

Development and Evaluation of the Effectiveness of the Web-Based Education Program Among Cancer Patients Undergoing Treatment of Systemic Chemotherapy: A Randomised Controlled Trial

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Research Article

Keywords: Cancer, Symptom Management, Quality of Life, Web-Based Education, Tele-nursing, Supportive care needs

Posted Date: December 8th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-1023908/v1>

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Version of Record: A version of this preprint was published at Supportive Care in Cancer on April 12th, 2022. See the published version at <https://doi.org/10.1007/s00520-022-07039-w>.

Abstract

Purpose

This study aims to develop a web-based education program among cancer patients undergoing treatment of systemic chemotherapy and to evaluate the effect of the program on symptom control, quality of life, self-efficacy, and depression.

Methods

A web-based education program was prepared in line with patient needs, evidence-based guidelines, and expert opinions and tested with 10 cancer patients. A single-blind, randomised controlled study design was applied at a medical oncology unit of a university hospital. Pretests were applied to 60 cancer patients undergoing systemic chemotherapy, and the patients (intervention:30, control: 30) were randomized. The intervention group used the web-based education program for three months, and they were allowed to communicate with researchers 24/7 via the website. The effectiveness of the web-based education program at baseline and after 12 weeks was evaluated. The CONSORT 2010 guideline was performed.

Results

Expert opinions were found to be compatible with each other (Kendall's $W_a = 0.233$, $p=0.008$). The difference between symptom control ($p=0.026$) and quality of life ($p=0.001$) during the three-month follow-up of the groups were statistically significant, and there was no difference between the groups in terms of self-efficacy and depression levels ($p = 0.05$).

Conclusion

The web-based education program was found to be effective in remote symptom management and improving the quality of life of cancer patients.

Trial registration

www.clinicaltrials.gov , NCT05076916 (12 October 2021, retrospectively registered)

Introduction

Cancer is a life-threatening disease with negative physical, psychological, and socioeconomic effects [1, 2]. Patients with cancer receive outpatient chemotherapy and must manage the most important symptoms of chemotherapy at home without the support of a healthcare professional. Patients with cancer and their families need to be supported not only in the hospital but also in the home environment [3]. Patients want to receive information about strategies for coping with symptoms or problems that they frequently encounter after treatment [4]. Since they do not feel well enough to participate in self-management education in clinics during treatment, they need to be useful and accessible support [5].

Recently, health reforms and policies have emphasized that patients should be supported to take an active role in the management of their disease. It is stated that interactive health communication practices, which provide patients with education, equipment, and strength to better manage their diseases, play an important role in improving patient care [6]. Today, most adults have access to the Internet, and patients use it as a primary source with no time and place restrictions [7–9]. Considering the increase in the number of patients with cancer, it is stated that a web-based education program can be used as a cost-effective tool to support them [10]. It is possible to reach a wide audience with web-based education programs, and the rate of individuals using web-based information has increased with the development of effective online education programs [9, 11]. With health education on the web, interactive, economical, efficient, and appropriate content can be provided to all users, such as patients, their families, and health professionals. Additionally, web applications can be used effectively in providing communication between patients and health professionals in chronic health problems, symptom management, accessing health information, providing social interaction, and supporting recovery through motivational games [9, 12–14]. It has also been reported that effective online communication can reduce patient anxiety and improve clinical patient outcomes [15].

Some studies in the literature have proved the effect of web-based education practices on chronic diseases, such as diabetes, hypertension, stroke, respiratory diseases, cancer, and high-risk health problems, such as obesity, anxiety, and depression [5, 16–25]. The results of the studies in the literature have shown that web-supported follow-ups improve disease management and reduce symptom burden [6, 26, 27], and that there are improvements in the pain and depression symptoms of patients who have received multiple education programs via tele-monitoring [28]. Mobile health applications can play an important role in the management of cancer treatment and symptoms, supporting drug adherence, providing cancer-related information, planning, monitoring, and cancer screening and diagnosis [13]. Additionally, today's pandemic conditions have increased the need for web-based education for patients with cancer.

