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Analysis of the Effects of the WeChat Health Management Platform on the Self-care Ability and Quality of Life of Patients with Liver Cancer Undergoing Interventional Therapy

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Abstract

Background: With the popularity of WeChat, Internet-based nursing approaches are gradually being applied to disease care, as they can better meet nursing requirements.

Objectives: To explore the impact of the WeChat health management platform on the self-care ability and quality of life of patients with liver cancer undergoing interventional therapy

Methods: A total of 82 patients with liver cancer who underwent interventional therapy were selected from January 2020 to January 2021 and randomly divided into the observation (n = 41) and control (n = 41) groups. The control group received routine nursing measures, while the observation group received the new nursing mode based on the WeChat health management platform. The WeChat health management platform can help patients develop health education plans, remind them of follow-up appointments, promote knowledge about nursing measures for liver cancer interventional therapies, provide feedback on medication use to doctors, and strengthen doctor–patient communication. The self-care ability and quality of life of the two groups of patients were compared before and after the intervention.

Results: After the intervention, the Hamilton Anxiety Scale (HAMA) and Hamilton Rating Scale for Depression (HAMD) scores were lower in the patients of the observation group than those in the control group, indicating an improvement in the adverse moods and quality of life of patients in the observation group. Also, the psychological, physical, and social functions and overall health scores of patients in the observation group were higher than those in the control group (all P-values < 0.05).

Conclusions: The WeChat health management platform could improve the self-care ability of liver cancer patients undergoing interventional therapy and their mood and quality of life, which is worthy of clinical reference.

Keywords: Liver Cancer, Interventional Therapy, Self-care Ability, Negative Emotion, Quality of Life, WeChat Health Management Platform

1. Background

Liver cancer is a common neoplastic disease of the digestive system, and its occurrence is closely related to patients' environment and diet (1). Although studies have found that genetics, diet, and viral hepatitis are the main causes of liver cancer (2), the exact pathogenesis of this condition remains elusive. Considering the aging population of China, the incidence of liver cancer is expected to rise, a disease showing a high fatality rate, as well as a higher incidence in males than in females (3).

Liver cancer patients are mostly treated using interventional surgery and tend to experience a serious decline in quality of life after undergoing one interventional therapy (4, 5). Liver cancer is an insidious disease in its early stages when most patients have no obvious clinical symptoms, such as diarrhea and fatigue (6). As a result, it is frequently overlooked and not detected until advanced stages, when the golden time for surgery has been missed. With the improvement of medical standards, many liver cancer patients are turning to interventional surgery. However, due to a limited understanding of the disease and uncertain outcomes after interventional surgery, patients are prone to anxiety and adverse mood. Moreover, most patients with liver

cancer are old people with poor self-care abilities. This reduces their cooperation in treatment and nursing care, adversely affecting therapeutic outcomes and quality of life (7) and subsequently leading to a vicious cycle of undesirable treatment effects (8, 9). Hence, it is crucial to improve the self-care ability of such patients and provide them with effective care (10).

At present, home care for elderly patients in China is usually provided by their families and community nurses, but due to the shortages of community care and human resources, public demand for home care usually remains unmet, especially for elderly patients suffering from cancer (11). At the same time, because community nursing is not effectively linked with large hospitals where patients are treated, community care programs lack the expected beneficial role in patient follow-ups' and medication plan adjustments (12). WeChat, an Internet-based nursing approach that is gradually applied to disease care, can better manage nursing requirements (13). The new model of an Internet-based nursing approach refers to the use of mobile Internet and smartphones to provide convenient and effective home-care services for elderly patients and effectively meet the home-care needs of elderly patients. This process is supervised by the governmental health administration department, and service standards are formulated to ensure the quality of nursing services provided (14).

2. Objectives

The purpose of this study was to explore the impact of the WeChat health management platform based on mobile Internet on the postoperative care management of patients with liver cancer undergoing interventional therapy. This study's results can provide a reference for clinical nursing professionals, as well as a basis for health administrative departments, to formulate effective home care service policies for elderly patients.

