Am J Transl Res 2022;14(9):6389-6398
www.ajtr.org /ISSN:1943-8141/AJTR0144303

Original Article

Application of nursing intervention based on the IKAP model in self-management of patients with gastric cancer

Ling Yin[1], Wenhong Zhang[2], Lianhua Liu[3], Lihua Guo[1], Meihua Guo[3], Xiao He[1], Lixia Zhu[3]

[1]Department of Hepatobiliary and Pancreatic Surgery, The First Affiliated Hospital of Gannan Medical College, Ganzhou 341000, Jiangxi, China; [2]Department of Five Subjects of General Surgery, The First Affiliated Hospital of Gannan Medical College, Ganzhou 341000, Jiangxi, China; [3]Department of Medical Oncology, The First Affiliated Hospital of Gannan Medical College, Ganzhou 341000, Jiangxi, China

Received May 21, 2022; Accepted July 28, 2022; Epub September 15, 2022; Published September 30, 2022

Abstract: Background: To explore the effect of IKAP nursing intervention on the self-management of patients with gastric cancer, so as to improve the patient's disease management ability and healthy behaviors. Methods: In this retrospective study, a total of 124 patients with gastric cancer were included. The experimental group received the self-management intervention program for gastric cancer patients based on the IKAP model, and the control group only received routine nursing. The psychological status, quality of life, cancer-related symptoms, and self-management ability of the two groups were observed; moreover, multiple regression analysis was used to identify the risk factors of self-management. Results: The nursing intervention based on the IKAP model had obvious effects on patients with gastric cancer. The SUPPH score was improved significantly after nursing intervention in the experimental group, and the improvement was more significant as compared to control group (both $P < 0.05$). The quality of life was significantly improved in the experimental group as compared with control group. The incidence of partial cancer-related symptoms, such as infection, fatigue and recurrent peptic ulcer in the experimental group was significantly lower after nursing intervention as compared with control group (all $P < 0.05$). Moreover, the regression analysis showed that being single, divorced or separated, widowed, as well as self-management nursing intervention, and quality of life showed significant correlation with self-management behavior. The multiple regression analysis demonstrated that psychological function ($p = 0.003$) and self-management nursing intervention ($p < 0.0001$) were the independent risk factors. Conclusions: Nursing intervention based on the IKAP model for patients with gastric cancer plays a positive role in improving the self-management ability of gastric cancer patients and improving their negative emotions.

Keywords: Nursing intervention, IKAP model, self-management, gastric cancer

Introduction

Gastric cancer is the most common malignant tumor in the world, and the third most common cause of cancer related death. A survey showed that 769,000 people died of gastric cancer in the world in 2020 [1], and the death toll of gastric cancer in China was about 423,000 in 2019 [2]. Patients with gastric cancer have poor gastrointestinal function and low quality of life (QoL). Although effective treatments can prolong the survival time, a series of side effects also seriously affects the patients' QoL [3]. Surgery is the most important treatment for gastric cancer. The comprehensive treatment scheme based on surgery can effectively prolong the survival time of patients, and some early-stage patients can even achieve complete recovery [4, 5]. However, surgery is an invasive operation, which causes damage to the stomach. If the perioperative care is improper, it will affect the postoperative recovery process, increase the pain caused by the disease and surgery, and reduce the postoperative QoL of patients [6].

Information-Knowledge-Attitude-Practice (IKAP) is a health education model extended by

domestic scholars based on the theory of KAP (knowledge-attitude-belief and practice, KAP/KABP), which includes four parts: information, knowledge, belief and behavior, and it was proposed by Mayo, a professor at Harvard University in the 1950s, and developed by Gochman in his 1988 edition of health behavior [7, 8]. K. Shailaja et al. [9] proved that this method can well control blood glucose levels by improving medication behavior through KAP theory education for patients with type 2 diabetes. At present, the application of KAP theory in patients with chronic diseases is still mostly focused on the medication compliance in the fields of diabetes and hypertension, which has gradually expanded to many fields of chronic diseases, such as Alzheimer's disease [10] and breast cancer [11, 12]. Family doctors, senior practice guidance nurses and pharmacists in primary health care centers apply the IKAP model to patients with chronic diseases to help them better manage chronic diseases [13, 14]. However, there are still some problems in the application of IKAP model in cancer patients in China. First, although it is widely used in the field of cancer diseases in China, it is rarely used in the self-management of patients with gastric cancer. Second, in the application process, the application mode of IKAP mode is single, which is also reflected in the unilateral management at the medical level, and the participation of patients and their families is low. Third, in terms of application effect, although the IKAP model has been proven to play a significant role in improving patients' disease management and quality of life, there are few studies on the relationship between the IKAP model and self-management efficacy of patients with gastric cancer, and the research in this regard still needs to be further explored.

