

Original Article

Effect of a WeChat-based perioperative nursing intervention on risk events and self-management efficacy in patients with thyroid cancer

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Received January 9, 2021; Accepted April 3, 2021; Epub July 15, 2021; Published July 30, 2021

Abstract: Objective: This study aimed to explore the effect of perioperative nursing intervention based on WeChat app on the incidence of risk events and self-management efficacy after thyroid cancer surgery. Methods: A total of 96 patients with thyroid cancer were enrolled and divided into a conventional group (n=49) receiving conventional perioperative nursing intervention and the WeChat app group (n=47) receiving WeChat-based perioperative nursing intervention plus conventional nursing. The Chinese version of Strategies Used by People to Promote Health (C-SUPPH) was used to assess self-management efficacy, and the Self-Assessment Scale for Anxiety (SAS) and the Self-Assessment Scale for Depression (SDS) were used to assess psychological status. The occurrence of risk events, changes in self-management efficacy and psychological status, and the occurrence of adverse events were compared between the two groups. Results: The risk event rate in the WeChat app group (2.13%) was significantly lower than that of the conventional group (14.29%) ($P<0.05$). Stress reduction, positive attitudes, and decision-making scores were elevated in both groups after intervention ($P<0.05$), and were significantly higher in the WeChat app group than in the conventional group ($P<0.05$). SAS and SDS scores were lower in both groups after intervention ($P<0.05$), and were significantly lower in the WeChat app group than in the conventional group ($P<0.05$). The rate of postoperative adverse reactions in the WeChat app group (31.91%) was significantly lower than that in the conventional group (73.47%) ($P<0.05$). Conclusions: WeChat app-based perioperative nursing interventions can effectively reduce risk events, improve self-management efficacy, and alleviate adverse emotions of thyroid cancer patients, leading to fewer adverse reactions.

Keywords: WeChat APP, perioperative, thyroid cancer, risk events, self-management efficacy

Introduction

Thyroid cancer is a common malignant tumor of the endocrine system and head and neck, accounting for about 0.2% to 1.0% of systemic malignant tumors, and 5.1% of head and neck malignant tumors [1]. Data show that the incidence rate of thyroid cancer is rising by 4% annually worldwide, with more cases occurring in women than men (3.3:1) [2, 3]. Thyroid cancer can be divided into differentiated and undifferentiated types. Differentiated thyroid cancer is relatively less malignant and patients have a good prognosis, with a 1- and 3-year survival rate of >90% after surgery and a 5-year survival rate of about 75% [4]. In contrast,

undifferentiated thyroid cancer usually leads to a poor prognosis, and the survival time is not long. The treatment options for thyroid cancer might include surgery, radioactive iodine (radioiodine) therapy and thyroid hormone therapy.

Differentiated type is most common. However, patients have limited knowledge of the pathogenesis and do not know what type they are suffering from. Therefore, carcinophobia may occur, leading to drug resistance in patients, which has adverse effects on treatment and prognosis. Due to the special position of thyroid gland, walking nerve and rich blood supply, surgery may cause great trauma, and patients are prone to anxiety, depression and

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other adverse emotions during the perioperative period. It has been found that the risk of anxiety in patients with malignancy is about 10% to 26% [5]. Patients with head and neck thyroid cancer are more likely to develop depression and anxiety. It was found that about 82% of them experience anxiety symptoms. If left untreated, this will aggravate the patient's condition [6]. Self-management behaviors have a positive effect on the prognosis of cancer patients, with self-management efficacy as the core of self-management. High self-management efficacy can improve patients' ability to self-manage their diseases, reduce risk events and adverse reactions arising from treatment, promote recovery, and contribute to patients' psychological well-being.

WeChat is an instant messaging platform, capable of sending text, language, pictures, and videos, with features such as inexpensive, rapid dissemination, and interactive images. WeChat APP-based perioperative nursing can enhance mutual communication among patients, so that patients can benefit from encouragement from each other, thus establishing self-confidence to overcome the disease. It also enables doctors and nurses to inform patients of disease-related knowledge and answering patients' questions through fragmented time, so that patients' negative moods can be relieved [7]. At the same time, perioperative nursing based on WeChat APP can also strengthen the communication among doctors, nurses and patients, and improve the doctor-patient relationship and patient satisfaction. However, there are few studies on the effect of perioperative nursing based on WeChat APP on the occurrence of risk events and self-management efficacy of thyroid cancer patients. For this reason, this study explored the effect of perioperative nursing intervention based on WeChat APP in patients with thyroid cancer.