3. Methods

1.1. General Data

Eighty-two patients with liver cancer undergoing interventional therapy, including trans-arterial chemoembolization, trans-arterial bland embolization, trans-arterial radioembolization, and trans-arterial chemotherapy infusion, in Shanxi Bethune Hospital, Shanxi Academy of Medical Sciences from January 2020 to January 2021 were enrolled as research subjects, all of whom met the diagnostic criteria for liver cancer (15). The subjects were randomly divided into the observation (n = 41) and control (n = 41) groups. The control group received routine nursing care, while the observation group benefited from the WeChat health management platform. Inclusion criteria were: (1) being diagnosed with liver cancer based on pathology findings; (2) having stage III or IV liver cancer; (3) having a stable postoperative condition with an estimated survival of >3 months; and (4) being aware of the research results, and (5) providing informed consent. Exclusion criteria were: (1) the presence of other comorbidities, such as severe cardiovascular and cerebrovascular diseases, severe infections, and uncontrolled diabetes or hypertension; (2) incomplete case data; and (3) the presence of communication barriers or disapproval of the research content.

Randomization was carried out on a 1:1 ratio using a computer-based random-sequence generator. The final randomization protocol was carried out by an independent researcher who was not involved in patient recruitment and data collection, and the results were recorded in the electronic data collection database of the study.

3.2. Methodology

All patients with liver cancer were treated with interventional surgery. After the surgery, the patients of the control group underwent routine nursing care and were advised on proper diet and rest, and their family members were instructed to supervise and guide the patients' adherence to using medications and doing reasonable exercise in accordance with their physical condition. Appointed nursing staff made regular telephone check-ins to inquire about the patient's condition and adherence to medication use, as well as to provide corresponding advice and answer their questions.

Patients with liver cancer in the observation group benefited from the WeChat health management platform, including (1) the establishment of a health management guidance group, which consisted of two physicians, three cardiology nursing staff, and two psychological nurse practitioners; (2) the creation of a WeChat group chat, where the physicians and nursing staff shared knowledge and discussed with patients or their families about the interventional therapy, liver cancer, and care measures. The nursing staff prepared and sent messages to the group after the physicians' reviews. Also, the nurses regularly learned about the patients' conditions and medication status from the patients and their families, provided

reasonable advice to them, and fed this information back to relevant doctors. Typical cases and possible common problems of the patients were organized and sent to the group for the patients and their families to understand. Depending on the patient's physical condition, exercise plans were instructed, and professional answers were provided on an individual basis. The patients and their families were encouraged to discuss their concerning issues in the group. The nursing staff made records, integrated various inaccurate operations and omissions of patients' daily medication and home care, and explained them to the patients in the group via voice messages. Every 2 weeks, the nursing staff organized the error-prone points and key knowledge, made a video, and sent it to the group to increase the patients' and their families' understanding, cognition, and self-care abilities. (3) Psychological nurse practitioners helped the patients with their adverse moods, such as irritability and anxiety caused by the long-term use of medications. Instead of simply telling patients the importance of mentality to their treatment from a professional perspective, they started to divulge the patient's interests and offered them professional psychological guidance to increase patients' acceptance and identification with psychological counseling and therapeutic care. Both routine nursing and the WeChat platform-based management continued for three months.

3.3. Evaluation and Measurements

The duration of the observation period was 6 months, and the outcomes were measured before and after the intervention.

(1) The Self-care Ability Scale (16) was adopted to compare the self-care ability between the two groups of liver cancer patients undergoing interventional therapy before and after the intervention in terms of health awareness, self-care skills, sense of responsibility, and overall rating. Each dimension was scored from 0 to 25, with higher scores indicating greater self-care ability.

(2) Hamilton Anxiety Scale (HAMA) and Hamilton Rating Scale for Depression (HAMD) (17) were adopted to gather the data of liver cancer patients undergoing interventional therapy in the two study groups before and after the intervention. Both scales have an overall score of 0-30, with higher scores indicating more negative emotions such as anxiety and depression.

(3) Quality of life-30 scale (QOL-30 scale) (18) was adopted to record the data of liver cancer patients undergoing interventional therapy in the two study groups before and after the intervention, including psychological function, physical function, social function, and overall health. Each dimension was scored from 0 to 100, with higher scores indicating a better visual quality of life.

3.4. Statistical Methods

Data analysis was performed using the statistical software of SPSS 22.0. Continuous variables with normal distribution were expressed as mean ± standard deviation. The independent t-test was used for inter-group comparisons, and the paired t-test was used for intra-group comparisons. Further, the chi-squared test was used to compare categorical variables between the study groups. All tests were two-tailed at a significance level of $P < 0.05$.

