

The Effect of Education Delivered Using the Pecha Kucha Method on Symptom Management and Quality of Life in Cancer Patients Receiving Chemotherapy

Gülcan BAHCECIOGLU TURAN

gulcanbahcecioglu@firat.edu.tr

Firat University

Fatma KARAASLAN

Firat University Institute of Health Sciences

Zülfünaz ÖZER

Istanbul Sabahattin Zaim University

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Abstract

Aim: This study evaluated the effect of education delivered using the Pecha Kucha presentation method on symptom management and quality of life among patients with cancer receiving chemotherapy.

Methods: This randomized controlled trial included 60 patients with cancer receiving chemotherapy, who were randomly assigned to either the intervention or control group. The intervention group received education using the Pecha Kucha presentation method, whereas the control group received conventional patient education. Data were collected at baseline, immediately after the intervention, and three months later using the Personal Information Form, the Edmonton Symptom Assessment Scale (ESAS), and the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30).

Results: At the three-month follow-up, the intervention group showed significant reductions in pain, fatigue, nausea, sadness, anxiety, sleep disturbances, loss of appetite, dyspnea, oral mucositis, skin and nail changes, and hand numbness, whereas symptom severity increased in the control group. Significant group-by-time interactions were observed for all ESAS subscales ($p < 0.001$). The intervention group also demonstrated significant improvements in global health status and physical, role, emotional, and cognitive functioning. In addition, symptom scores for fatigue, nausea and vomiting, pain, dyspnea, insomnia, appetite loss, and diarrhea decreased significantly. Significant group-by-time interactions were found across all relevant EORTC QLQ-C30 domains ($p < 0.001$).

Conclusion: Education delivered using the Pecha Kucha presentation method effectively reduced symptom severity and improved quality of life in patients receiving chemotherapy. This concise, visually engaging, and structured educational approach may represent an effective nursing intervention for enhancing patient education and supportive cancer care.

Trial Registration: ClinicalTrials.gov, NCT05701930, registered on January 19, 2023.

Introduction

Cancer is a group of diseases characterized by the uncontrolled growth and proliferation of abnormal cells resulting from genetic mutations, which compete with and eventually replace normal cells [1]. Owing to its ability to metastasize through the bloodstream and lymphatic system to distant tissues and organs, cancer remains one of the leading causes of disease-related mortality worldwide [2]. A variety of treatment modalities are currently used in cancer management, including surgery, radiotherapy, chemotherapy, immunotherapy, hormone therapy, bone marrow transplantation, targeted therapies, and gene therapy [3]. Each therapeutic approach has its own advantages and limitations [4].

Chemotherapy has long been one of the most widely used treatment modalities in oncology and involves the administration of antineoplastic agents to eliminate malignant cells [5]. Primary goals of chemotherapy are to achieve disease control or cure, slow tumor progression, alleviate symptoms, and ultimately improve patients' quality of life [6]. However, because chemotherapy also affects healthy cells and tissues, it is frequently associated with a wide range of adverse effects and toxicities. Symptoms resulting from both the disease itself and its treatment can substantially impair patients' quality of life and negatively influence treatment outcomes. Common symptoms, including pain, weight loss, anorexia, alterations in taste, oral mucositis, nausea, vomiting, and alopecia, may significantly affect patients' physical, psychological, and social well-being. Therefore, the prevention and effective management of cancer- and treatment-related symptoms have become increasingly important in contemporary oncology care [7].

Nurses play a pivotal role in enhancing patients' adherence to cancer treatment, facilitating the early recognition of symptoms, and implementing effective symptom management strategies [8]. In particular, the multidimensional symptom burden experienced by patients with cancer receiving chemotherapy can profoundly affect their physical, psychological, and social functioning, leading to a marked deterioration in quality of life [9]. Consequently, nurse-led patient education is regarded as an integral component of comprehensive cancer care [8]. Educational interventions are designed to improve patients' understanding of the treatment process, enhance their ability to cope with treatment-related adverse effects, and strengthen self-care behaviors. Previous studies have demonstrated that structured, patient-centered educational programs are effective in managing chemotherapy-related symptoms, such as nausea, vomiting, fatigue, pain, and appetite loss, while also improving patients' quality of life [9]. Nevertheless, conventional educational approaches may not always achieve the desired outcomes, particularly among patients with limited attention spans or a high symptom burden [8]. In recent years, innovative educational strategies that emphasize visual learning have gained increasing attention. The Pecha Kucha (20 × 20) presentation format enables the delivery of information in a concise, visually supported, and highly structured manner, thereby improving both comprehension and information retention [10]. This approach may be particularly effective in simplifying complex health-related information and encouraging patients' active engagement in the educational process. Nurse-led education based on the Pecha Kucha method is expected to enhance patients' awareness of treatment-related symptoms, strengthen their self-management skills, and consequently improve their quality of life [10]. However, evidence regarding the effectiveness of Pecha Kucha-based educational interventions for patients undergoing chemotherapy remains limited. Therefore, further scientific evidence is needed to establish the effectiveness of innovative educational approaches in nursing practice. Accordingly, this study aimed to evaluate the effect of education delivered using the Pecha Kucha method on symptom management and quality of life among patients with cancer receiving chemotherapy.

