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RESEARCH ARTICLE

Impact of Structured Education on the Stress Levels and Health Perceptions of Caregivers of Patients Undergoing Colorectal Cancer Surgery: Quasi-Experimental Study

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ABSTRACT

Aim: This study evaluated the impact of structured education on the stress levels and health perceptions of caregivers of patients undergoing colorectal cancer surgery.

Method: A pretest-posttest quasi-experimental design was used. This study was done in a university hospital's general surgery department. Caregivers of patients with colorectal cancer got stress management and health perception education. A qualified researcher led face-to-face sessions with a booklet and PowerPoint presentation. Pretests and posttests were taken on the 1st day of hospitalization and shortly before release. The Caregiver Stress Scale (CSS) was used to assess stress levels, and the Perception of Health Scale (PHS) was used to evaluate caregivers' health perceptions. Data analysis was performed using the SPPS 29.0 package program.

Results: The study included 65 caregivers. The mean age of the patients was 61.85±14.85 years, with 80.0% diagnosed with colon cancer. Caregivers had a mean age of 52.93±10.67 years; 36.9% had a primary school education, 41.5% were employed, and 73.8% provided care for at least four weeks. The pre-education mean CSS score was 9.26±1.38, decreasing to 6.36±3.77 post-education ($p<0.001$). The mean PHS score considerably rose from 44.49±2.93 to 53.58±7.01 ($p<0.001$). Stress and health perception were positively impacted by patient education, care equipment, caregiver education, marital status, employment status, and caregiving duration ($p<0.05$).

Conclusion: Structured education reduced stress and improved health perceptions in colorectal cancer caregivers. This intervention filled a research gap by emphasizing caregiver well-being over patient-centered education. Caregivers need resilience-building strategies and caregiver-centered education in colorectal cancer care.

Keywords: Caregiver stress, caregiver, colorectal cancer, health perception, structured education, psychological stress

Introduction

Colorectal cancer is the second leading cause of cancer-related deaths worldwide. In 2020, the World Health Organization reported 1.9 million new colorectal cancer cases and 930,000 deaths. The highest incidence rates are observed in Europe, Australia, and New Zealand, whereas Eastern Europe has the highest fatality rates. By 2040, colorectal cancer cases are projected to increase by 63% to 3.2 million annually, with fatalities rising by 73% to 1.6 million per year.[1] In Türkiye, this global trend is also evident. According to the 2018 Ministry of Health data, colorectal cancer is the third most common malignancy in both sexes. GLOBOCAN 2022 identified colorectal cancer as the fourth most frequent cancer worldwide. Despite its high prevalence, public awareness of colorectal

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cancer screening remains low, underscoring the need for targeted awareness programs.

Advancements in medical technology and a deeper understanding of colorectal cancer pathophysiology have expanded treatment options, including endoscopic procedures, surgery, radiation, immunotherapy, targeted treatments, and palliative chemotherapy.[2,3] These innovations have carried patient care from hospitals to home settings, making caregivers essential in managing complex medical needs such as medication administration, symptom management, and coordination with healthcare professionals. However, caregiving places a significant physical, emotional, and financial burden on caregivers, leading to persistent stress, fatigue, and diminished overall well-being.[2,3]

This increasing caregiving burden negatively impacts caregivers' physical and mental health, as well as their self-perception. Balancing symptom management, emotional support, medical follow-ups, and daily care can reduce caregivers' quality of life.[4] Studies indicate that increased caregiving responsibilities are associated with poorer health perception and negative health behaviors.[5] Health outcomes depend on an individual's perception of their biological, psychological, and social well-being. A lower health perception often leads to reduced healthcare utilization, lower quality of life, and an increased risk of illness.[6]

Although caregivers play a crucial role in postoperative care, research primarily focuses on education programs aimed at improving the patient's care and social adaptation. However, there is a notable gap in the literature regarding interventions designed to empower caregivers themselves. Most existing studies emphasize patient-centered education, whereas this study focuses on caregivers, aiming to strengthen their coping mechanisms and improve their well-being. Addressing this gap is essential for enhancing caregiver support systems and ensuring sustainable care for patients with colorectal cancer.