4. Results

4.1. Comparison of Background Data

In the control group, there were 31 males and 10 females, with a mean age of 57.27 ± 4.01 years and a mean body mass index (BMI) of 22.81 ± 3.71 kg/m^2. In the observation group, there were 30 males and 11 females, with a mean age of 57.19 ± 3.92 years and an average BMI of 22.36 ± 4.02 kg/m^2. The two groups were comparable in terms of all background variables (all with $P > 0.05$). The focal diameter was not significantly different between liver cancer patients undergoing interventional therapy in the two groups ($P > 0.05$) (Table 1).

4.2. Comparison of Self-care Ability Before and After Intervention

Before the intervention, there was no significant difference in the scores of self-care skills, sense of responsibility, and other self-care abilities between the two groups of liver cancer patients undergoing interventional therapy ($P > 0.05$). After the intervention, patients in the observation group had higher scores of health awareness (21.46 ± 2.12 vs. 18.98 ± 2.53, $P = 0.041$), self-care skills (22.27 ± 1.65 vs. 17.19 ± 1.53, $P = 0.037$), sense of responsibility (22.21 ± 1.75 vs. 18.83 ± 1.19, $P = 0.025$), and overall rating (23.34 ± 1.35 vs. 19.96 ± 1.48, $P = 0.037$) compared with those in the control group (see Table 2).

Table 1. Comparison of General Data of Liver Cancer Patients Between the 2 Study Groups

Variables	Control Group (n = 41)	Observation Group (n = 41)	X^2/t	P-Value
Gender			0.150	0.750
Male	31	30		
Female	10	11		
Age, y	57.27 ± 4.01	57.19 ± 3.92	-0.342	0.613
Child grade			0.045	0.833
Grade A	26	23		
Grade B	15	18		
BMI, kg/m^2	22.81 ± 3.71	22.36 ± 4.02	0.520	0.604
Residency			0.352	0.553
City	26	20		
Village	15	21		
Focal diameter, cm	5.54 ± 1.32	5.68 ± 1.43	0.746	0.324
Primary caregiver			0.234	0.898
Spouse	29	28		
Offspring	7	6		
Others	5	7		
Education			0.045	0.961
Junior high school or lower	14	10		
Senior high school	22	24		
Bachelor's degree or higher	5	7		
Marital status			0.558	0.756
Unmarried	5	7		
Married	26	22		
Divorced/widowed	10	12		

Table 2. Comparison of Self-care Ability Scores (Mean ± SD, n = 41)

Groups	Health Awareness		Self-care Skills		Sense of Responsibility		Overall Rating	
	B	A	B	A	B	A	B	A
Control	15.43 ± 2.25	18.98 ± 2.53	13.96 ± 1.21	17.19 ± 1.53	14.29 ± 1.27	18.83 ± 1.19	16.74 ± 1.38	19.96 ± 1.48
Observation	15.44 ± 2.26	21.46 ± 2.12	13.97 ± 1.22	22.27 ± 1.65	14.28 ± 1.26	22.21 ± 1.75	16.69 ± 1.36	23.34 ± 1.35
t	1.362	2.607	1.569	3.776	2.092	3.825	2.378	3.769
P	0.872	0.041	0.790	0.037	0.893	0.025	0.845	0.037

[a] B, before intervention; A, after intervention

4.3. Comparison of the HAMA and HAMD Scores Between the 2 Groups

Before the intervention, there was no significant difference in the HAMA and HAMD scores between the two groups of patients with liver cancer undergoing interventional therapy ($P > 0.05$). After the intervention, patients in the observation group had lower HAMA (9.26 ± 1.35 vs. 13.98 ± 1.71, $P = 0.013$) and HAMD (8.51 ± 1.34 vs. 12.89 ± 1.73, $P = 0.027$) scores than those in the control group (Table 3).

Table 3. Comparison of the HAMA and HAMD Scores (Mean ± SD, n = 41) Between the Two Study Groups

Groups	HAMA		HAMD	
	Before Intervention	After Intervention	Before Intervention	After Intervention
Control group	17.53 ± 2.31	13.98 ± 1.71	15.89 ± 2.08	12.89 ± 1.73
Observation group	17.54 ± 2.30	9.26 ± 1.35	16.03 ± 2.02	8.51 ± 1.34
t	1.592	3.670	2.358	3.457
P-value	0.731	0.013	0.693	0.027

Table 4. Comparison of the QOL-30 Quality of Life Score (Mean ± SD, n = 41) Between the Two Study Groups [a]

