

Efficacy of an Interactive Web-based Self-management Support Intervention on Health Outcomes in Patients with Colorectal Cancer

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Background

Colorectal cancer is a common cancer diagnosis worldwide. With appropriate treatment, most patients survive long-term. However, patients often suffer long-term consequences from the side effects of the disease and its treatments. In addition, an unhealthy lifestyle will further affect the patient's prognosis and quality of life. Self-management support interventions can help patients achieve a healthy lifestyle and better adjustment. However, they are costly and may not be assessable in specific populations. There is a need to develop cost-effective interventions for these patients.

Aims

This study aimed to test the effectiveness of an interactive web-based self-management support intervention on primary outcomes, quality of life and secondary outcomes, self-efficacy, supportive care needs, physical activity, symptom distress, and emotional distress of patients with colorectal cancer.

Methods

A randomized control trial was used to test the intervention effect. A convenience sample of postoperative colorectal cancer patients (stages I–III) were recruited and randomly assigned to a control or interventional group. The intervention group received the colorectal cancer interactive web-based self-management support intervention which provided patients with information, social and psychological support, and personalized and flexible implementation mechanisms to improve patients' symptom management strategies and promote self-care behaviors and treatment adherence. The patients in the control group only received routine health education and health education leaflets provided by each hospital after discharge, including disease introduction and treatment, symptom management, diet and tracking, etc. Data for both groups were collected using study questionnaires at baseline (T1), month 2 (T2), month 4 (T3), and month 6 (T4). Descriptive analyses were used to describe patient demographics, disease, and outcome variables. Chi-square, t-test, and GEE were used to examine the effects of the study interventions.

Results

Sixty-four colorectal cancer patients participated in the study, with 33 in the intervention group and 31 in the control group. Results from generalized estimating equations showed that group-by-time interactions were significant for self-efficacy, supportive care needs, and physical activity levels but not for symptom distress, depression, and quality of life.

Conclusion

The results of this study partially support the research hypothesis that the research intervention can effectively improve self-efficacy, reduce support care needs, and increase physical activity but cannot improve symptom distress, depression, and quality of life.

Table 1. Between-group comparison of participants' demographics and disease characteristic at baseline (N=65)

Variables	Total (n=64)	Control (n=31)	Intervention (n=33)	χ^2	p
	f (%)	f (%)	f (%)		
Sex				2.34	0.141
Male	29(45.3)	11(35.5)	18(54.5)		
Female	35(54.7)	20(64.5)	15(45.5)		
Education				1.09	0.779
Primary or below	7(10.9)	4(12.9)	3(9.1)		
Middle school	8(12.5)	3(9.7)	5(15.2)		
High school	20(31.3)	11(35.5)	9(27.3)		
College or above	29(45.3)	13(41.9)	16(48.5)		
Marital status				0.61	0.739
Single	6(9.4)	2(6.5)	4(12.1)		
Married	46(71.9)	23(74.2)	23(69.7)		
Others	12(18.8)	6(19.4)	6(18.2)		
Employment status				0.62	0.461
Unemployed	36(56.3)	19(61.3)	17(51.5)		
Employed	28(43.8)	12(38.7)	16(48.5)		
Hospital				0.29	0.867
A	35(54.7)	16(51.6)	19(57.6)		
B	18(28.1)	9(29.0)	9(27.3)		
C	11(17.2)	6(19.4)	5(15.2)		
Cancer stage				3.69	0.158
I & IIA	39(60.9)	19(61.3)	20(60.6)		
IIB & IIC	3(4.7)	3(9.7)	0(0.0)		
III	22(34.4)	9(29.0)	13(39.4)		
Surgical approach				0.50	0.600
Laparoscopy	42(65.6)	19(61.3)	23(69.7)		
Laparotomy	22(34.4)	12(38.7)	10(30.3)		
Adjuvant therapy				0.96	0.811
No	24(37.5)	11(37.9)	13(39.4)		
Oral chemotherapy	14(21.9)	8(27.6)	6(18.2)		
Chemotherapy	21(32.8)	9(31.0)	12(36.4)		
CCRT	3(4.7)	1(3.4)	2(6.1)		
	Mean ± SD	Mean ± SD	Mean ± SD	t	p
Age	60.73±9.76	63.71±9.78	57.94±9.02	-2.46	0.017
BMI	23.88±4.09	24.17±4.66	23.60±3.51	-0.55	0.582
CCI	0.44±0.69	0.52±0.72	0.36±0.65	-0.89	0.379