Methods

Study Design

This study was conducted as a randomized controlled trial to evaluate the effect of education delivered using the Pecha Kucha method on symptom management and quality of life among patients with cancer receiving chemotherapy. The study was conducted and reported in accordance with the *Consolidated Standards of Reporting Trials* (CONSORT) guidelines. The trial was registered at ClinicalTrials.gov (Registration No. NCT05701930).

Study Population and Sample

The study was conducted between January 1 and December 1, 2025, in the chemotherapy unit of a public hospital and included patients with cancer receiving chemotherapy for cancer.

Participants were recruited from patients who met the following inclusion criteria: aged 18 years or older; diagnosed with cancer; currently receiving active chemotherapy; able to read and understand Turkish; no hearing, visual, or cognitive impairment that could interfere with communication; no diagnosed severe psychiatric disorder or cognitive impairment; no visual or hearing impairment that would prevent them from following the educational materials; no hospitalization due to an acute complication during the study period; and completion of all study assessments. Patients who met these criteria and voluntarily agreed to participate were included in the study. The required sample size was calculated using G*Power version 3.1.9.4 based on an a priori power analysis for a two-factor repeated-measures analysis of variance (mixed ANOVA). As no previous studies with a similar design were available, a medium effect size (Cohen's $f = 0.25$) was assumed [11]. With a significance level of 0.05, a correlation among repeated

measurements of 0.50, and a statistical power of 95%, the minimum required sample size was calculated as 54 participants (27 per group). Considering the possibility of participant attrition during follow-up, the target sample size was increased to 60 participants. A total of 60 patients with cancer receiving chemotherapy were enrolled in the study and randomly allocated to either the intervention group ($n = 30$) or the control group ($n = 30$).

Randomization

Patients who met the inclusion criteria were allocated to the intervention and control groups using a randomization method. To ensure an equal distribution of participants between groups, a computer-generated random number table was used. Based on the randomization list, participants were assigned to either the intervention group or the control group. To minimize allocation bias, the randomization sequence was generated prior to the initiation of the study, and group allocation was performed by an independent individual who was not involved in the research process. Due to the nature of the intervention, blinding of both participants and the researcher delivering the intervention was not feasible; therefore, the study was designed as a single-blind trial, with blinding applied only at the level of the statistician performing the data analysis. Accordingly, group identities were coded (e.g., Group A and Group B) before analysis, and group allocation was concealed until all statistical analyses were completed.

Data Collection Tools

Data were collected by the researcher using a Personal Information Form, the Edmonton Symptom Assessment System (ESAS), and the EORTC QLQ-C30 Quality of Life Questionnaire.

Personal Information Form

This form included questions regarding sociodemographic and clinical characteristics such as age, gender, marital status, educational level, occupation, perceived economic status, type of cancer, time since cancer diagnosis, cancer stage, and type of treatment received.

Edmonton Symptom Assessment Scale

The Edmonton Symptom Assessment System (ESAS) was originally developed by Bruera et al. to evaluate nine common symptoms in cancer patients [12]. The scale assesses pain, fatigue, nausea, depression, anxiety, insomnia, appetite loss, well-being, and dyspnea. In the Turkish validity and reliability study conducted by Kurt and Ünsar (2009), additional symptoms—skin and nail changes, oral mucositis, and hand numbness—were incorporated into the scale [13]. Each symptom is rated on a numerical scale ranging from 0 to 10, based on the patient's self-report. The most important principle in its administration is that patients select the number that best reflects the severity of each symptom according to their own perception. A score of 0 indicates the absence of the symptom, whereas a score of 10 indicates the most severe level of symptom intensity. The Cronbach's alpha coefficient of the Turkish version of the scale was reported as 0.70, while in the present study it was found to be 0.80.