Objective

This study aims to evaluate the effect of structured education on the stress levels and health perceptions of caregivers of patients undergoing colorectal cancer surgery.

The study hypotheses were as follows:

$H1._1$. There is a significant difference in mean scores on the Caregiver Stress Scale (CSS) before and after structured education for caregivers of patients undergoing colorectal cancer surgery.

$H1._2$. There is a significant difference in the mean scores on the Perception of Health Scale (PHS) before and after structured education for caregivers of patients undergoing colorectal cancer surgery.

Materials and Methods

Design

A prospective quasi-experimental, non-randomized study was conducted.[7] Randomization was not used due to the potential for interactions between caregivers, which could lead to information exchange and influence the effects of the intervention, making it difficult to maintain group independence. This research was conducted as a single group pre-test/post-test quasi-experimental study. The Transparent Reporting of Evaluations with Non-randomized Designs (TREND) checklist was utilized to standardize the reporting of non-randomized controlled trials. Figure 1 illustrates the comprehensive study design.

Setting

The study was conducted through face-to-face interviews with caregivers of patients admitted to the general surgery inpatient clinic of a Dokuz Eylül University Hospital between April 1, 2024, and June 30, 2024. Data was collected by trainee nurses on the research team.

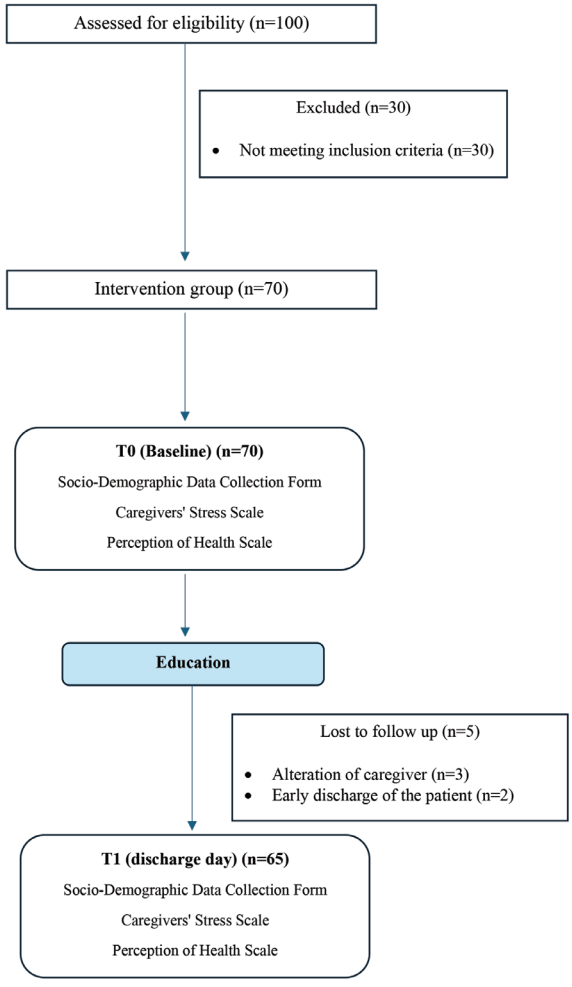

Figure 1. Flow diagram of enrolled patients

Participants

The sample of the study consisted of caregivers of patients who would undergo colorectal cancer surgery. A purposive sampling method was used. The inclusion criteria were as follows: caregivers of patients who would undergo colorectal cancer surgery; caregivers who voluntarily agreed to participate in the study; caregivers who could speak, understand, and write in Turkish; caregivers with a complete person, place, and time orientation; and caregivers over 18 years of age. The exclusion criteria were as follows: caregivers of patients with metastatic colorectal cancer and caregivers with acute health problems (respiratory system diseases, gastrointestinal system diseases, infectious diseases, etc.).

Sample Size

The study's sample size was calculated using G*Power 3.1.9.2 at a 95% confidence interval. Cohen's d was calculated based on the d-value. A Cohen's d-value greater than 0.8 was considered substantial.[8] The sample size calculated according to this value was 52 participants, with a theoretical power of 0.80. Considering a 25% loss rate, 65 caregivers were included in the study. A post-hoc power analysis was then performed based on the caregiver stress parameter. In this analysis, the power was determined to be 1.00.