Groups	Psychological Function		Physical Function		Social Function		Overall Health	
	B	A	B	A	B	A	B	A
Control	75.61 ± 11.67	76.46 ± 12.38	63.31 ± 13.88	67.32 ± 12.77	72.54 ± 11.52	74.57 ± 11.71	71.60 ± 9.67	74.15 ± 9.01
Observation	75.66 ± 11.52	83.15 ± 10.04	63.24 ± 13.79	82.23 ± 13.06	72.58 ± 11.43	83.61 ± 10.97	71.52 ± 9.88	82.96 ± 10.12
t	1.167	3.152	1.472	3.508	1.279	2.761	1.689	3.729
P-value	0.791	0.014	0.845	0.006	0.826	0.016	0.617	0.023

[a] B, before intervention; A, after intervention

4.4. Comparison of Quality-of-Life Scores Between the 2 Groups

Before the intervention, there was no significant difference in the psychological, physical, and social functions and the overall health score between the two groups of liver cancer patients undergoing interventional therapy ($P > 0.05$). After the intervention, patients in the observation group had higher scores for psychological function (83.15 ± 10.04 vs. 76.46 ± 12.38, P = 0.014), physical function (82.23 ± 13.06 vs. 67.32 ± 12.77, P = 0.006), social function (83.61 ± 10.97 vs. 74.57 ± 11.71, P = 0.016), and overall health (82.96 ± 10.12 vs. 74.15 ± 9.01, P = 0.023) than their counterparts in the control group (Table 4).

5. Discussion

Nowadays, routine hospital care focuses on in-hospital nursing, and follow-up care is mostly done by phone (19), which of course, has many limitations. Poor follow-up care is largely responsible for the lack of effective control over the condition of patients with cancer. In this study, a WeChat health management platform was used for the management of patients with liver cancer after interventional therapy. As a common communication tool, WeChat is used in a wide range of fields. The post-discharge care of patients via WeChat is highly convenient (20, 21). According to our results, after the intervention, patients in the observation group scored higher than those in the control group in terms of their sense of responsibility and other self-care abilities. Collating knowledge and nursing measures for patients with liver cancer undergoing interventional therapy in the WeChat group enhanced the patients' understanding of their disease, corrected their misconceptions, and increased their perception of their condition. As the patient's self-care ability improves, their condition is expected to gradually become stabilized (22).

After the intervention, liver cancer patients in the observation group scored higher on the HAMD and QOL-30 scales, for example, in psychological function, compared with those in the control group, which was consistent with the findings of a study by Zhang et al. (23). The WeChat group brought patients together, and those with the same disease could easily find common feelings and grounds to bond. Psychological nursing practitioners' interventions helped them to improve their mood, stay optimistic, and pay more attention to their condition. With the enhancement of their self-care ability, the patients experienced an improvement in their quality of life as well (24, 25).

Featuring identity, liveliness, safety, and convenience during postoperative care based on the WeChat platform was highly acceptable to the patients. For this reason, this model has been used to manage and treat a variety of diseases, such as chronic obstructive pulmonary disease and postoperative radiotherapy for thyroid cancer and diabetes (26-28). Nowadays, the medical sector is adopting an "Internet +" model to conduct real-time communication via WeChat platforms, which is fast,

convenient, and efficient and can be widely used in modern nursing (29). Overall, WeChat-based nursing approaches can offer nursing staff an effective way to monitor patients.

5.1. Limitations

First, this study was conducted on a limited number of patients with liver cancer in a single hospital, and only patients undergoing interventional surgery were included. The small sample size limited our capability to conduct more comprehensive analyses. The sampling was confined by obvious geographical restrictions, and the follow-up duration was too short to compare survival outcomes. Therefore, a multi-center study with a larger sample size is needed to verify the applicability of the newly proposed Internet-based WeChat health management platform in a wide range to manage elderly patients.

5.2. Conclusions

The WeChat health management platform introduced in this study could be applied in the treatment of liver cancer patients undergoing interventional therapy and was able to improve the patient's self-care ability, reduce their adverse moods, and upgrade their quality of life at a clinically significant rate.

Footnotes

Authors' Contribution: Conception and design of the work: Li J. Data collection: Yuan YY, Chen JQ, and Wang XQ. Supervision: Li J. Analysis and interpretation of the data: Yuan YY, Chen JQ, and Wang XQ. Statistical analysis: Li J and Wang XQ. Drafting the manuscript: Li J. Critical revision of the manuscript: All authors. Approval of the final manuscript: All authors.

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Ethical Approval: This study was conducted in accordance with the Declaration of Helsinki and approved by the ethics committee of Shanxi Bethune Hospital, Shanxi Academy of Medical Sciences (No. YXLL-2023-047).

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