Materials and methods

Baseline data

Ninety-six patients with thyroid cancer treated in our hospital from January 2018 to June 2020 were selected and divided into a conventional group (n=49) receiving conventional perioperative nursing intervention and a WeChat APP group (n=47) receiving WeChat-based perioperative nursing intervention and conventional nursing. Inclusion criteria: 1) thyroid

cancer confirmed by pathologic examination; 2) all patients underwent thyroid surgery and had no contraindications to surgery. Exclusion criteria: 1) women who were preparing for pregnancy, pregnant or breastfeeding; 2) those with severe impairment of heart, liver, kidney and other organ functions; 3) those with other malignancies; 4) those with hearing, speech impairment, mental illness, etc. and who were unable to complete this study. This study was approved by the Medical Ethics Committee. All patients or their families signed the written informed consent before participating in the study.

Methods

Conventional perioperative nursing interventions were given to the conventional group, including health education, psychological guidance, encouragement from family members, introduction to surgery-related precautions, and postoperative rehabilitation.

The WeChat app group was provided with WeChat-based perioperative nursing intervention on the basis of conventional nursing interventions. After admission, patients were invited to a WeChat group containing attending physicians, nurses, and patients with thyroid cancer. Patient could learn knowledge about the disease epidemiology, diagnosis and treatment, surgical progress, postoperative treatment and recovery of thyroid cancer. In the WeChat group, knowledge such as the characteristics of neck masses, thyroid nodules and thyroid cancer, the purpose and significance of surgical treatment, and ways to relieve psychological emotions were sent, and stories of people who had succeeded in fighting cancer as well as inspirational books were also shared. Patients could communicate with the attending physician and nursing supervisor at any time if they had questions through the WeChat group.

Observation indicators

(i) The occurrences of perioperative risk events and adverse reactions in patients were recorded. Risk events include fever, persistent elevation of blood glucose, incisional infection or non-healing wound, and hypostatic pneumonia. Adverse reactions include nausea, vomiting, and headache. (ii) Self-management efficacy was assessed using the Chinese version

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of Strategies Used by People to Promote Health (C-SUPPH) [8]. It is a 28-item scale evaluated from 3 dimensions, namely stress reduction, positive attitude, and decision-making, using a 5-point scale, with higher scores indicating greater self-efficacy. (iii) Mental status was assessed using Self-Assessment Scale for Anxiety (SAS) [9] and Self-Assessment Scale for Depression (SDS) [9], with 20 items on each scale on a 4 point Likert scale, with lower scores indicating milder anxiety and depression.

Statistical methods

All data were processed by SPSS 22.0 statistical software. All figures were created by GraphPad Prism 8 graphic software. Counted data (n, %) were examined by χ^2 test and Fisher's exact test. Measured data ($\bar{x} \pm s$) were examined by paired t test for intra-comparison, and the comparison between groups was performed by independent sample t test. Significant differences were considered at $P < 0.05$.

Results

Baseline data

According to the different ways of perioperative nursing intervention, 49 patients were divided into a conventional group and 47 patients were divided into the WeChat app group. There were 23 males and 24 females in the WeChat app group, aged 30-47 years, with the average age of (38.82±3.11) years. There were 21 males and 28 females in the conventional group, aged 32-45 years, with the average age of (39.11±2.29) years. The baseline data, such as age, gender, family history, and education level did not differ between the two groups ($P > 0.05$) (Table 1).

Occurrence of risk events

The WeChat app group had 1 case of infection or non-healing wound and 0 case of fever, persistent elevated blood glucose and hypostatic pneumonia, while the conventional group had 1 case of fever, 2 cases of persistent elevated blood glucose, 2 cases of infection or non-healing wound and 2 cases of hypostatic pneumonia. The total risk event rate in the WeChat app group was 2.13%, signifi-

cantly lower than 14.29% in the conventional group ($P < 0.05$) (Table 2).

Self-management efficacy

Stress reduction, positive attitude, and self-determination scores did not differ significantly between the two groups before intervention ($P > 0.05$). They were higher in both groups after intervention ($P < 0.05$), and significantly higher in the WeChat app group than in the conventional group ($P < 0.05$) (Table 3).

Mental state

The SAS and SDS scores were (53.29±5.27) and (52.07±6.24) in the WeChat app group, and (54.06±5.46) and (52.35±6.03) in the conventional group before intervention ($P > 0.05$). SAS and SDS were decreased in both groups after intervention ($P < 0.05$). The SAS and SDS scores were (44.92±4.75) and (41.92±5.93) in the WeChat app group, significantly lower than (51.06±4.36) and (48.33±6.24) in the conventional group ($P < 0.05$) (Figure 1).