Intervention Group

All investigators produced structured educational content according to established guidelines.[8-12] The developed education content was reviewed by the senior author, an expert in the field. The focus of this structured education content was to increase caregiver resilience. The education material included the following topics: categories of caregivers, caregiver responsibilities, assessment of patient care needs, home care, institutional care settings, caregiver self-care strategies (stress management, balancing work and caregiving, family resolution, and family life management), and evaluation of alternative care options. Two experts were then verbally consulted, and a preliminary study was conducted with one caregiver. Once the education content was finalized, it was printed as a booklet. At the same time, a PowerPoint presentation was prepared as visual teaching material to be used during the education. After all processes were completed, the first researcher trained the trainee nurses on how to provide structured education and the data collection process before data collection began. A structured education trial was conducted with each of them to ensure that all trainee nurses provided standardized training to caregivers.

The first researcher was an assistant professor of surgical nursing who conducted research focused on colorectal surgery. The trainee nurses were senior students who had completed a surgical nursing course and worked as trainee nurses in inpatient clinics. The senior author was a professor of surgical nursing with expertise in colorectal surgery.

Data Collection

Patients admitted to the general surgery inpatient clinic for colorectal cancer surgery were identified through the inpatient list of the clinic. The caregiver was informed, and consent was obtained after visiting the patient's clinic, during which the CSS and HPS were completed. Upon completing these scales, the caregiver received education through visual education materials and written brochures for colorectal cancer surgery. The education was provided by trainee nurses from the research team who had received training on structured education. An optimal and quiet location within the ward was selected for the education. The caregivers were asked to fill in the CSS and PHS on the day the patient was discharged. Figure 1 shows the study's data collection process.

Measurement Instruments

Data collection involved using the sociodemographic data collection form, the CSS, and the PHS.

Sociodemographic Data Collection Form

The study included questions regarding the sociodemographic characteristics of the participating caregivers. The assessment encompassed inquiries about the caregiver's age, gender, degree of closeness to the patient, marital status, educational background, profession, employment status, caregiving responsibilities, duration of care provided, support received, presence of chronic illness, and regular medication usage.[13-17] The assessment encompassed inquiries regarding the patient, including age, gender, diagnosis, planned surgery, and presence of stoma.

Caregiver Stress Scale

The scale was developed by Robinson[17] in 1983 to assess the caregiving burden experienced by caregivers. The CSS helps identify families potentially facing caregiving concerns rapidly. The burden measurements in caregiving comprise 13 items. At least one item each exists concerning the work situation, financial situation, physical condition, social situation, and time. A positive response to seven or more items on the scale signifies an elevated stress level. This evaluation tool can assess people of all ages who have taken on the duty of caring for an older adult. The scale was evaluated with a cohort of 132 individuals who supported hospitalized older adults, and it was found to be appropriate for caregivers across all age groups. The scale designed to assess the subjective burden of caregivers for patients with cancer was utilized with family caregivers of patients aged 65 and older who had received hip and heart surgery. The original version of the scale comprises 13 items derived from 10 everyday stressors identified through interviews with adult children caring for

elderly parents, alongside 3 stressors identified from a review of pertinent literature. All 13 items on the scale represent a stressor. The scale score is derived by aggregating the 0 and 1 responses from the 13 items. The scale exhibited a Cronbach's alpha value of 0.86. Robinson[17] Uğur and Fadıloğlu[18] conducted a validity and reliability study of the scale in 2006, involving 132 patients and their relatives, to examine the caregiving burden experienced by individuals providing home care to oncology patients. Cronbach's alpha coefficient was determined to be 0.77.[18] Permission to use the scale was obtained from Uğur and Fadıloğlu[18] on October 27, 2023. Cronbach's alpha coefficient in this study was determined to be 0.85.