EORTC QLQ-C30 Quality of Life Questionnaire

The European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Core 30 (EORTC QLQ-C30) was developed in 1987 by the European Organisation for Research and Treatment of Cancer to assess the quality of life of cancer patients and was later revised by Aaronson et al. [14]. The Turkish validity and reliability study was conducted by Güzelant et al., who reported a Cronbach's alpha coefficient of 0.70 [15]. In the present study, the

Cronbach's alpha coefficient was 0.93. The EORTC QLQ-C30 consists of 30 items organized into three main domains: global health status/quality of life, functional scales, and symptom scales. The functional scale includes physical, role, cognitive, emotional, and social functioning subscales. The symptom scale includes fatigue, nausea and vomiting, pain, dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties. Items 1–28 are rated on a four-point Likert scale (1 = not at all, 2 = a little, 3 = quite a bit, 4 = very much). For the global health status/quality of life domain, items 29 and 30 assess patients' self-rated health (ranging from 1 = very poor to 7 = excellent) and overall quality of life. These two items constitute the global health status/quality of life scale. Scores for all scales are linearly transformed to a 0–100 scale. Higher scores in the global health status and functional scales indicate better quality of life and better functioning, whereas higher scores in the symptom scales indicate a greater symptom burden or severity [15].

Intervention

The educational content provided to both the intervention and control groups was standardized to ensure consistency across groups. The training content included the identification of common symptoms experienced by patients receiving chemotherapy, coping strategies for symptom management, self-care practices, and recommendations for improving quality of life. The educational material covered pain, fatigue, nausea and vomiting, appetite loss, oral mucositis, skin and nail changes, sleep disturbances, dyspnea, depression, anxiety, and strategies for maintaining activities of daily living. The content was developed based on relevant literature and refined with expert input from oncology nursing specialists.

Pecha Kucha Education Applied to the Intervention Group

Patients in the intervention group received education using the Pecha Kucha method. The training was structured according to the Pecha Kucha technique, consisting of 20 slides. Each slide was displayed for 20 seconds, resulting in a total presentation time of 6 minutes and 40 seconds. Text usage was minimized, and visual materials, brief explanations, and simple key messages were prioritized. The presentation was delivered via PowerPoint in a computer-based format. The Pecha Kucha-based education was implemented to enhance attention span, facilitate structured and concise information delivery, and improve comprehension of key messages related to symptom management. At the end of the session, patients' questions were answered, and a brief feedback discussion was conducted.

Conventional Education Applied to the Control Group

Patients in the control group received the same educational content through a conventional education method. The traditional teaching approach included face-to-face verbal instruction and a question-and-answer format. The education was delivered by the researcher as a structured verbal presentation. At the end of the session, patients' questions were answered, and feedback was obtained. Thus, the educational content was kept consistent between groups, with only the delivery method differing.

Data Collection Procedure

Data were collected in three stages. The first measurement (pre-test) was conducted prior to the intervention. The second measurement was performed immediately after the completion of the educational intervention. The third measurement was conducted three months after the intervention. The Personal Information Form was completed only at baseline. At each measurement point, the Edmonton Symptom Assessment System (ESAS) and the EORTC QLQ-C30 Quality of Life Questionnaire were administered. All data collection instruments were administered face-to-face. For

participants who had difficulty completing the forms independently, the researcher provided assistance by reading the questions aloud without interpreting or modifying the items.

Data Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23.0. Descriptive statistics (frequencies, percentages, means, and standard deviations) were used to summarize the data. The chi-square test was applied to compare categorical sociodemographic variables between the intervention and control groups. A two-way repeated measures analysis of variance (mixed-design ANOVA) was used to evaluate between-group differences and changes over time. Effect sizes were reported using partial eta squared (η^2p). Statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Firat University prior to the commencement of the study (Date: 13 November 2024; Decision No:2024/10-1). Institutional permission was also obtained from the hospital where the study was conducted. Before data collection, participants were informed about the study, their questions were answered, and written informed consent was obtained in accordance with the principle of informed consent. Participants were informed that they could withdraw from the study at any time, ensuring respect for the principle of autonomy. Confidentiality and data protection principles were strictly followed to ensure that personal information would remain secure and not be disclosed. Anonymity and data security principles were also maintained by ensuring that participant identities were not revealed and that all collected data were kept confidential.