Therefore, the aim of the present study was to construct a self-management nursing intervention scheme for gastric cancer patients based on the IKAP model, so as to provide reference for better longevity and survival through improved discharge guidance for gastric cancer patients.

Materials and methods

Study design

In this retrospective study, we enrolled 124 gastric cancer patients who were treated in the First Affiliated Hospital of Gannan Medical College from January 2018 to December 2020. The patients were divided into the experimental group (n = 61) and the control group (n = 63) according to the invention mode. This study was reviewed and approved by the medical ethics committee of the First Affiliated Hospital of Gannan Medical College.

Inclusion criteria

① Patients who met the diagnostic criteria of the 2018 guidelines for the diagnosis and treatment of gastric cancer of the Chinese society of clinical oncology [15]; ② patients with an estimated survival time > 3 months; ③ patients with an age: ≥ 18 years old; ④ patients with complete epidemiological, clinical, and laboratory data.

Exclusion criteria

① Patients with blurred consciousness and mental abnormalities; ② patients with cancer metastasis; ③ patients with severe liver, kidney and other organ dysfunction; or and ④ patients with digestive system malformation.

Interventions

The control group was treated with a routine nursing mode, including admission education, education during hospitalization and unified health education at discharge, and routine follow-up after discharge. Admission and education: patients were orally informed of the ward environment and relevant rules and regulations, as well as work and rest arrangements and precautions in the ward. There was routine consultation and admission evaluation of patients. Education during hospitalization: The responsible nurse conducted oral health education to the patients during hospitalization, such as diet, drug treatment, etc. Health education at discharge: the responsible nurse orally informed the patients of precautions such as medication and exercise, regular reexamination and follow-up. Follow-up after discharge: the patient was followed up by telephone once a week after discharge to understand the basic situation of the patient after discharge and consult for possible questions. Family visit was carried out at the 1st and 3rd months after discharge, and the patients were informed that they could call and receive consultation if they

had any problem after discharge. The whole process adopted a face-to-face type of oral education.

The experimental group wase given the self-management intervention based on the IKAP model. (1) Through the preliminary questionnaire survey and comprehensive evaluation of patients, the actual cognitive status and management of patients with gastric cancer in terms of diet, work and rest, etc. were clarified, and the self-management needs of patients with gastric cancer and relevant suggestions on health education were understood. Through the comprehensive evaluation of patients, the module of health education for patients with different demographic characteristics and the way to better communicate with patients were preliminarily determined. (2) According to the previous survey and the comprehensive evaluation of patients, it was found that patients with gastric cancer lack disease-related knowledge or have a wrong understanding of self-management, and patients' understanding of disease is the basis of patients' self-management. Therefore, the first intervention during hospitalization was to explain the knowledge of gastric cancer-related diseases. (3) The daily life management of patients was guided by the combination of group lectures and one-on-one consultation, with the cooperation of responsible nurses, nutritionists and researchers. The responsible nurse first understood the patient's disease management behavior, and then explained it by means of action demonstration, video explanation or peer education in combination with the patient's confusion and according to the patient's education level and information receiving ability. (4) Patients with gastric cancer are prone to anxiety and depression, which is not conducive to disease recovery and self-management. Therefore, it is very important to give patients psychological guidance. It took two forms, of one-to-one guidance and group guidance, which were jointly completed by psychotherapists, responsible nurses and researchers. (5) Through the combination of telephone follow-up, home visit and Wechat online consultation, nurses corrected the wrong behaviors of patients and informed them of the time and content of re-examination.

Primary outcome

① Before and after nursing, strategies used by people to promote health (SUPPH) were used to evaluate self-management efficacy [16]. A 28-item scale was used to evaluate patients from 3 dimensions, namely stress reduction, positive attitude, and decision-making. Likert 5 score was used, with a total score of 28-140. Higher score represented higher self-management efficacy.