Perception of Health Scale

This scale, developed initially by Diamond et al.[19] and subsequently adapted into Turkish by Kadıoğlu and Yıldız,[20] comprised 15 items and utilized a 5-point Likert-type format. The scale's total scores range from 15 to 75, with higher scores reflecting a greater level of health perception and lower scores indicating a diminished level of health perception. Questions 1, 5, 9, 10, 11, and 14 are affirmative, whereas questions 2, 3, 4, 6, 7, 8, 12, 13, and 15 are negative assertions. The scale comprises four sub-dimensions: control center, precision, significance of health, and self-awareness. The initial study of the scale indicated a Cronbach's alpha coefficient of 0.77 for the general population. Permission to use the scale was obtained from Kadıoğlu and Yıldız,[20] on October 29, 2023. Cronbach's alpha coefficient in this study was determined to be 0.82.

Statistical Analysis

Data from the study was analyzed using the Statistical Package for the Social Sciences software, version 29.0. The Kolmogorov-Smirnov test, kurtosis, skewness values, and QQ plot were analyzed to assess the normality of the data distribution. The evaluation of kurtosis and skewness values followed the methodology outlined in the article by Zhou and Shao.[21] Descriptive characteristics included numerical values, percentages, means, standard deviations, and minimum and maximum values. Correlation, variance, and t-tests were used to analyze the influence of caregiver and patient characteristics on caregiver stress and health perceptions. A pairwise t-test examined differences in caregivers' stress and health perceptions before and after the education.

Ethical Approval

Permission was obtained from the Dokuz Eylül University Non-interventional Research Ethics Committee (approval number: 2023/40-21, dated: 13.12.2023). Permission was obtained from the department of general surgery (number: E-968337284-100-822054, dated: 08.12.2023). The research adhered to ethical guidelines, with caregivers informed of the purpose of the study in accordance with the tenets of the Declaration of Helsinki, followed by signing informed consent forms.

Results

Descriptive Characteristics of the Patients

The mean age of the patients was 61.85±14.85 years, with 55.4% identifying as women and 60% having completed primary education. Colon cancer was present in 80% of patients, whereas 20% had rectal cancer. Partial colectomy was performed in 61.5% of patients, and 23.1% had a stoma. In 90.8% of patients, only a peripheric intravenous intravenous catheter (PIV) was present as care equipment (Table 1).

When the stress level and health perception of caregivers were compared with the descriptive characteristics of the patients, age, gender, diagnosis, presence of chronic disease, type of surgery, and presence of stoma had no significant effect on caregiver stress levels and health perceptions ($p>0.05$). A significant relationship was found between education level and health perception ($p=0.002$). Caregivers with primary education had the lowest level of health perception, whereas those with higher education had the highest level. The type of catheter used in the patient was found to be effective on the stress level of caregivers ($p=0.005$). A significant difference was found in terms of stress level between the caregivers of patients with only PIV catheters and those of patients with central venous catheters (CVC) and drains (Table 1).

Descriptive Characteristics of the Caregivers

The mean age of caregivers was 52.93±10.67 years, with 66.2% identifying as women and 36.8% having completed primary education. About 40% of caregivers were spouses of the patients, whereas 58.5% were unemployed. Additionally, 38.5% had chronic illnesses, and 35.4% were taking medication regularly. More than half (53.8%) of caregivers were responsible for other individuals in addition to the patient. The duration of caregiving was 4 weeks or less for 73.8% of participants, whereas only 13.8% received support during the caregiving process (Table 2).

When the descriptive characteristics of caregivers were compared with stress level and health perception, it was observed that age, gender, degree of closeness with the patient, presence of chronic disease, regular medication use, and receiving support during the care process did not significantly affect caregiver stress levels and health perceptions ($p>0.05$). A significant relationship was found between education and stress levels ($p=0.003$). Caregivers with primary education had the highest stress level, and those with higher education had the lowest. A significant

Table 1. Comparison of the patient's descriptive characteristics with caregivers' stress and perception of health