It has been reported that the rate of use and effectiveness of web-based programs planned by determining the needs of patients with cancer will be higher [29]. Web-based education program in line with patient needs and telephone follow-up may be an important strategy to improve symptom control and quality of life such as in the current COVID-19 (coronavirus) pandemic. Thus, social isolation and contact with patients will decrease, hospital-associated infections and problems related to coming to the hospital will be reduced. In the home environment, the patient with cancer will feel more secure, comfortable and empowered. This study was conducted to determine the needs of patients with cancer for a web-based education program and to design a program to meet

the needs. Evaluating the effect of the web-based education program among cancer patients will be useful in planning appropriate remote nursing interventions to increase the symptom control and quality of life of patients. The primary aim of the study is to develop a web-based education program for patients with cancer receiving systemic treatment and to test the validity of this program. The secondary aim is to evaluate the effect of this web-based education program on symptom control, quality of life, self-efficacy, and depression in patients with cancer undergoing systemic chemotherapy.

Methods

Design and participants

In the first stage of the study, the needs of patients for web-based education were determined using a descriptive design, and in the second stage, the effectiveness of the web-based education program was evaluated using a randomized controlled trial design, with the participants being single-blinded. A randomized controlled trial based on the Consolidated Standard of Reporting Trials - CONSORT 2010 - guidelines was performed. In the first stage of the study, 30 patients with cancer were interviewed to determine their expectations regarding their needs for web-based education. In the second stage of the study, the sample size was calculated on the G*POWER software package based on an 85% power and a 95% confidence interval. The study was conducted with patients with cancer (n=60), including 30 in the intervention and 30 in the control groups. The study consisted of patients who were over the age of 18, received at least two cycles of systemic chemotherapy, had no verbal communication disorder, were literate, had Internet access and use the Internet. Those with a diagnosis of psychiatric disorder were excluded from the study. Data of both stages of the study were collected at a medical oncology unit of a university hospital between May 7, 2014, and February 17, 2016.

Preparation of the website

The researchers developed a "Web-Based Education Needs Assessment Form for Patients with Cancer" based on a review of the literature [1,3,16,26-28,30]. The expectations and suggestions of the 30 patients with cancer, who were treated with systemic chemotherapy, regarding the need for web-based education, were evaluated with this form. A group of 10 experts evaluated the content of the program, including three oncology physicians, four nursing faculty members, and three nurses. Expert opinions were found to be consistent (Kendall's $W_a = 0.233$, $p=0.008$). After obtaining expert opinions, a pilot study was conducted with 10 different patients with cancer who met the sampling criteria. The intelligibility and usability of the program were tested in the pilot study. Patients with cancer included in the first stage of the study were excluded from the second stage.

Procedures

The effect of the web-based education program on patient outcomes was analyzed by dividing the participants into groups through randomization. All patients with cancer who met the sampling criteria were assigned to the intervention and control groups through block randomization (1:1). The researchers used a randomization list created on a computer application (<https://www.randomizer.org/>). Pretest data of the study were collected from patients who consented to participate in the study by two independent researchers who were not involved in the implementation of the study. For assigning each patient to a group, the other team members were called by the same independent researcher, and the subjects were assigned to the groups according to the randomization list created. Two independent researchers conducted the assignment of the participants on the intervention and control groups and the evaluation of the outcome measurement data. Since the researchers conducted the interventions, they were not be blinded. However, the participants were blinded because they did not know the hypotheses of the study and which group they were in.

The web-based education program was introduced to the patients with cancer in the intervention group during face-to-face interviews. They were asked to examine the program for at least two hours a week for three months. During the follow-up period, the patients in the intervention group were called twice a week and reminded to use the education program. The researchers get in contact with the patients online via the website. During the follow-up period, the patients contact the research team by calling or writing messages via the website 24/7. An e-mail account was created by the research team using the email system of the university, and it was shared with the patients. The clinical researchers of the team answered the patients' questions via this e-mail account. Within the scope of the study, a new cell phone number was purchased, and the researchers used on a rotating basis to answer patients' questions as a phone response system. During the follow-up, patients' questions were answered on the phone. The control group received routine patient education and routine hospital follow-ups given by Oncology Education Nurses during the three-month follow-up period. In the third month, after the follow-up stage of the study was completed, the post-tests were administered to the patients in the intervention and control groups who came to the hospital for follow-up or treatment. A flowchart of the study is given in Fig.1.

Measures

Questions about the descriptive and disease characteristics of the patients included age, gender, marital status, education level, cancer type, stage, metastatic status, and treatment type. The outcome measures of the study were determined as the symptoms, quality of life, self-efficacy, and depression levels at baseline and three-months.