Findings

In this study, the sociodemographic and clinical characteristics of the intervention and control groups were compared. No statistically significant differences were found between the groups in terms of age, duration of cancer diagnosis, gender, marital status, educational level, smoking status, cancer stage, or treatment characteristics ($p > 0.05$). However, significant differences were observed between the groups regarding income being lower than expenses and the presence of comorbid diseases ($p < 0.05$) (Table 1).

According to the Edmonton Symptom Assessment System (ESAS) results, a marked reduction in symptom severity was observed in the intervention group at the 3-month follow-up. In this group, decreases were observed in pain, fatigue, nausea, depression, anxiety, sleep disturbance, appetite loss, decreased sense of well-being, dyspnea, skin and nail changes, oral mucositis, and hand numbness. In contrast, most symptoms increased in the control group at the 3-month follow-up. A statistically significant group-by-time interaction was found for all symptom subscales ($p < 0.001$) (Table 2).

Based on the quality of life findings (EORTC QLQ-C30), the intervention group demonstrated improvements in global health status and functional domains at the 3-month follow-up. Increases were observed in global health status, physical functioning, role functioning, emotional functioning, and cognitive functioning scores. In contrast, a general decline was observed in these domains in the control group. A statistically significant group-by-time interaction was found across all subscales ($p < 0.001$) (Table 3).

Regarding symptom subscales, the intervention group showed reductions in fatigue, nausea and vomiting, pain, dyspnea, insomnia, appetite loss, and diarrhea scores, and the group-by-time interaction was statistically significant ($p < 0.001$) (Table 3). These findings indicate a reduction in symptom burden in the intervention group. In contrast, most of these symptoms increased in the control group ($p < 0.001$). No statistically significant differences were observed between the groups for constipation and financial difficulties subscales ($p > 0.05$) (Table 3).

Discussion

In this study, the effect of education delivered using the Pecha Kucha method on symptom management and quality of life in patients with cancer receiving chemotherapy was evaluated. No statistically significant differences were found between the intervention and control groups in terms of sociodemographic and clinical characteristics. The similarity of baseline characteristics between the groups indicates that the study groups were comparable, providing a more reliable basis for evaluating the effects of the intervention.

In the intervention group, significant reductions were observed over three assessment time points in pain, fatigue, nausea, depression, anxiety, sleep disturbance, appetite loss, dyspnea, oral mucositis, skin and nail changes, and hand numbness. In contrast, an increase in most of these symptoms was observed in the control group. In particular, the statistically significant group $\times$ time interaction with a medium effect size across all ESAS subscales indicates that the intervention produced a more pronounced improvement over time in the intervention group compared with the control group. Similarly, Nayak and George (2023) reported that structured symptom management programs for cancer patients reduce symptom burden and improve quality of life [9]. In addition, a randomized controlled trial by Gullu Gucuyener and Karabacak (2025) demonstrated that Teach-Back-based education improved symptom management in patients with cancer receiving chemotherapy [8]. The findings of the present study are consistent with these reports.

It has been suggested that adequate patient knowledge regarding disease and treatment processes, along with effective coping strategies and active patient involvement, contributes to better symptom control and treatment management [16]. In this context, the concise, visually oriented, and engaging structure of the Pecha Kucha method may have facilitated better comprehension and retention of educational content, thereby enhancing symptom control.

Another important finding of this study was that global health status and functional subscale scores of quality of life improved significantly over time in the intervention group, with a medium effect size, whereas a declining trend was observed in most of these domains in the control group. The literature similarly indicates that structured education and supportive care interventions reduce symptom burden, enhance functional capacity, and improve multiple dimensions of quality of life [17, 18]. Furthermore, improved adaptation to disease and treatment processes has been shown to enhance self-care behaviors, facilitate daily activities, and positively influence health-related quality of life [19]. In this regard, the Pecha Kucha-based education may have encouraged patients to take a more active role in their care, thereby supporting their ability to maintain daily activities and social roles, which in turn positively influenced functional aspects of quality of life.