Descriptive characteristics of patients	n, %	Mean ± SD	Pre-education Caregiver Stress Scale Test statistic p-value	Post-education Caregiver Stress Scale Test statistic p-value	Pre-education Perception of Health Scale Test statistic p-value	Post-education Perception of Health Scale Test statistic p-value
Years	65, 100.00	61.85±14.85	r=-0.064 p=0.612	r=-0.114 p=0.367	r=-0.055 p=0.664	r=-0.021 p=0.867
Gender						
Female	36, 55.40		t=1.400	t=1.475	t=0.102	t=0.070
Male	29, 44.60		p=0.166	p=0.145	p=0.918	p=0.944
Education						
Primary education	39, 60.00					
Secondary education	15, 23.10		F=0.840	F=0.715	F=0.065	F=6.828
Higher education	11, 16.90		p=0.436	p=0.493	p=0.937	**p=0.002***
Diagnosis						
Rectum cancer	13, 20.00		t=-0.434	t=-0.255	t=0.476	t=0.415
Colon cancer	52, 80.00		p=0.668	p=0.801	p=0.640	p=0.683
Chronic disease						
Yes	28, 43.10		t=-0.235	t=0.569	t=0.635	t=-0.642
No	37, 56.90		p=0.815	p=0.571	p=0.528	p=0.523
Type of surgery						
Total colectomy	2, 3.10					
Partial colectomy	40, 61.50					
Hemicoectomy	3, 4.60		F=1.253	F=0.376	F=0.348	F=0.029
Lower anterior resection	20, 30.80		p=0.299	p=0.771	p=0.791	p=0.993
Existence of stoma						
Yes	15, 23.10		t = 0.202	t=0.033	t=1.443	t=0.408
No	50, 76.90		p = 0.842	p=0.974	p=0.160	p=0.688
Maintenance equipment						
PIV	59, 90.80					
PIV and CVC	2, 3.10					
PIV and foley catheter	2, 3.10		F=4.773	F=1.606	F=0.392	F=2.477
PIV and drain	2, 3.10		**p=0.005***	p=0.197	p=0.759	p=0.070

*p<0.05. PIV: Peripheric intravenous catheter, CVC: Central venous catheter, r: Correlation test, t: t-test in independent groups, F: Analysis of variance test, SD: Standard deviation

difference was found between marital status and health perception (p=0.016). Single caregivers had the highest level of health perception. There was a significant difference between employment status and health perception (p=0.007). The health perceptions of employed caregivers were higher than those of non-employed caregivers. A significant relationship was found between the duration of care and stress level (p=0.011). Caregivers who provided care for four weeks or less had the lowest stress level, whereas caregivers who provided care for 9 weeks or more had the highest stress level (Table 2).

The Impact of Structured Education on Stress Levels and Health Perceptions of Caregivers

The caregivers' mean pre-structured education CSS score was 9.26±1.38, whereas the post-education score significantly decreased to 6.36±3.77 (t=7.080, p=0.000), indicating a statistically significant reduction in stress levels (Table 3). Similarly, the caregivers' mean PHS score increased significantly from 44.49±2.93 before education to 53.58±7.01 after education (t=-9.557, p=0.000) (Table 3). Statistically significant increases were observed in the subdimensions of health perception, including self-awareness (t=-9.410,

Table 2. Comparison of the caregivers' descriptive characteristics with caregivers' stress and perception of health