- i. Rotterdam Symptom Checklist is used to evaluate the problems of patients with cancer developing due to the symptoms they experience. The items on the scale are scored between 1 and 4 by using a Likert-type scoring system. The scale consists of 39 items and has 4 sub-dimensions: Physical Symptom Discomfort, Psychological Discomfort, Activity Level, and Quality of Life. The higher the scores obtained from the scale, the greater the distress. Cronbach's alpha value of the scale was determined as 0.88 [31].
- ii. EORTC-QLQ-C30 Quality of Life Scale was developed to measure the quality of life of patients with cancer. It includes 30 questions and three sub-dimensions: General Well-Being, Functional Difficulties, and Symptom Control. The maximum score on the scale is 100, and the minimum is 0. High

scores on the functional sub-dimension indicate good/healthy functional status, high scores on the symptom sub-dimension indicate high levels of symptoms and/or problems, and high scores on the global health status/quality of life sub-dimension indicate good quality of life [32].

- iii. Strategies Used by Patients to Promote Health is used to assess the self-confidence of individuals in fulfilling the strategies they use to improve health. It consists of 29 items under 3 sub-dimensions, namely, coping with stress, decision making, and positive behavior development. The scores that can be obtained from the scale range from 29 to 145, and increased scores indicate an increased level of self-efficacy. Cronbach's alpha value of the scale was found as 0.92 [33].
- iv. Beck Depression Scale is a self-assessment scale that measures the symptoms of depression observed in physical, emotional, cognitive, and motivational areas. The purpose of the scale is not to diagnose depression, but to objectively measure the severity of depressive symptoms. Each of the 21 items on the scale includes four statements numbered 0, 1, 2, and 3. Two of the items on the scale are reserved for emotions, eleven items for cognitions, two items for behavior, five items for somatic symptoms, and one item for interpersonal symptoms. The total score that can be obtained from the scale varies between 0 and 63, and the scores are interpreted as follows: 0–9, no depression; 10–15, mild depression, 16–23 moderate depression, and 24–63 severe depression [34].

Statistical analysis

Statistical Package for Social Sciences 23.0 software was used in the analysis of the data obtained from the study. Percentages, arithmetic means, t-test, and one-way ANOVA tests were used in the analysis of the data obtained from the sample in the first stage of the study, and percentages, arithmetic means, t-test, one-way ANOVA, analysis of variance in repeated measures, chi-square tests, and Intention-to-treat (ITT) analysis was used to evaluate the data obtained from the sample in the second stage of the study. The level of significance was set as 0.05 in the entire study.

Ethics of the study

This study was performed in line with the principles of the Declaration of Helsinki. Approval was granted by the Ethics Committee of University B (22.08.2013/23-5). The objective of the study was explained to the participants. Participants were assured of their right of refusal to take part in or to withdraw from the study at any stage with no negative consequences. The validity and reliability studies of all scales used in the study were conducted, and permission of the authors of the scales was obtained via e-mail.

Results

The mean age of the patients in the intervention group was 52.47 ± 10.57 years, and it was 55.57 ± 10.14 years in the control group. Of the patients in the intervention group, 56.7% were male, and 90% was married. In the control group, 56.7% of the patients were female, and 80% was married. Also, 36.7% of the patients in the intervention and control groups was diagnosed with gastrointestinal system cancer. The comparison of the descriptive and disease characteristics of the patients with cancer in the intervention and control groups in the study indicated that they had statistically similar characteristics ($p > 0.05$) (Table 1).

The difference between the intervention and control groups in terms of the mean scores obtained from the overall Rotterdam Symptom Checklist ($F = 5.252$, $p = 0.026$) and its sub-dimensions, namely, Physical Symptom Discomfort ($F = 8.838$, $p = 0.004$), Psychological Discomfort ($F = 6.981$, $p = 0.011$), and Activity Level ($F = 6.218$, $p = 0.016$), was found to be significant, and the variance during the follow-up period from the beginning to the end of the study was statistically significant (Table 2).