Regarding symptom-related domains of quality of life, significant reductions were observed in fatigue, nausea and vomiting, pain, dyspnea, insomnia, appetite loss, and diarrhea in the intervention group across the three assessment points. In contrast, most of these symptoms increased in the control group. Consistent with these findings, previous studies have reported that educational interventions reduce symptom burden and support more effective self-management, thereby improving symptom-related quality of life [9, 20, 21]. These findings suggest that early recognition of symptoms and the use of appropriate coping strategies can reduce symptom severity and its negative impact on daily functioning [22]. Accordingly, Pecha Kucha-based education may enhance patients' symptom monitoring and management skills, thereby contributing to reduced symptom burden and improved treatment

adherence. However, no statistically significant changes were observed in the constipation and financial difficulties subscales of quality of life. The absence of a significant group $\times$ time interaction in these domains suggests that the intervention did not lead to different changes over time between the groups. This finding may be explained by the multifactorial nature of constipation and financial difficulties, which are influenced by a wide range of clinical, individual, and environmental factors [23-25]. Constipation in cancer patients is associated with multiple factors, including opioid and antiemetic use, dietary habits, fluid intake, physical activity level, and disease-related characteristics [23, 26]. Therefore, an education-based intervention alone may not be sufficient to produce a significant short-term effect on constipation. Similarly, financial difficulties are strongly influenced by socioeconomic variables such as income level, employment status, insurance coverage, treatment costs, and access to healthcare services [24]. Cancer-related financial burden has been described as “financial toxicity,” which is closely associated with individual economic conditions [25]. In this context, although Pecha Kucha-based education demonstrated beneficial effects on several domains of symptom management and quality of life, the lack of significant effects on constipation and financial difficulties is an expected outcome given their multifactorial and predominantly non-educational determinants.

Study Limitations

This study has several limitations. First, the fact that the study was conducted in a single center may limit the generalizability of the findings. In addition, symptom severity and quality of life assessments were based on self-reported measures, which may introduce reporting bias. Furthermore, the follow-up period was limited to three months, which restricts the ability to evaluate the long-term effects of the Pecha Kucha-based educational intervention. Despite these limitations, the randomized controlled design and the use of valid and reliable measurement instruments represent important strengths of the study.

Conclusion

The results of this study indicate that education delivered using the Pecha Kucha method improves symptom management and enhances quality of life in patients receiving chemotherapy. Significant reductions in symptom severity, as well as improvements in global health status, functional domains, and symptom-related aspects of quality of life in the intervention group, demonstrate the effectiveness of the educational intervention. Moreover, the significant group $\times$ time interactions observed across multiple symptom and quality of life domains suggest that the observed improvements cannot be attributed solely to the effect of time, but are directly associated with the implemented educational program. In this context, the Pecha Kucha method may be considered an effective educational approach that not only enhances patients’ knowledge levels through its concise, visually oriented, and patient-centered structure, but also strengthens symptom management skills and supports treatment adherence. Based on the findings, the Pecha Kucha method may be regarded as an innovative and feasible strategy that can be incorporated into oncology nursing practice for patient education.

Declarations

Ethics approval and consent to participate

Prior to the commencement of the study, ethical approval was obtained from the Non-Interventional Clinical Research Ethics Committee of Firat University (Date: 13 November 2024; Decision No:2024/10-1). Institutional permission was also obtained from Firat University Hospital. All procedures performed in this study involving human participants were conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki

Declaration and its later amendments. Written informed consent was obtained from all individual participants included in the study. Participants were informed that their participation was voluntary and that they could withdraw at any time without any consequences. All methods were carried out in accordance with relevant guidelines and regulations.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declare that they have no competing interests.

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Authors' contributions

GBT contributed to conceptualization, methodology, investigation, and writing the original draft.

FK contributed to methodology and writing – review and editing.

ZÖ contributed to formal analysis, visualization, and writing – review and editing.

All authors read and approved the final manuscript.

Trial registration

The study was conducted and reported in accordance with the Consolidated Standards of Reporting Trials (CONSORT) guidelines. The trial was registered at ClinicalTrials.gov (Registration No. NCT05701930).