② Quality of life: The quality of life scale was investigated by the quality of life scale (QLQ-C30) developed by the European Cancer Investigation and Treatment Research Group [17], which covers six functional scales: physiological function, psychological function, physical pain, emotional function, social function and mental health. After scoring, all scale and single-item scores were linearly transformed to 0-100 points. Higher scores for functional scales and the global quality of life scale, indicate "higher level of functioning or quality of life"; while for symptom scales and single items, a higher score indicates a "higher level of symptoms or problems" [17].

③ Cancer-related symptoms change: The incidence of cancer-related symptoms, such as malnutrition, infection, fatigue, recurrent peptic ulcer, weight loss et al., was also recorded and compared.

Statistical analysis

All the data in this study were confirmed by more than two medical staff and entered into the computer. All the data in this study were processed by SPSS 19.0 statistical analysis software. Logistic regression analysis was adopted to screen the risk factors for the self-management behavior of patients. The measurement data were expressed by ($x \pm s$), and the count data were expressed by percentage (%). The general demographic data of the two groups were statistically described by descriptive analysis, and the constituent ratio of the two groups was compared by χ^2 test, the comparison between the two groups before intervention and after intervention was compared with t test. $P < 0.05$ indicated a statistically significant difference.

Results

Clinical data

Among the 124 patients with gastric cancer, the average age of the patients in the experi-

Table 1. Comparison of clinical data between the two groups

	Experimental group (n = 61)	Control group (n = 63)	t/χ^2	*P*
Age (years)	54.05 ± 6.91	51.35 ± 7.09	3.25	0.24
Gender			3.28	0.42
Male (n%)	38 (62.3%)	36 (57.1%)		
Female (n%)	23 (37.7%)	27 (42.9%)		
BMI	22.7 ± 2.28	21.4 ± 2.76	1.209	0.33
Smoking	37 (60.7%)	39 (61.9%)	1.96	0.59
Marital status			17.83	0.24
Married	23 (37.7%)	19 (30.2%)		
Single	16 (26.2%)	12 (19.0%)		
Divorced or separated	12 (19.7%)	13 (20.6%)		
Widowed	8 (13.1%)	15 (23.8%)		
Unknown/missing	2 (3.3%)	4 (6.3%)		
Classification of carcinoma			9.95	0.062
High differentiation	33 (54.1%)	39 (61.9%)		
Medium differentiation	18 (29.5%)	15 (23.8%)		
Low differentiation	10 (16.4%)	9 (14.3%)		
Staging of carcinoma			8.32	0.073
Stage I	5 (8.2%)	7 (11.1%)		
Stage II	18 (29.5%)	13 (20.6%)		
Stage III	23 (37.7%)	19 (30.2%)		
Stage IV	13 (21.3%)	19 (30.2%)		
Stage V	2 (3.3%)	5 (7.9%)		

mental group (n = 61) was (54.05 ± 6.91) years old (32-83), while that in the control group (n = 63) was (51.35 ± 7.09) years old (32-80). The BMI of the experimental group and the control group was (22.7 ± 2.28) and (21.4 ± 2.76), respectively. The number of smokers in the experimental group was 37 cases (60.7%) and that in the control group was 39 cases (61.9%). The marital status of the two groups was mostly married (37.7% vs 30.2%). There was no significant difference in gender, age, BMI, marital status, tumor stage and classification between the two groups (P > 0.05) (**Table 1**).

Comparison of the self-management efficacy between the two groups

As shown in **Table 2**, there was no significant difference in the scores of each dimension and the total score of the two groups before nursing (P > 0.05). After nursing, SUPPH scores in the experimental group were higher than those in the control group, and the difference was statistically significant (P < 0.05).

Comparison of the patient's quality of life between the two groups

The quality of life of patients (QLQ-C30) (physiological function, psychological function, physical pain, emotional function, social function, and mental health) of the experimental group improved more significantly compared with control group (P < 0.05) (**Figure 1**).

Comparison of the cancer-related symptoms between both groups

As shown in the **Table 3**, the incidence of partial cancer-related symptoms after nursing intervention in the experimental group, such as infection, fatigue and recurrent peptic ulcer were significantly lower compared with the control group (P < 0.05). However, the incidence of malnutrition and weight loss had no obvious difference between two groups after intervention (P > 0.05).