A significant difference was found between the intervention and control groups in terms of the Cognitive Function sub-dimension ($F = 6.917$, $p = 0.011$). According to the same scale, the variance during the follow-up period from the beginning to the end of the study was found to be statistically significant in terms of scores obtained from the Functional Health ($F = 6.753$, $p = 0.012$), Symptom ($F = 13.375$, $p = 0.001$), Emotional Function sub-dimensions ($F = 7.701$, $p = 0.008$), and the total scale ($F = 11.875$, $p = 0.001$) (Table 3).

According to the mean scores of the patients from the Scale of Health Promotion Strategies Used by Patients, it was determined that the difference between the intervention and control groups was not significant by time, groups, or by time and groups ($p > 0.05$) (Table 4). According to the mean scores of the Beck Depression Scale, there was no statistically significant difference between the intervention and control groups by time ($F = 2.236$, $p = 0.141$), groups ($F = 1.294$, $p = 0.261$), or both variables ($F = 0.116$, $p = 0.735$) ($p > 0.05$) (Table 5).

Discussions

Recently, the number of web-based education programs and applications in the field of health has increased in parallel with the developments in technology. In the first stage of our study, a needs analysis was conducted for patients who received systemic chemotherapy for a web-based education program design. The results of the study indicated that the vast majority of the patients used the Internet to get health information. In a study, it was found that the most common source of information used by patients other than healthcare professionals was the Internet [35]. These findings reveal the importance of web-based education programs and the necessity of developing and disseminating websites that contain evidence-based information.

The Internet is an important source that many people around the world use to get health information. Internet users prefer the Internet for obtaining information about diseases, treatments, seeking new or alternative treatment options, or searching for support groups [13, 30, 36]. It was determined that surviving patients with oral cancer wanted to get information especially about symptom management and were willing to use a web-based education program to increase their quality of life [17]. Tele-health applications are a promising method for the future of self-management [5]. The need for seeking information and symptom management online has increased, especially due to pandemic-related fear, anxiety, and social isolation worldwide.

The difference between the intervention and control groups was found to be significant according to symptom levels. Initial symptom intensities of the patients in both the intervention and control groups were found to be higher. The patients were included in the study after the second cycle of chemotherapy treatment, during the period when the symptoms were most intense. The problems related to the symptoms experienced by the intervention and control group patients decreased over time. This may have been due to factors, such as the decrease in the side effects of chemotherapy over time, the improvement in patients' coping skills, and the usefulness of the web-based education program in the intervention group. In the study, the symptom distress of the control group patients was found to be higher than that of the intervention group patients. According to these results, the web-based education program had positive effects on the symptom intensities of the patients in the intervention group.

It was found that oral mucositis, diarrhea, constipation, nausea, pain, fatigue, insomnia symptoms, unplanned hospital presentations, and hospitalizations of patients with cancer who received oral chemotherapy and whose symptoms were examined once a week according to the home care nursing model decreased significantly compared to patients with cancer who received standard care [37]. However, home follow-up practices cannot be conducted effectively due to an inadequate number of healthcare professionals and high patient population and costs. For this reason, it is important to disseminate easily accessible and economical web-based education programs. It was determined that a 12-week individualized education program with online support was effective in preventing cancer-induced fatigue, reducing anxiety, and increasing health-related quality of life [38]. It has been shown that follow-ups conducted with web support reduce the symptom burden [6, 26, 27], and pain and depression symptoms of patients [28].

In a study examining the effects of standard education and tele-monitoring on patient outcomes, it was stated that standard education was effective in symptoms such as pain, anxiety, and depression only in the first week and that education and tele-monitoring provided more and long-term improvement in patient outcomes [39]. In patients with advanced non-small-cell lung cancer treated with chemotherapy, three months of web-based health education provided a significant reduction in the first 10 important symptoms according to the Symptom Distress Scale [21]. The web-based education program and the availability of health professionals at any time are precious in symptom management and alleviating the symptom burden.

It was determined that there was a significant difference between the intervention and control groups in terms of quality of life. In the web-based study of Ruland et al. [6], the self-efficacy and health-related quality of life scores of patients in the control group decreased over time. Web-based education was found to affect on increasing the quality of life in patients with breast cancer [20], and a web-based health education implemented for three months had a significant effect on global quality of life and emotional functions in patients with lung cancer receiving chemotherapy treatment [21].