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Tables

Table 1. Comparison of Demographic and Clinical Characteristics of the Groups

Variable		Control Group (n=30)		Intervention Group (n=30)		z	p ^a
		Ort±Ss	Min-Max (Median)	Ort±Ss	Min-Max (Median)		
Age		55.47±9.27	32-69 (57.5)	57.13±7.15	40-67 (57.5)	-0.348	0,728
Year of Cancer Diagnosis (Year)		2.53±0.73	1-4 (2)	2.43±0.57	1-3 (2)	-0.347	0.729
		n (%)		n (%)		χ ²	p ^{**}
Gender	Female	13 (%48.15)		14 (%51.85)		0.001	0.999
	Male	17 (%51.52)		16 (%48.48)			
Marital Status	Married	27 (%50.94)		26 (%49.06)		0.162	0.999
	Single	3 (%42.86)		4 (%57.14)			
Education Level	Literate	3 (%100)		0 (%0)		3.939	0.414
	Elementary School	18 (%47.37)		20 (%52.63)			
	Middle School	4 (%50)		4 (%50)			
	High School	3 (%37.5)		5 (%62.5)			
	Higher Education and Above	2 (%66.67)		1 (%33.33)			
Income Level	My Income Covers My Expenses	1 (%10)		9 (%90)		9.932	0.007**
	My Income Equals My Expenses	3 (%100)		0 (%0)			
	My Income Is Less Than My Expenses	26 (%55.32)		21 (%44.68)			
Employment Status	Employed	2 (%100)		0 (%0)		2.069	0.492
	Unemployed	28 (%48.28)		30 (%51.72)			
Smoking	Yes	4 (%66.67)		2 (%33.33)		0.741	0.671
	No	26 (%48.15)		28 (%51.85)			
Health Status	Fair	19 (%46.34)		22 (%53.66)		0.308	0.579
	poor	11 (%57.89)		8 (%42.11)			
Cancer Type	Lung	7 (%70)		3 (%30)		15.234	0.085
	Breast	9 (%69.23)		4 (%30.77)			
	Colon	7 (%70)		3 (%30)			
	Pancreas	2 (%33.33)		4 (%66.67)			
	Stomach	4 (%44.44)		5 (%55.56)			

	Ovarian	1 (%33.33)	2 (%66.67)		
	Prostate	0 (%0)	4 (%100)		
	Thyroid	0 (%0)	1 (%100)		
	Cervical	0 (%0)	2 (%100)		
	Bladder	0 (%0)	2 (%100)		
Cancer Stage	1	2 (%33.33)	4 (%66.67)	1.894	0.595
	2	12 (%50)	12 (%50)		
	3	13 (%59.09)	9 (%40.91)		
	4	3 (%37.5)	5 (%62.5)		
Other diseases	yes	19 (%67.86)	9 (%32.14)	5.424	0.020*
	No	11 (%34.38)	21 (%65.63)		
Comorbidities	No	11 (%34.38)	21 (%65.63)	13.483	0.061
	COPD	5 (%71.43)	2 (%28.57)		
	Hypertension	8 (%72.73)	3 (%27.27)		
	Diabetes	4 (%80)	1 (%20)		
	Anemia	2 (%100)	0 (%0)		
	Hyperthyroidism	0 (%0)	1 (%100)		
	Asthma	0 (%0)	1 (%100)		
	Chronic Kidney Disease	0 (%0)	1 (%100)		
Treatments Received	Chemotherapy	5 (%45.45)	6 (%54.55)	7.508	0.186
	Surgical Treatment	1 (%100)	0 (%0)		
	Chemotherapy-Radiotherapy-Surgery	4 (%66.67)	2 (%33.33)		
	Chemotherapy-Radiotherapy	5 (%31.25)	11 (%68.75)		
	Chemotherapy-Radiotherapy-Hormone Therapy	0 (%0)	2 (%100)		
	Chemotherapy-Surgery	15 (%62.5)	9 (%37.5)		
Session Number	1	1 (%33.33)	2 (%66.67)	4.689	0.698
	2	1 (%20)	4 (%80)		
	3	4 (%44.44)	5 (%55.56)		
	4	10 (%66.67)	5 (%33.33)		

	5	4 (%44.44)	5 (%55.56)		
	6	7 (%58.33)	5 (%41.67)		
	7	2 (%50)	2 (%50)		
	8	1 (%33.33)	2 (%66.67)		
Treatment Frequency	1-2 Months	15 (%65.22)	8 (%34.78)	6.730	0.081
	3-4 Months	13 (%50)	13 (%50)		
	6 Months	2 (%20)	8 (%80)		
	1 Year or More	0 (%0)	1 (%100)		

Mann-Whitney U Test **Chi-Square Test **p<0.01 *p<0.05

Table 2. Comparison of the Subscales of the Edmonton Symptom Assessment Scale by Group and Over Time