Comparison of cancer-related symptoms change between the two groups

To further investigate the symptom improvement between two groups, we counted the improvement rate and deterioration rate between two groups. As demonstrated in the **Table 4**, the improvement rate in the experimental group was 77.8%, which was obviously higher than control group (16.4%). In additional, the deterioration rate in the experimental group was 41.3%, which was decreased compared with the control group (P < 0.05). Collectively, these findings indicate that gastric cancer patients with IKAP nursing intervention could alleviate the aggravation of cancer-related symptoms.

The relation of self-management with independent variables

The influencing factors of self-management behavior of patients with gastric cancer were

Table 2. Comparison of self-management efficacy between the two groups after intervention (points, $\bar{x} \pm s$)

	time	Experimental group (n = 61)	Control group (n = 63)	t	*P*
Stress relief	Before intervention	23.37 ± 2.10	22.19 ± 2.01	0.52	0.096
	After intervention	35.63 ± 2.35	26.09 ± 2.42	5.78	0.0001
	t	24.9	5.78	-	-
	P	0.0001	0.06	-	-
Positive attitude	Before intervention	32.67 ± 2.37	32.31 ± 2.09	0.54	0.27
	After intervention	66.31 ± 2.89	44.39 ± 2.32	6.32	0.0002
	t	16.91	7.15	-	-
	P	0.0002	0.052	-	-
Decision-making	Before intervention	7.37 ± 2.10	7.19 ± 2.01	0.52	0.096
	After intervention	17.63 ± 2.35	8.09 ± 2.42	5.78	0.021
	t	24.9	5.78	-	-
	P	0.0001	0.06	-	-

analyzed by regression analysis, the results demonstrated that being single, divorced or separated, widowed, as well as self-management nursing intervention, and quality of life showed significant correlation with self-management behavior. The age, BMI and smoking history showed no significant correlation with self-management behavior (**Table 5**).

Multiple regression analysis

We further conducted multivariate regression analyses to evaluate the factors that affected the self-management behavior of patients with gastric cancer, and the results revealed that psychological function ($p = 0.003$) and self-management nursing intervention ($p < 0.0001$ were independent risk factors of poor self-management behavior (**Table 6**).

Discussion

This study suggests that the nursing intervention which is based on the IKAP model has obvious effect on patients with gastric cancer. The SUPPH score was significantly improved after nursing intervention in the experimental group compared to the control group. The quality of life was significantly improved in the experimental group as compared with the control group. Moreover, the regression analysis showed that being single, divorced or separated, widowed, as well as self-management nursing intervention, and QoL showed significant correlation with self-management behavior. The multiple regression analysis demonstrated that psychological function and self-management nursing intervention were the independent risk factors for poor self-management behavior.

IKAP-based nursing intervention exerts good application value in gastric cancer patients, which can provide seamless nursing service after the patient is discharged from the hospital, and ensure that the patient can still get scientific and standardized nursing guidance after discharge, as well as better communicate with the nursing provider by telephone, Wechat or door-to-door, and deal with the existing problems in real time [18-20]. The results of this study showed that the improvement of psychological state and quality of life in the observation group were significantly better than those in the control group. Research shows that continuous nursing after laryngeal cancer surgery is more helpful for physical recovery and cultivation of healthy living habits and behaviors [21, 22].

In recent years, the clinical nursing model has gradually changed from the traditional biological medical model to the modern bio-psychological medical model [23, 24]. Cancer research institutions in Europe and the United States have listed the quality of life as an important index to evaluate the effect of tumor treatment [25-27]. In the clinic, more and more attention is paid to the implementation of IKAP-based nursing intervention in patients with gastric cancer, so as to improve the quality of life and mood of patients to achieve good clinical effect