Adverse reactions

The WeChat app group had 13 cases of nausea, 1 case of vomiting, and 1 case of headache, including 34 cases of grade 0 nausea, 8 cases of grade 1 nausea, 3 cases of grade 2 nausea, and 2 cases of grade 3 nausea. The conventional group had 24 cases of nausea, 7 cases of vomiting, and 5 cases of headache, including 25 cases of grade 0 nausea, 10 cases of grade 1 nausea, 8 cases of grade 2 nausea, and 6 cases of grade 3 nausea. The post-operative adverse reaction rate was 31.91% in the WeChat app group, significantly lower than 73.47% in the conventional group ($P < 0.05$); the incidence of grade 0 nausea was 72.34% in the WeChat app group, significantly higher than 51.02% in the conventional group ($P < 0.05$) (Tables 4, 5).

Discussion

Thyroid cancer is a malignant tumor, and patients will be in a constant state of stress when diagnosed, exhibiting fear, anxiety, and depression, which are not conducive to the prognosis and recovery. Strengthening perioperative health education of thyroid cancer

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Table 1. Comparison of baseline data ($\bar{x} \pm s$; n , %)

Group	Number of cases	Age	Sex		Family history of malignancy	First onset		Education level		
			Male	Female		Yes	No	Primary school and below	Middle and High School	College and above
WeChat app group	47	38.82±3.11	23 (48.94)	24 (51.06)	5 (10.64)	28 (59.57)	19 (40.43)	23 (48.94)	16 (34.04)	8 (17.02)
Conventional group	49	39.11±2.29	21 (42.86)	28 (57.14)	9 (18.37)	26 (53.06)	23 (46.94)	26 (53.06)	19 (38.78)	4 (8.16)
t		0.522		0.357	1.15		0.414		0.946	
P		0.603		0.55	0.283		0.52		0.331	

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Table 2. Comparison of adverse events (n, %)

Group	Number of cases	Fever	Persistent elevated blood glucose	Infection or non-healing wound	Hypostatic pneumonia	Total risk events
WeChat app group	47	0 (0.00)	0 (0.00)	1 (2.13)	0 (0.00)	1 (2.13)
Conventional group	49	1 (2.04)	2 (4.08)	2 (4.08)	2 (4.08)	7 (14.29)
χ^2		-	-	0.303	-	4.642
<i>P</i>		1.000*	0.495*	0.582	0.495*	0.031

Note: **P*-value by Fisher's test.

Table 3. Comparison of self-efficacy between the two groups before and after intervention ($\bar{x} \pm s$)

Group	Time point	Stress reduction	Positive Attitudes	Self-determination
WeChat app group (47)	Before intervention	29.54±6.76	39.41±9.12	8.24±2.26
	After intervention	35.43±6.39*	46.86±7.66*	11.2±2.43*
<i>t</i>		4.341	4.288	6.115
<i>P</i>		<0.001	<0.001	<0.001
Conventional group (49)	Before intervention	28.72±5.87	38.79±9.48	7.74±1.78
	After intervention	31.41±5.91	42.71±9.15	8.99±2.56
<i>t</i>		2.261	2.083	2.806
<i>P</i>		0.026	0.040	0.006

Note: *indicates comparison with the conventional group after intervention, *P*<0.05.

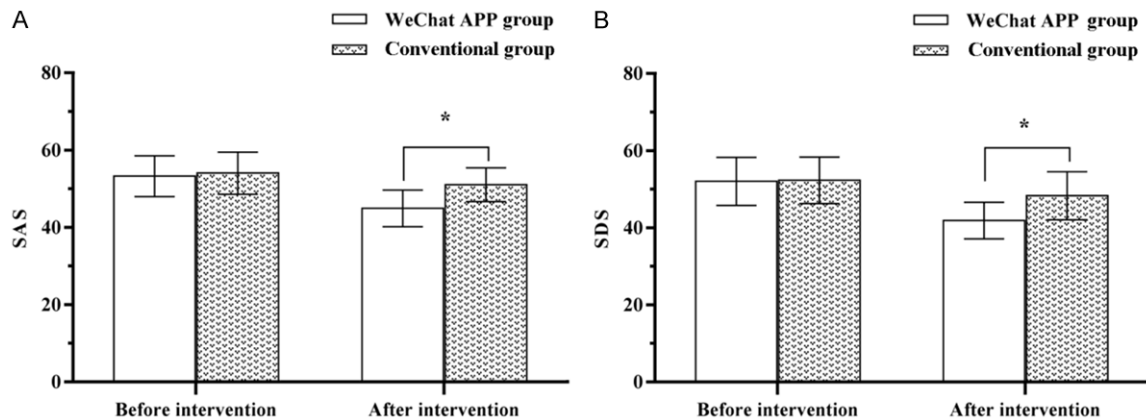


Figure 1. Comparison of SAS and SDS before and after intervention in both groups. SAS and SDS scores were not significantly different between the two groups before intervention (*P*>0.05); SAS and SDS scores in the WeChat app group were lower than those in the conventional group after intervention (*P*<0.05). A: SAS scores; B: SDS scores. * indicates comparison with the conventional group, *P*<0.05.