Variable	Group	Before the Intervention	After the Intervention	3. Ay	Group×Time p	η^2p^*
Pain	Intervention group	6.03±1.90	6.03±1.90	4.87±2.01	<0.001**	0.689
	Control group	5.93±1.64	5.93±1.64	7.03±1.54		
Fatigue	Intervention group	7.17±1.86	7.17±1.86	6.27±1.84	<0.001**	0.614
	Control group	6.33±1.58	6.33±1.58	7.53±1.36		
Nausea	Intervention group	4.33±1.49	4.33±1.49	2.90±1.52	<0.001**	0.730
	Control group	5.40±2.14	5.43±2.11	6.17±2.21		
Sadness	Intervention group	8.03±1.83	7.83±1.82	6.93±1.82	<0.001**	0.642
	Control group	7.27±1.46	7.27±1.46	8.43±1.36		
Anxiety	Intervention group	7.67±1.97	7.40±1.92	6.43±1.87	<0.001**	0.672
	Control group	7.43±1.41	7.43±1.41	8.57±1.30		
Sleep	Intervention group	6.50±1.74	6.50±1.74	5.10±1.83	<0.001**	0.741
	Control group	7.10±1.63	7.10±1.63	8.13±1.68		
Appetite	Intervention group	6.23±1.91	6.23±1.91	5.17±1.90	<0.001**	0.711
	Control group	6.43±1.83	6.43±1.83	7.27±1.84		
Well-being	Intervention group	7.47±1.94	7.13±2.03	6.27±1.96	<0.001**	0.677
	Control group	7.30±1.49	7.30±1.49	8.10±1.35		
Shortness of Breath	Intervention group	3.40±2.90	3.40±2.90	2.33±2.82	<0.001**	0.599
	Control group	3.03±2.40	3.03±2.40	3.73±2.60		
Changes in Skin and Nails	Intervention group	3.40±2.44	3.43±2.46	2.43±2.50	<0.001**	0.620
	Control group	3.23±2.03	3.23±2.03	3.97±2.24		
Mouth Sores	Intervention group	2.97±2.17	2.97±2.17	1.80±1.81	<0.001**	0.604
	Control group	2.50±1.96	2.50±1.96	3.17±2.17		
Numbness in the Hands	Intervention group	2.03±1.43	2.03±1.43	1.23±1.28	<0.001**	0.593
	Control group	2.00±1.95	2.00±1.95	2.60±2.16		

*Mixed ANOVA, **p<0.05

Table 3. Comparison of the Subdimensions of the Quality of Life Scale by Group and Over Time

Variable		Group	Before the Intervention	After the Intervention	3. Ay	Group×Time p	η ² p
General Health Status/Quality of Life		Intervention group	11.39±10.38	11.39±10.38	26.67±15.23	<0.001**	0.759
		Control group	22.22±14.73	22.22±14.73	10.56±11.14		
Functional Scale	Physical Function	Intervention group	29.56±18.50	29.56±18.50	52.00±16.74	<0.001**	0.681
		Control group	32.67±20.89	32.67±20.89	18.67±15.70		
	Role Function	Intervention group	27.22±22.09	27.22±22.09	47.78±23.87	<0.001**	0.530
		Control group	30.56±22.78	30.56±22.78	20.00±20.72		
	Emotional Function	Intervention group	21.94±25.57	21.94±25.57	54.44±21.07	<0.001**	0.555
		Control group	27.22±21.10	27.22±21.10	8.33±13.67		
	Cognitive Function	Intervention group	38.33±24.43	38.33±24.43	68.89±19.44	<0.001**	0.650
		Control group	45±27.73	45±27.73	38.89±25.65		
	Social Function	Intervention group	18.33±22.47	18.33±22.47	43.33±19.87	<0.001**	0.146
		Control group	32.22±33.31	32.22±33.31	22.78±31.71		
Symptom Scale	Fatigue	Intervention group	82.59±22.35	82.59±22.35	56.67±17.1	<0.001**	0.776
		Control group	74.44±16.8	74.44±16.8	92.96±12.88		
	Nausea and Vomiting	Intervention group	56.67±32.34	56.67±32.34	23.33±20.81	<0.001**	0.720
		Control group	46.11±26.15	46.11±26.15	50.56±27.15		
	Pain	Intervention group	76.67±25.37	76.67±25.37	51.11±17.47	<0.001**	0.750
		Control group	71.11±19.04	71.11±19.04	86.11±15.83		
	Dyspnea	Intervention group	50±30.01	50±30.01	21.11±28.34	<0.001**	0.705
		Control group	45.56±28.34	45.56±28.34	45.56±28.34		
	Insomnia	Intervention group	77.78±26.74	77.78±26.74	51.11±16.91	<0.001**	0.784
		Control group					