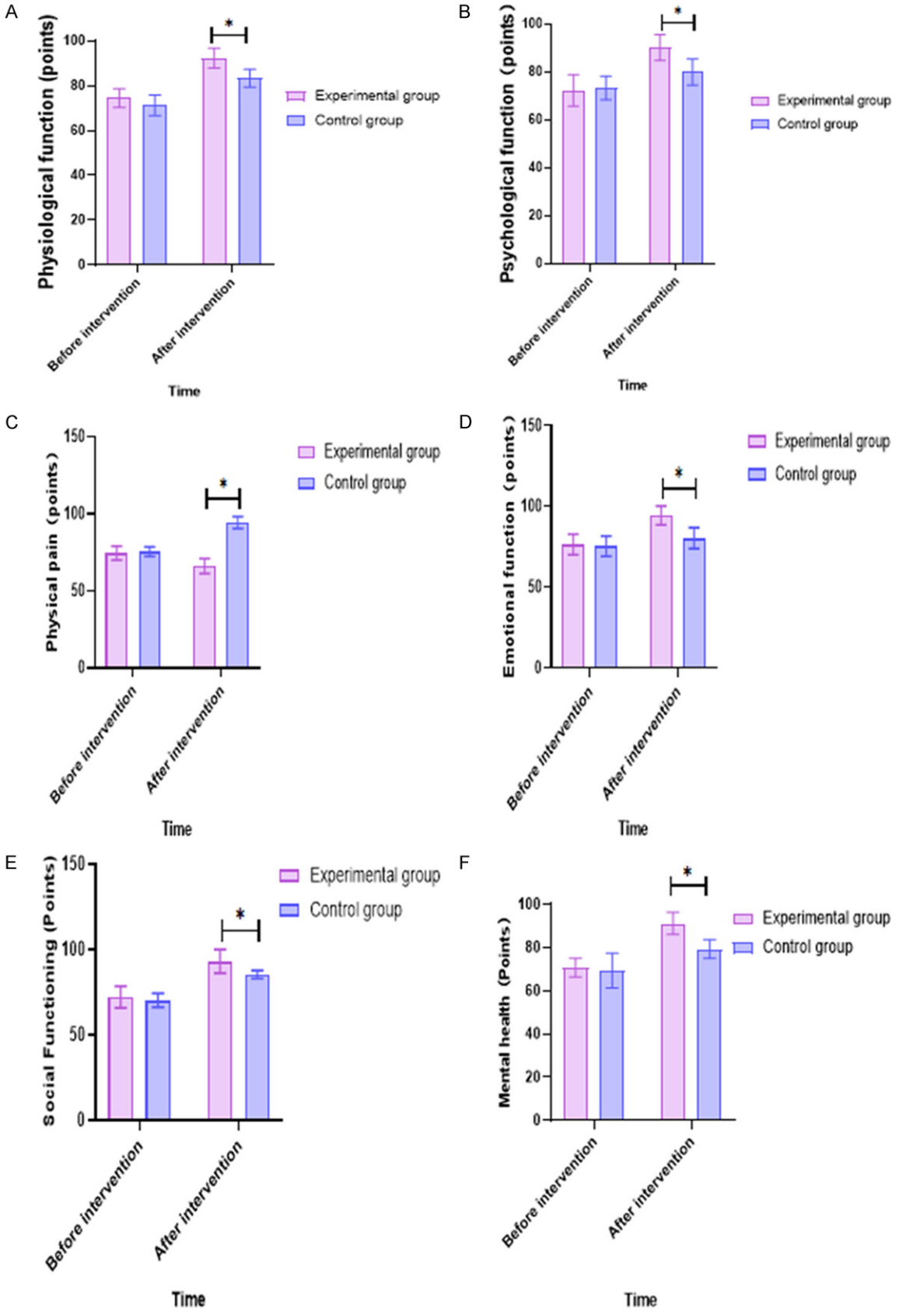

Figure 1. Comparison of quality of life between the two groups after intervention. A: Physiological function, B: Psychological function, C: Physical pain, D: Emotional function, E: Social function, F: Mental health.

Table 3. Comparison of cancer-related symptoms between the two groups (%)

Group	Number of cases	MaInutrition	Infection	Fatigue	Recurrent peptic ulcer	Weight loss
Experimental group	61	7 (11.4%)	5 (8.2%)	8 (13.1%)	7 (11.4%)	12 (19.7%)
Control group	63	10 (15.9%)	8 (12.7%)	23 (36.5%)	18 (28.6%)	15 (23.8%)
T	-	4.578	11.372	7.165	5.596	6.735
P	-	0.095	0.012	0.014	0.017	0.057

Note: Significant difference as P < 0.05.