Our study results indicated that while the functional health status of the intervention and control group patients was better at the beginning, this situation deteriorated over time. The time-dependent difference between them was statistically significant. This result has been due to factors such as the progression of the disease over time and burnout observed in the patient and their relatives. It was found that the patients in the control group had more symptoms. Additionally, it was observed that the global health status and quality of life of the intervention group patients were better than those of the control group. The web-based education program has contributed to this outcome.

It was found that there was no difference between the intervention and control groups according to the self-efficacy status. Some studies have shown that the self-efficacy levels of patients with breast cancer do not change before and after chemotherapy treatment [40], and 30–60% of them have high levels of distress for six months after the completion of their treatment [41]. Different factors, such as chronic characteristics of cancer, disease, and treatment-related symptom burden and psychological problems, and low socioeconomic status have affected the level of self-efficacy. It is recommended to develop and expand programs that can be implemented face-to-face or online to increase the level of self-efficacy in patients with cancer.

There was no difference between the intervention and control groups according to the depression status. While there was a mild level of depression in the intervention and control group patients at the beginning, the symptoms of depression decreased during the follow-up period. Although there was no difference in the level of depression between the intervention and control groups in the study findings, the decrease in depression levels in the intervention group, which included advanced-stage patients with high metastasis, despite the fact that the treatment and symptom burden, can be considered a significant clinical finding. It was determined that there was no significant difference between emotional functions, social functions, and depression, and fatigue levels in the initial, 6th-month, and 12th-month measurements of the effect of web-based interventions in patients with cancer [42]. It was found that the web-based cognitive rehabilitation intervention in patients with cancer did not yield a significant effect on distress, quality of life, and perception of illness during the three-month follow-up period [24]. The web-based education program has positive effects on depression and that these findings be promising.

Limitations

The participants of this study were patients with cancer who were literate, were treated with systemic chemotherapy, and had Internet access, the results cannot be generalized to all patients with cancer treated with chemotherapy. Additionally, the web-based education program applied for 12 weeks was not enough to describe the long-term effects of the study. Future studies include patients with cancer undergoing different treatment modalities, and the longer-term impact of web-based education be assessed.

Conclusion

Along with the developing technology, web-based education programs are easily accessible and they involve low-cost tools that can support patients with cancer in symptom management, improving the quality of life, and coping with the disease. Considering the factors, such as the pandemic in the world today, the increase in the number of patients diagnosed with cancer and receiving treatment every day, and hospital-associated infections, it is necessary to increase the number of web-based applications for effective web-based symptom management, strengthening self-care and improving the quality of life of patients with cancer. The patient should be supported through remote symptom management as a health system in their cancer journey. It is recommended to increase

studies on the evaluation of the effects of web-based education programs and to create health policies in which these practices can be implemented in health institutions.

Declarations

Consent to participate Informed consent was obtained from all individual participants included in the study.

Consent for publication All authors have reviewed the manuscript and agree to its publication.

Funding information

This study was funded by the *Scientific and Technological Research Council of Turkey* (TUBITAK) (Project Number: 113S924).

Competing interests The authors have no competing interests to declare that are relevant to the content of this article

Ethical approval Ethical approval has been obtained.

Data availability Anonymized data is securely stored with the lead author.

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by [HB], [HSC], [FA], [KO], [AT], [YK], [MGS], [EY] and [SK]. The first draft of the manuscript was written by [HB] and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

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Tables

Table 1. Descriptive and disease characteristics of the patients in the intervention and control groups included in the study (Pretest)

Descriptive and disease characteristics	Intervention		Control		Test	
	n	%	n	%	t	p
Age (X±SD)	52.47 ±10.57		55.57 ±10.14		2.354	0.072
Gender						
Female	13	43.3	17	56.7	1.067	0.302
Male	17	56.7	13	43.3		
Marital status						
Single	3	10.0	6	20.0	1.176	0.278
Married	27	90.0	24	80.0		
Education level						
Primary school	9	30.0	11	36.7	0.840	0.657
High school	9	30.0	6	20.0		
Undergraduate and above	12	40.0	13	43.3		
Type of cancer						
Breast	6	20.0	9	30.0	3.800	0.803
Lung	3	10.0	2	6.7		
Gastro-intestinal	11	36.7	11	36.7		
Gynecological	3	10.0	2	6.7		
Tumor in tongue	4	13.4	1	3.3		
Bladder	1	3.3	3	10.0		
Prostate	1	3.3	1	3.3		
Other	1	3.3	1	3.3		
Stage						
Stage I	3	10.0	6	20.0	5.609	0.132
Stage II	5	16.6	11	36.7		
Stage III	11	36.7	6	20.0		
Stage IV	11	36.7	7	23.3		
Metastasis status						
No	11	37.9	18	62.1	3.270	0.071
Yes	19	62.1	12	37.9		
Type of treatment						
CT	8	26.7	12	40.0	2.467	0.481
CT+RT	4	13.3	3	10.0		
CT+Surgical	5	16.7	7	23.3		
CT + RT + Targeted therapy	13	43.3	8	26.7		