	Control group	75.56±19.44	75.56±19.44	94.44±12.63		
Loss of Appetite	Intervention group	78.89±23.95	78.89±23.95	50±16.95	<0.001**	0.759
	Control group	75.56±19.44	75.56±19.44	87.78±18.54		
Constipation	Intervention group	10±19.87	10±19.87	3.33±10.17	0.157	0.031
	Control group	5.56±12.63	5.56±12.63	5.56±12.63		
Diarrhea	Intervention group	51.11±39.86	51.11±39.86	27.78±19.74	<0.001**	0.740
	Control group	53.33±29.81	53.33±29.81	74.44±33.54		
Financial Problems	Intervention group	40±34.35	40±34.35	33.33±26.26	0.468	0.013
	Control group	31.11±31.48	31.11±31.48	34.44±35.54		

*Mixed ANOVA, **p<0.05

Figures

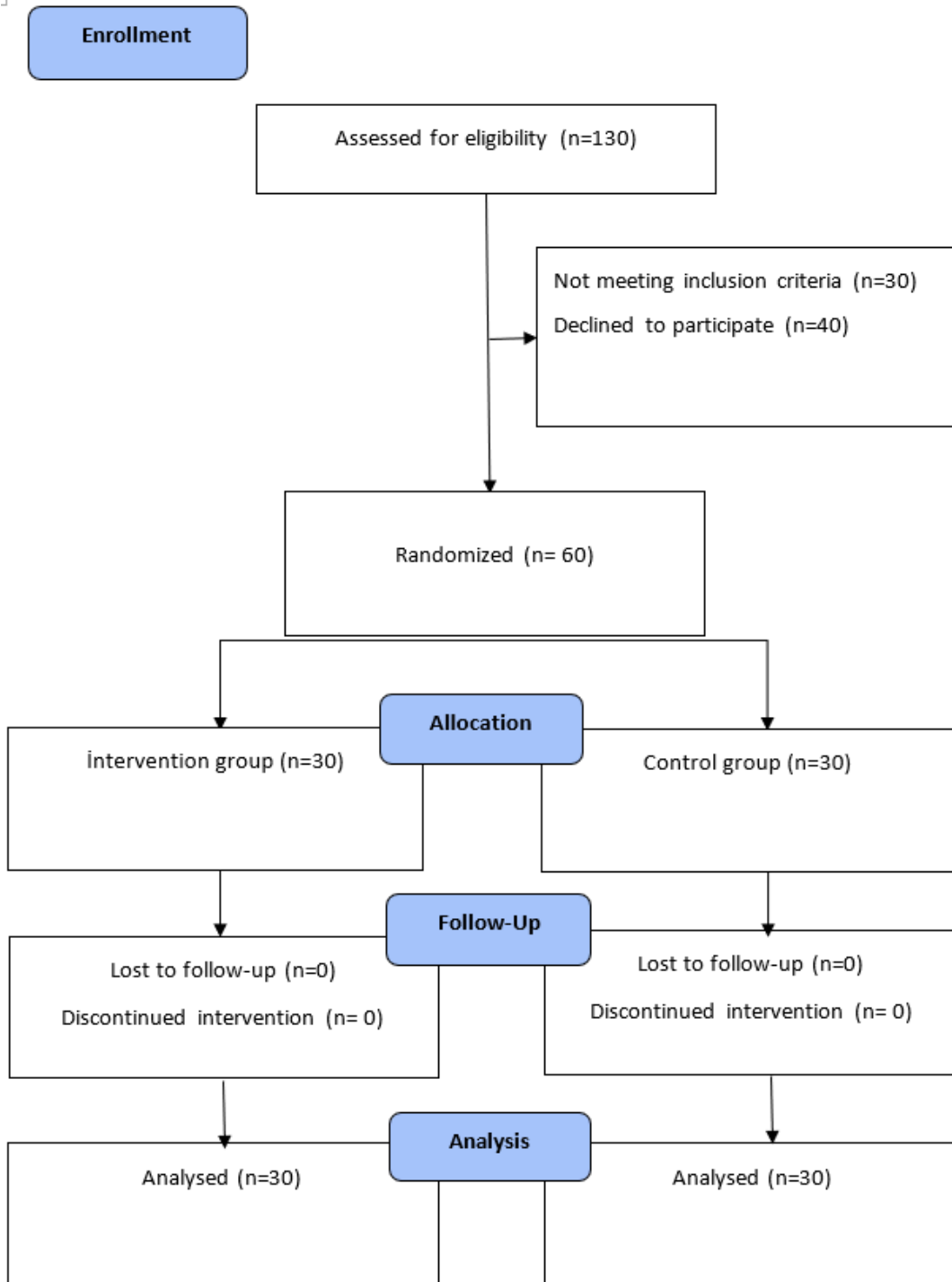


Figure 1

CONSORT Diagram