Table 4. Comparison of cancer-related symptoms change between the two groups (%)

group	Number of cases	Improvement rate	Deterioration rate
Experimental group	61	49 (77.8%)	10 (16.4%)
Control group	63	26 (41.3%)	33 (52.4%)
T	-	10.896	8.889
P	-	0.005	0.009

Table 5. The relation of patients' psychology state and quality of life with independent variables

Indexes	rho	*P*
Age	-0.071	0.454
BMI (kg/m^2)	-0.070	0.461
Smoking	0.064	0.511
Married (Marital status)	-0.043	0.743
Single (Marital status)	0.557	< 0.001
Divorced or separated (Marital status)	0.428	< 0.001
Widowed (Marital status)	0.458	< 0.001
self-management nursing intervention	0.431	< 0.001
Physiological function	0.098	0.005
Psychological function	-0.072	0.001
Physical pain	0.439	< 0.001
Emotional function	0.864	< 0.001
Social function	0.764	< 0.001
Mental health	-0.329	< 0.001

Note: The person correlation analysis method is used for normal distribution data and Spearman correlation analysis method is used for non-normal distribution data.

[28-30]. The results showed that the scores of physical health, mental health and social function in the experimental group were higher than those in the control group, and the quality of life was significantly improved.

During hospitalization, the continuous nursing team understands the basic situation of patients by participating in ward rounds, formulating the continuous nursing plan after discharge, regularly checking the knowledge mastery and problems of patients, supervising patients to actively obtain knowledge, and telling patients when to review and what to review [31, 32]. This systematic, planned, targeted and convenient continuous nursing mode can more effectively improve the subjective enthusiasm of patients to participate in self-care than the traditional health education mode, enable patients to master the self-care skills, and allow patients to more actively participate in disease management, learn problem-solving skills, and finally achieve the purpose of improving the quality of life of the patients [33, 34].

It is undeniable that our research has some limitations. Firstly, this study was conducted in a single hospital with certain selection bias, and it is recommended to conduct multi-center research. Secondly, this study was a retrospective analysis, and thus, selection bias is inevitable. Finally, the sample size of this study was too small, which needs to be verified by further larger sample and more rigorous multi center research. In future studies, we will expand the sample size, extend the follow-up time, constantly improve the scheme and enrich the evaluation indicators (such as lung function) to evaluate the effect of the intervention.

In summary, the IKAP mode emphasizes the concept of being "patient-centered", and self-management intervention is carried out under the condition of fully mastering the basic information of patients, which fully mobilizes the positive performance of patients' self-management. It has been verified that the self-management intervention program for gastric cancer patients based on the IKAP model has a positive impact on patients, which can effectively improve patients' self-management ability and

Table 6. Multiple regression analysis

Dependent variables	Independent variables	B	SE	β	*P* value
Patients' self-management ability	Psychological function	0.323	0.043	0.533	0.003
	Self-management nursing intervention	1.488	0.594	0.384	< 0.0001

Note: B: nonstandard regression coefficient; SE: standard error; b: standardized regression coefficient; β: multiple correlation coefficient adjusted for the degrees of freedom.

self-efficacy, reduce the negative impact of the disease on patients, and improve the quality of life, which can provide reference for health education of clinical nurses.

Acknowledgements

The authors thank all patients who participated in this study.

Disclosure of conflict of interest

None.

Address correspondence to: Lixia Zhu, Department of Medical Oncology, The First Affiliated Hospital of Gannan Medical College, No. 26 Qingnian Road, Ganzhou 341000, Jiangxi, China. Tel: +86-0797-8685630; E-mail: zhulixia4547@163.com

References

[1] Gullo I, Grillo F, Mastracci L, Vanoli A, Carneiro F, Saragoni L, Limarzi F, Ferro J, Parente P and Fassan M. Precancerous lesions of the stomach, gastric cancer and hereditary gastric cancer syndromes. Pathologica 2020; 112: 166-185.

[2] Suzuki S, Takahashi A, Ishikawa T, Akazawa K, Katai H, Isobe Y, Miyashiro I, Ono H, Tanabe S, Fukagawa T, Muro K, Nunobe S, Kadowaki S, Suzuki H, Irino T, Usune S, Miyata H and Kakeji Y; Registration Committee of the Japanese Gastric Cancer Association. Surgically treated gastric cancer in Japan: 2011 annual report of the national clinical database gastric cancer registry. Gastric Cancer 2021; 24: 545-566.