Descriptive characteristics of patients	n, %	Mean ± SD	Pre-education Caregiver Stress Scale Test statistic p-value	Post-education Caregiver Stress Scale Test statistic p-value	Pre-education Perception of Health Scale Test statistic p-value	Post-education Perception of Health Scale Test statistic p-value
Years	65, 100.00	52.93±10.67	r=-0.029 p=0.822	r=-0.137 p=0.278	r=0.013 p=0.915	r=-0.078 p=0.535
Gender						
Female	43, 66.20		t=-0.427	t=-0.387	t=-1.276	t=-0.855
Male	22, 33.80		p=0.671	p=0.701	p=0.209	p=0.397
Education						
Primary education	24, 36.90					
Secondary education	20, 30.80		F=0.559	F=0.091	F=0.834	F=6.409
Higher education	21, 32.30		p=0.575	p=0.913	p=0.439	**p=0.003***
Proximity to the patient						
Parent	3, 4.60					
Spouse	26, 40.00					
Child	21, 32.30		F=0.463	F=0.243	F=0.803	F=0.257
Relative	15, 23.10		p=0.709	p=0.866	p=0.497	p=0.856
Marital status						
Married	55, 84.60		t=-0.095	t= -0.986	t=1.865	t=-2.687
Single	10, 15.40		p = 0.933	p = 0.344	p=0.081	**p=0.016***
Work status						
Working	27, 41.50		t=0.686	t=0.470	t=1.002	t=2.809
Not working	38, 58.50		p=0.496	p=0.640	p=0.311	**p=0.007***
Chronic disease						
Yes	23, 35.40		t=0.090	t=-0.216	t=0.974	t=0.835
No	42, 64.60		p=0.928	p=0.830	p=0.334	p=0.408
Regular use of medication						
Yes	23, 35.40		t=-0.003	t=-0.441	t=0.799	t=-1.141
No	42, 64.60		p=0.998	p=0.661	p=0.428	p=0.260
Status of the person for whom he/she is responsible						
Yes	35, 53.80		t=-0.028	t=-0.908	t=0.066	t=-0.899
No	30, 46.20		p=0.978	p=0.367	p=0.947	p=0.372
Maintenance period	48, 73.80					
4 weeks						
4-6 weeks	3, 4.60		F=4.840	F=3.429	F=0.217	F=3.251
9 weeks and over	14, 21.50		**p=0.011***	**p=0.039***	p=0.806	**p=0.045***
Receive support during the care process						
Yes	9, 13.80		t=-0.822	t=-0.105	t=-1.156	t=1.426
No	66, 86.20		p=0.432	p=0.919	p=0.271	p=0.182

*p<0.05. r: Correlation test, t: t-test in independent groups, F: Analysis of variance test, SD: Standard deviation

Table 3. The impact of structured education on caregivers' stress levels and health perceptions

Variable	Pre-education (Mean ± SD)	Post-education (Mean ± SD)	t[a]	p-value
Caregiver Stress Scale	9.26±1.38	6.36±3.77	**7.080**	**0.000***
Perception of Health Scale	44.49±2.93	53.58±7.01	**-9.557**	**0.000***
Center of control	15.04±1.72	14.67±4.04	0.662	0.492
Self-awareness	8.66±1.16	11.26±1.73	**-9.410**	**0.000***
Certainty	11.56±1.11	13.98±3.99	**-4.859**	**0.000***
Importance of health	9.21±1.48	13.66±1.33	**-19.600**	**0.000***

*p<0.05, SD: Standard deviation , t[a]: Paired-samples t-test

p=0.000), certainty about health (t=-4.859, p=0.000), and perceived importance of health (t=-19.600, p=0.000) (Table 3). These results indicate that structured education effectively reduced caregivers' stress levels and improved their health perceptions across multiple dimensions.

Discussion

This study examined how structured education for colorectal cancer surgical caregivers affected stress and health perceptions. Structured education greatly lowered caregivers' stress and improved their health views, as shown in the literature.[22-26] Structured education improved caregivers' health processes involvement, according to this study.

The Impact of Organized Education on Caregiver Stress Levels

The results show that structured education significantly reduced caregiver stress. Research suggests that chronic illness caregivers experience high stress.[4,13,14] Caregivers watching surgery may feel stressed due to uncertainty and fear. This study found that caregivers with high stress levels before education had lower stress thereafter. The instructional content provided insight on caregiving issues, decreasing uncertainty and stress. Additionally, answering caregivers' questions and offering emotional support during schooling reduced stress. Educational content focused on caregiving reduced caregiver issues; research shows that structured cancer caregiver education reduces stress, anxiety, and sadness. Information and support programs also lessen caregiver stress.[15,16] A randomized controlled experiment found that needs-based education reduced the anxiety of families who had patients with cancer better than organized education.[27] Similarly, caregiver education in pediatric oncology improved clinical outcomes, such as reducing CVC infections and emergency department visits.[28] These findings highlight the importance of tailoring educational programs to caregivers' specific needs to maximize their effectiveness in reducing stress and improving caregiving outcomes.