CCRT, concurrent chemoradiation therapy

Grant number

MOST - 2314 - B - 227 - 004 - MY3

Table 2. Between-group comparisons in outcome variables' changes over time using generalized estimating equations (n = 64)

Variables	Time	Intervention (n=31)	Control (n=33)	Comparing the between-group difference in changes over time					
				Mean ± SD	Mean ± SD	Parameters	β	SE	95% CI
Self-efficacy	T4	86.91±17.93	75.25±21.17	I (T4-T1) VS. C (T4-T1)	18.60	6.66	5.54~31.66	7.79	0.005
	T3	87.65±18.05	75.87±24.10	I (T3-T1) VS. C (T3-T1)	18.72	6.32	6.32~31.11	8.76	0.003
	T2	86.59±18.67	77.55±23.74	I (T2-T1) VS. C (T2-T1)	15.97	5.50	5.19~26.76	8.42	0.004
	T1	83.367±23.82	90.61±19.10	-	-	-	-	-	-
Supportive care needs	T4	43.95±9.60	60.94±27.95	I (T4-T1) VS. C (T4-T1)	-	7.96	-34.97~-3.76	5.91	0.015
	T3	51.19±19.96	68.75±29.27	I (T3-T1) VS. C (T3-T1)	-	8.26	-36.13~-3.77	5.84	0.016
	T2	54.66±24.37	63.29±23.09	I (T2-T1) VS. C (T2-T1)	-	5.82	-	3.58	0.059
	T1	63.73±25.15	61.35±15.77	-	-	-	-	-	-
Symptom distress	T4	0.65±0.65	1.75±1.64	I (T4-T1) VS. C (T4-T1)	-1.29	0.48	-2.22~-0.35	7.19	0.007
	T3	0.76±0.72	2.12±1.82	I (T3-T1) VS. C (T3-T1)	-1.55	0.50	-2.53~-0.56	9.43	0.002
	T2	1.16±1.15	2.44±1.87	I (T2-T1) VS. C (T2-T1)	-1.46	0.46	-2.36~-0.55	9.97	0.002
	T1	2.11±1.92	1.93±1.44	-	-	-	-	-	-
Emotional distress	T4	7.52±6.73	16.22±10.32	I (T4-T1) VS. C (T4-T1)	-7.10	3.23	-13.43~-0.76	4.82	0.028
	T3	8.65±8.22	16.50±12.62	I (T3-T1) VS. C (T3-T1)	-6.25	2.84	-11.82~-0.68	4.83	0.028
	T2	10.66±10.22	16.88±11.64	I (T2-T1) VS. C (T2-T1)	-4.62	2.33	-9.19~-0.05	3.93	0.048
	T1	11.82±9.83	13.42±9.87	-	-	-	-	-	-
Physical activity	T4	1265.71±1056.14	594.92±344.18	I (T4-T1) VS. C (T4-T1)	858.58	272.79	323.91~1393.24	9.91	0.002
	T3	1200.52±1006.66	715.98±384.79	I (T3-T1) VS. C (T3-T1)	672.33	262.04	158.73~1185.92	6.58	0.010
	T2	766.64±590.24	779.31±593.80	I (T2-T1) VS. C (T2-T1)	175.10	158.58	-	1.22	0.269
	T1	528.44±359.04	716.22±836.36	-	-	-	-	-	-
Quality of life	T4	109.33±16.68	97.56±18.78	I (T4-T1) VS. C (T4-T1)	10.57	6.31	-	3.13	0.077
	T3	109.78±17.69	97.70±18.62	I (T3-T1) VS. C (T3-T1)	10.87	4.95	1.17~20.57	4.62	0.032
	T2	105.45±18.64	99.33±21.44	I (T2-T1) VS. C (T2-T1)	4.90	4.73	-	0.32	0.569
	T1	100.73±18.07	99.52±19.31	-	-	-	-	-	-

Note. * $p < 0.01$, ** $p < 0.001$