[3] Dabo B, Pelucchi C, Rota M, Jain H, Bertuccio P, Bonzi R, Palli D, Ferraroni M, Zhang ZF, Sanchez-Anguiano A, Thi-Hai Pham Y, Thi-Du Tran C, Gia Pham A, Yu GP, Nguyen TC, Muscat J, Tsugane S, Hidaka A, Hamada GS, Zaridze D, Maximovitch D, Kogevinas M, Fernàndez de Larrea N, Boccia S, Pastorino R, Kurtz RC, Lagiou A, Lagiou P, Vioque J, Camargo MC, Paula Curado M, Lunet N, Boffetta P, Negri E, La Vecchia C and Luu HN. The association between diabetes and gastric cancer: results from the Stomach Cancer Pooling Project Consortium. Eur J Cancer Prev 2022; 31: 260-269.

[4] Yuan X, Xiao Y, Luo Y, Wei C, Wang J, Huang J, Liao W, Song S and Jiang Z. Identification and validation of PGLS as a metabolic target for early screening and prognostic monitoring of gastric cancer. J Clin Lab Anal 2022; 36: e24189.

[5] Takahashi Y, Yamamichi N, Kubota D, Shimamoto T, Nagao S, Sakuma N, Sakaguchi Y, Yakabi S, Tsuji Y, Wada R, Mitsushima T, Ichinose M and Fujishiro M. Risk factors for gastric cancer in Japan in the 2010s: a large, long-term observational study. Gastric Cancer 2022; 25: 481-489.

[6] Wani AH, Parry AH, Feroz I and Choh NA. Preoperative staging of gastric cancer using computed tomography and its correlation with histopathology with emphasis on multi-planar reformations and virtual gastroscopy. J Gastrointest Cancer 2021; 52: 606-615.

[7] Deng Y, Ding X, Song Q, Zhao G, Han L, Ding B, Wang X, Hao X and Li H. Alterations in mucosa-associated microbiota in the stomach of patients with gastric cancer. Cell Oncol (Dordr) 2021; 44: 701-714.

[8] Liu Y, Chen J, Pan Y, Cai Y, Ge C, Chu H, Xia C, Song Y, Chen Y, Wu B and Wang L. The effects of video based nursing education on perioperative anxiety and depression in patients with gastric cancer. Psychol Health Med 2021; 26: 867-876.

[9] Gao Q, Li H, Zou Y, Hou B and Liu L. Effectiveness of a comprehensive post-operative health education program in improving quality of life after gastric cancer surgery. Ann Palliat Med 2020; 9: 921-926.

[10] Chen X, Li L, Sharma A, Dhiman G and Vimal S. The application of convolutional neural network model in diagnosis and nursing of MR imaging in Alzheimer's disease. Interdiscip Sci 2022; 14: 34-44.

[11] Fan L, Lei F, Zhu Z, Hu C, Ye L and Wang N. Nursing intervention using a whole-process escort playing a relative role combined with mind mapping in patients undergoing breast cancer surgery: a randomized trial. Ann Palliat Med 2021; 10: 12047-12054.