Table 4. Comparison of the occurrence of adverse reactions (n, %)

Group	Number of cases	Nausea	vomiting	Headache	Total adverse reactions
WeChat app group	47	13 (27.66)	1 (2.13)	1 (2.13)	15 (31.91)
Conventional group	49	24 (48.98)	7 (14.29)	5 (10.2)	36 (73.47)
χ^2		4.603	4.642	2.671	16.635
<i>P</i>		0.032	0.031	0.102	<0.001

patients and giving effective emotional and mental nursing can reduce negative emotions

and promote recovery. WeChat app is an instant social platform, and medical services

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Table 5. Comparison of the occurrence of nausea (*n*, %)

Group	Number of cases	Grade 0	Grade 1	Grade 2	Grade 3
WeChat app group	47	34 (72.34)	8 (17.02)	3 (6.38)	2 (4.26)
Conventional group	49	25 (51.02)	10 (20.41)	8 (16.33)	6 (12.24)
χ^2		4.603	0.181	2.338	2.005
<i>P</i>		0.032	0.671	0.126	0.157

based on WeChat app are used in most hospitals. This study applied nursing interventions based on WeChat app in the perioperative period of thyroid cancer patients and achieved better results.

Patients with thyroid cancer are affected by both anesthetic drugs and surgical trauma and will suffer from physiologic dysfunction, and some patients will have fever symptoms in postoperative radiotherapy [10]. Due to the great trauma of thyroid cancer surgery, the patient's body will release stress hormones, leading to a decrease of tissue sensitivity to insulin, which then causes insulin resistance (IR), and severe IR will change the energy source from glucose to fat, leading to a continuous increase in blood glucose [11, 12]. In addition, due to the large incisions, patients may have postoperative incisional infections or non-healing wound [13]. Hypostatic pneumonia is a respiratory complication caused by a variety of reasons in patients who are bedridden for a long time, and patients are afraid to cough up sputum after thyroid cancer surgery for fear that coughing will cause wound pain, which is the main reason for the occurrence of hypostatic pneumonia [14, 15]. In this study, the total risk event rate in the WeChat app group (2.13%) was significantly lower than that in the conventional group (14.29%), indicating that WeChat app-based perioperative nursing interventions can effectively reduce the occurrence of risk events in patients with thyroid cancer.

Self-efficacy, which refers to an individual's belief in his or her capacity to execute behaviors necessary to produce specific performance attainments, can help patients maintain their emotional and physical health by involving them in educational activities, enhancing their ability to take care of themselves, and making autonomous decisions in the absence of physicians and nurses. It has been shown that the Cronbach's alpha coefficient of the C-SUPPH scale is 0.849 to 0.970 and the

Guttman's split-half coefficient is 0.803 to 0.937, which is applicable to the assessment of self-efficacy in Chinese cancer patients [16]. In this study, after intervention, the pressure was reduced, the positive attitude, and the average self-decision scores were increased, and the WeChat app group was significantly higher than the conventional group. After intervention, the SAS and SDS scores were reduced, and the WeChat app group was significantly lower than the conventional group. The results of the study showed that perioperative nursing interventions based on the WeChat app can effectively improve the patients' self-efficacy. The reason may be that during the perioperative period, medical staff informed patients of thyroid cancer related knowledge and surgical precautions through WeChat, thus patients understood the disease and the importance of treatment, so that they could actively cooperate, which was beneficial to reduce negative emotions and promote prognostic recovery [17, 18]. At the same time, patients could also consult medical staff on WeChat; medical staff used fragmented time to answer patient questions, thereby reducing patient discomfort and improving negative emotions. In the information pushed by medical staff, patients could also learn nursing knowledge by themselves and improve their ability to make decisions [19, 20]. The results of this study also showed that the incidence of postoperative nausea (27.66% vs. 48.98%), vomiting (2.13% vs. 14.29%), and adverse reactions (31.91% vs. 73.47%) in the WeChat app group were significantly lower than those in the conventional group, indicating that WeChat app-based perioperative nursing intervention could reduce the incidence of postoperative adverse reactions.

In conclusion, by establishing WeChat groups containing patients, nurses, and doctors, and pushing disease-related contents and examples of overcoming cancer, perioperative nursing interventions based on WeChat app help patients establish self-confidence in overcoming

ing the disease, can effectively improve self-efficacy, thus reducing the occurrence of risk events and adverse reactions such as nausea and vomiting, as well as patients' adverse psychological emotions. However, the sample size of this study is small, and further exploration on the occurrence of adverse events with a large sample is needed. On the other hand, the intervention time still needs to be extended to observe the long-term effect of WeChat nursing intervention.

Disclosure of conflict of interest

None.

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