Table 2. Compensating for the difference between the mean of the Rotterdam Symptom Checklist scores

Group	Measurements	Physical Symptom Disturbance		Psychological Disturbance		Activity Level		Quality of Life		Total	
		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$	
Intervention (n=30)	Pre-Test	15.93±10.18		6.23±4.54		16.40±7.23		2.97±1.54		41.53±13.08	
	Post-Test	10.59±9.52		4.22±4.98		20.00±3.33		2.30±0.87		37.11±12.91	
Control (n=30)	Pre-Test	18.06±11.834		6.03±4.75		16.06±6.37		3.10±14.03		43.26±14.03	
	Post-Test	13.50±12.93		4.46±5.20		18.38±5.57		2.77±1.42		39.12±17.48	
		F	p	F	p	F	p	F	p	F	p
Test	Time (Factor)	8.838	0.004	6.981	0.011	6.218	0.016	0.924	0.341	5.252	0.026
	Group	0.855	0.359	0.025	0.875	0.375	0.543	1.321	0.256	0.365	0.549
	time x group	0.143	0.707	0.008	0.929	1.321	0.256	0.924	0.341	0.018	0.893

Table 3. Comparison of the difference between the mean scores of the EORTC QLQ-C30 Quality of Life Scale

Group	Measurements	Functional Health Score		Symptom Score		Global Health Score		Physical Function		Role Function		Emotional Function		Cognitive Function	
		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$	
Intervention (n=30)	Pre-Test	27.16±10.03		23.43±6.17		9.53±2.91		9.97±4.38		3.37±2.13		7.23±2.88		2.97±1.10	
	Post-Test	22.33±5.85		19.29±5.65		10.48±2.59		8.15±2.57		2.48±0.80		5.78±2.85		2.78±0.85	
Control (n=30)	Pre-Test	28.66±9.54		24.50±7.27		8.97±2.70		10.10±3.76		3.20±1.79		7.47±2.94		3.73±1.57	
	Post-Test	24.76±8.98		21.50±6.38		9.64±2.75		9.00±3.49		2.81±1.63		6.42±2.86		3.35±1.38	
Test		F	p	F	p	F	p	F	p	F	p	F	p	F	p
	Time (Factor)	6.753	0.012	13.375	0.001	0.444	0.508	2.801	0.100	2.413	0.127	7.701	0.008	0.744	0.3
	Group	1.048	0.311	0.811	0.352	1.268	0.266	0.302	0.585	0.021	0.884	0.623	0.789	6.917	0.0
	Time x group	0.300	0.587	1.334	0.254	0.227	0.639	1.077	0.304	1.861	0.179	0.072	0.734	0.241	0.6

Table 4. Comparison of the difference between the mean scores of Strategies Used by Patients to Promote Health

Group	Measurements	SUPPH-stress		SUPPH -decision		SUPPH - positive attitude		SUPPH-total	
		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$		$\bar{x}\pm SD$	
Intervention (n=30)	Pre-Test	33.27±10.42		11.03±4.14		61.30±13.35		105.60±25.17	
	Post-Test	34.89±9.10		11.89±3.71		60.63±14.99		107.41±26.17	
Control (n=30)	Pre-Test	33.20±9.17		11.53±3.09		59.63±13.00		104.37±23.45	
	Post-Test	34.96±9.37		12.48±2.90		62.90±12.00		107.60±22.52	
Test		F	p	F	p	F	p	F	p
	Time (Factor)	0.253	0.617	1.578	0.215	0.302	0.585	0.010	0.621
	Group	0.001	0.075	0.209	0.650	0.218	0.642	0.042	0.839
	Time x group	0.011	0.919	0.171	0.681	0.302	0.585	0.163	0.688