[12] Waluya JG, Rahayuwati L and Lukman M. Supportive-educative nursing intervention on knowledge, attitude and physical activity intensity of survivors of breast cancer. Work 2022; 71: 1137-1144.
[13] Moreira RP, Guerra FVG, Ferreira GO, Cavalcante TF, Felício JF, Ferreira LCC and Guedes NG. Effects of the nursing intervention Fall prevention in older adults with arterial hypertension using NANDA-I, NIC, and NOC. Int J Nurs Knowl 2022; 33: 147-161.
[14] Lv S, Yu S, Chi R and Wang D. Effects of nutritional nursing intervention based on glycemic load for patient with gestational diabetes mellitus. Ginekol Pol 2019; 90: 46-49.
[15] Kim HD, Lee JS, Yook JH, Ryu MH, Park YK, Kim JY, Kim YW, Oh SC, Kim JG, Cheong JH, Jeong O, Noh SH and Kang YK. Radiological criteria for selecting candidates for neoadjuvant chemotherapy for gastric cancer: an exploratory analysis from the PRODIGY study. Gastric Cancer 2022; 25: 170-179.
[16] Saragiotto BT, Fioratti I, Tiedemann A, Hancock MJ, Yamato TP, Wang SSY, Chau JY and Lin CC. The effectiveness of strategies to promote walking in people with musculoskeletal disorders: a systematic review with meta-analysis. J Orthop Sports Phys Ther 2020; 50: 597-606.
[17] Gadisa DA, Gebremariam ET and Ali GY. Reliability and validity of Amharic version of EORTC QLQ-C30 and QLQ-BR23 modules for assessing health-related quality of life among breast cancer patients in Ethiopia. Health Qual Life Outcomes 2019; 17: 182.
[18] Qian Z and Wang J. Application of computed tomography imaging in diagnosis of endocrine nerve of gastric cancer and nursing intervention effect. World Neurosurg 2021; 149: 341-351.
[19] Liu L, Bai Y, Gu H, Zhu H, Yu Y, Lu P, Wang Y, Zhang H and Li M. The prognostic efficacy of the 8th edition UICC TNM classifications for gastric cancer in Chinese patients: a study based on follow-up system of nursing department. Medicine (Baltimore) 2018; 97: e12284.
[20] Wang M, Wang S, Su Q and Ma T. Effect of combining early chemotherapy with Zhipu Liujunzi decoction under the concept of strengthening and consolidating body resistance for gastric cancer patients and nursing strategy. Contrast Media Mol Imaging 2021; 2021: 2135924.
[21] Ren D, Feng M, Zhang S, Zhang Y and Li J. Effect of apatinib combined with Seggio on the expression of serum AFP and CA724 and long-term survival rate in patients with advanced gastric cancer undergoing comfortable nursing intervention. J Healthc Eng 2022; 2022: 2004973.
[22] He XL and Cao ZM. Effect of high-quality nursing intervention on the psychological disorder in patients with gastric cancer during perioperative period: a protocol of systematic review and meta-analysis. Medicine (Baltimore) 2020; 99: e20381.
[23] Liu XY, Chen J and Li J. Two metal-coordination polymers: photocatalytic hydrogen production and clinical nursing value on gastric cancer combined with hyperthermic intraperitoneal chemotherapy by inducing induce oxidative stress response. Spectrochim Acta A Mol Biomol Spectrosc 2020; 243: 118762.
[24] Song W, Teng W, Shi X, Liu X, Cui Z and Tian Z. The relationship between RUNX3 expression, nursing strategies and nutritional status in elderly patients with advanced gastric cancer. Iran J Public Health 2017; 46: 762-770.
[25] Xu X, Tang X, Wu X and Feng X. Biosynthesis of sorafenib coated graphene nanosheets for the treatment of gastric cancer in patients in nursing care. J Photochem Photobiol B 2019; 191: 1-5.
[26] Li HQ, Xue H, Yuan H, Wan GY and Zhang XY. Preferences of first-degree relatives of gastric cancer patients for gastric cancer screening: a discrete choice experiment. BMC Cancer 2021; 21: 959.
[27] Hu J, Wang LL and Li Y. Effects of high-quality nursing intervention on negative emotions, postoperative complications and gastrointestinal function in patients with gastric cancer surgery. Am J Transl Res 2022; 14: 1652-1662.
[28] Zhang Y, Wang X and Yang H. Effect of traditional Chinese medicine nursing on postoperative patients with gastric cancer and its impact on quality of life. Am J Transl Res 2021; 13: 5589-5595.
[29] Wang Y and Zhou Q. The effect of accelerated rehabilitation nursing on postoperative recovery, nutritional status, and psychological status in patients with gastric cancer. Am J Transl Res 2021; 13: 3666-3673.
[30] He F and He RX. Systematic nursing interventions in gastric cancer: a randomized controlled study. World J Clin Cases 2022; 10: 1843-1851.
[31] Wen Y, Ma J, Jiang X, Gao G, Xie H and Lu P. Influencing factors of holistic nursing intervention under a social medical model on the psychology and quality of life of patients with advanced gastric cancer. Am J Transl Res 2021; 13: 3369-3379.
[32] Rui A, Xu Q and Yang X. Effect of multidisciplinary cooperative continuous nursing on the depression, anxiety and quality of life in gastric cancer patients. Am J Transl Res 2021; 13: 3316-3322.

[33] Lagergren J, Andersson G, Talbäck M, Drefahl S, Bihagen E, Härkönen J, Feychting M and Ljung R. Marital status, education, and income in relation to the risk of esophageal and gastric cancer by histological type and site. Cancer 2016; 122: 207-12.

[34] Gao Q, Li H, Zou Y, Hou B and Liu L. Effectiveness of a comprehensive post-operative health education program in improving quality of life after gastric cancer surgery. Ann Palliat Med 2020; 9: 921-926.