung Medical University, 2009. (in Chinese)
- [9] Sun Haolin. Research on the Health Literacy Scale for Patients with Chronic Diseases and its Preliminary Application [D]. Shanghai: Fudan University, 2012. (in Chinese)
- [10] Yan Xiaoying, Zheng Lin, Zhou Jinmei. The impact of authorized health education on self-efficacy and self-management of patients with maintenance hemodialysis [J]. China Health Education, 2018, 34 (5): 452-455. (in Chinese)
- [11] Feng Yanping. Application of self-management intervention in maintenance hemodialysis in patients with hypertension [J]. Journal of Qilu Nursing, 2016,22(3):28-30. (in Chinese)
- [12] Wu Lingna, Han Jiming, Wang Jin. Investigation and study on the current situation of self-management of hemodialysis patients in Yan'an [J]. Shaanxi Medical Journal, 2019, 48(6):810-812. (in Chinese)
- [13] Lin Guimei, Deng Yuanyu, Li Cuiling. Application of Orem self-care model in the continuous nursing of patients with chronic renal failure and peritoneal dialysis [J]. Nursing care integrated with traditional Chinese and Western medicine: Chinese and English, 2019, 5 (2) :135 - 138. (in Chinese)
- [14] Wang Fangfang, Wu Di, Sui Xue, etc. Influence of group education based on interactive analysis model on the self-management of middle-aged hemodialysis patients [J]. Nursing Miscellaneous Chronicles, 2016, 31(23):80- 82. (in Chinese)
- [15] Ouyang Yan, Fan Meirong. Influence of continuous nursing on the self-management ability and quality of life of hemodialysis patients [J]. General Care, 2018, 16 (16):2026-2028. (in Chinese)
- [16] Zhang Ping, Yang Linan, Ruan Yizhe, etc. Investigation on the use of the Internet in patients with maintenance hemodialysis [J]. Southwest National Medicine, 2016, 26(3):346-348. (in Chinese)
- [17] Lin Yamei, Zhu Meijuan, Hong Man, etc. Application of Internet + self-management-oriented 5A care model in patients with maintenance hemodialysis [J]. Guangdong Medicine, 2018, 39 (8) :1260 - 1263 (in Chinese)
- [18] Cong Jinmei, Cao Yun, Zhang Xiaoping, etc. Influence of self-management-oriented Internet 5A care model on the quality of life and fatigue of patients with maintenance hemodialysis [J]. Nursing Practice and Research, 2019, 16 (22):59-61. (in Chinese)
- [19] Wang Xue, Zhang Yingjun, Yuan Huaihong, etc. Correlation analysis of health literacy, self-management and self-efficacy in patients with maintenance hemodialysis [J]. Chinese Blood Purification, 2019, 18 (7) :509 - 512.(in Chinese)
- [20] Zhou Meiling, Xu Xiujun, Chen Yanfang, etc. Influence of motivational interviews on self-management ability and health literacy of maintenance hemodialysis patients [J]. Nursing and Rehabilitation, 2019, 18 (1) :20 - 23. (in Chinese)