Table 5. Comparison of the difference between Beck Depression Scale mean scores

Group		Measurements	
Intervention (n=30)		$\bar{x}\pm SD$	
		Pre-Test	10.23±6.40
Control (n=30)		Pre-Test	12.10±6.97
		Post-Test	9.72±8.89
		F	p
Test	Time (Factor)	2.236	0.141
	Group	1.294	0.261
Time x group		0.116	0.735

Figures

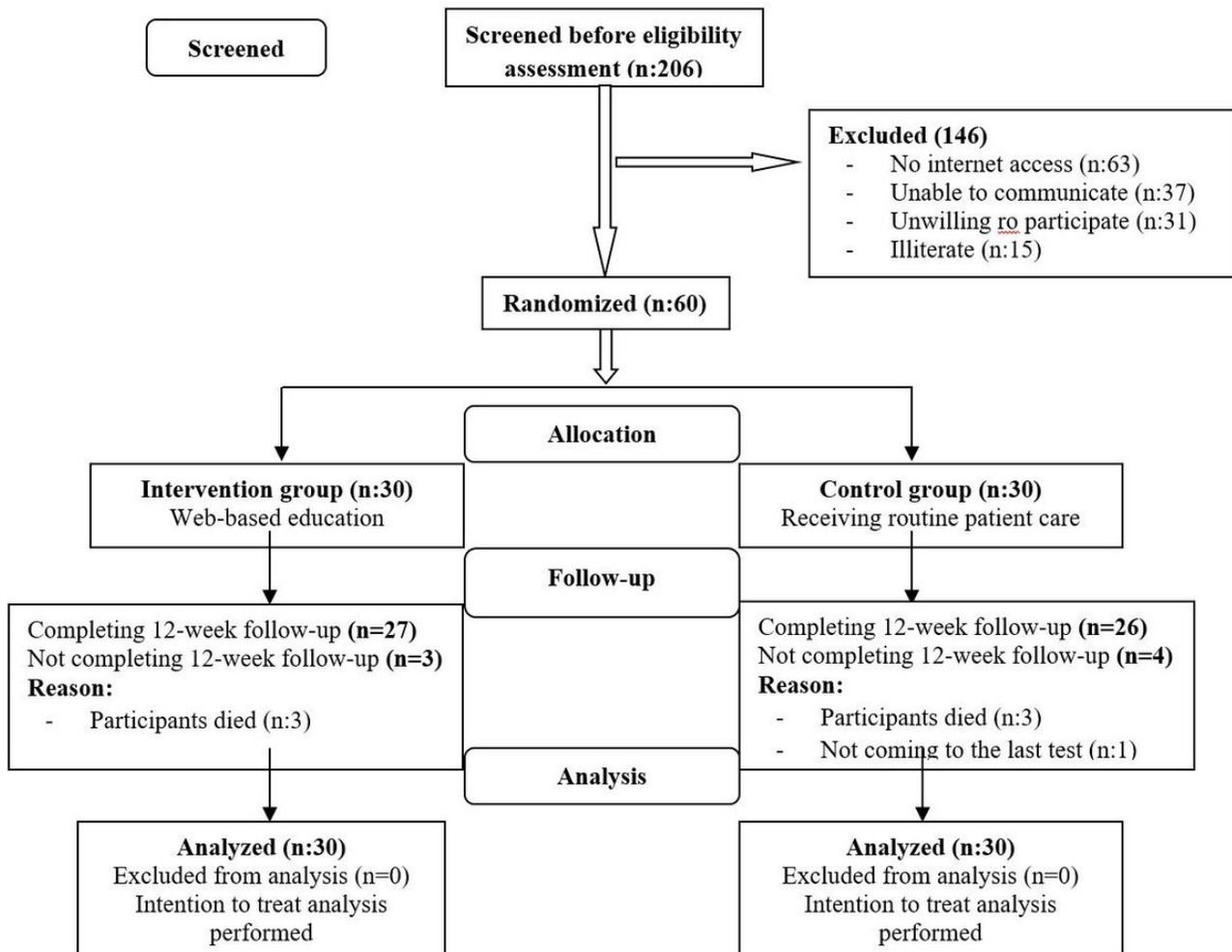


Figure 1

Flow diagram of the randomized controlled study (CONSORT 2010)

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