The Impact of Structured Education on Caregivers' Health Perception

Health perception is a key concept that describes how people view their health and how this affects their health practices.[6] Our study found that structured education improved caregivers' health perceptions, except for locus of control. This shows that education increases health awareness and stress management. The educational content improved caregivers' health assessment and motivation to live healthily. Improved health perception reduces caregiver role tensions and exhaustion. A cancer caregiver study showed the complex link between caregiver views, patient health, and caregiver well-being. Caregivers' health and ability assessments may differ from patients' self-reports, affecting caregiver burden.[29] Caregivers' impressions of patients' interpersonal and mental issues are linked to lower quality of life, depression, and anxiety.[30] Living with the patient and assessing their interpersonal and psychological issues affect caregiver health. Social support affects patient and caregiver health in a reciprocal manner.[31] Caregiver health affects patient care, emphasizing the importance of caregiver health in cancer care.[32] Cancer caregivers need targeted assistance and treatments to improve patient and caregiver outcomes. Information and support on the disease process boost caregivers' self-efficacy and health perceptions, according to research.[33] Psychoeducational components dominate caregiver education programs, but more comprehensive techniques to meet all caregiver requirements are needed.[34] Caregiver evaluations of patients' problems, especially interpersonal and psychiatric ones, greatly affect their quality of life and health.[30,35] Targeted support and information help caregivers understand and manage patients' social and psychological issues, improving caregiver health and the caregiver–patient relationship.

The Impact of Patient Demographic Variables on Caregiver Stress and Health Perception

The study indicated that age, gender, diagnosis, chronic condition, operation type, and stoma had no significant effect.

However, education level affected health perception, with lower education being associated with lower health awareness and self-efficacy. Complex catheters such as CVCs and drains increased effort and technical abilities, causing caregiver stress. The literature emphasizes that patient variables, especially perceived general health status, impact the care burden, depression, and anxiety of colorectal cancer caregivers.[36,37] This study found that although different characteristics of patients than those found in the literature affected caregivers, the health status and care-related activities of colorectal cancer surgery caregivers were affected by patient variables.

The Impact of Caregiver Demographic Variables on Caregiver Stress and Health Perception

The study found that education, marital status, employment status, and length of caregiving affected caregiver stress and perceived health, whereas age, gender, patient affiliation, chronic disease, and support did not. Lower education increases stress due to health management difficulties, whereas higher education improves problem-solving. Single caregivers may benefit from better social support and increased well-being through employment, financial stability, and social interaction. However, long-term caregiving increases stress and requires psychosocial support. As mentioned in the literature,[36] caregiver characteristics, time spent on caregiving, and expenses incurred were identified as contributing to caregiver burden.

Study Limitations

This study has limitations. Despite the acceptable power, the small sample size may have affected population representation. Self-reported measures may have introduced response bias into the study. Additionally, due to caregiver interaction, randomization was not performed, which may have influenced the results. Finally, follow-up was short, and the long-term effects of structured education on caregiver stress and health views were not examined. Future research should include diverse and larger populations, ensure randomization, and examine long-term outcomes to address these limitations.

Conclusion

This study found that structured education reduced stress and improved health perceptions in colorectal cancer caregivers. It was also found that patient characteristics, education level, and care equipment, as well as caregiver characteristics, education level, marital status, employment status, and duration of caregiving, affected caregiver stress and health perception. Colorectal cancer treatment is continuous and complex; therefore, caregiver education should be part of routine healthcare. Further research should examine the long-term effects of structured education programs and specific interventions for various caregiver groups. The chronic and diverse nature of colorectal cancer makes caregiving difficult. In addition to physical caregiving, these problems include mental stress from prognostic uncertainty, which affects caregivers. Caregiver well-being and caregiving ability depend on increasing their adaptability and coping resilience. Education and support programs should focus on techniques to increase caregiver resilience and help them cope with the challenges of caregiving. The effects of these interventions on caregiver mental health and support structures that improve their access to healthcare should be further studied. With resilience therapies, caregivers can manage stress, maintain emotional well-being, and successfully care for patients throughout the challenging process of colorectal cancer treatment.

Ethics

Ethics Committee Approval: Permission was obtained from the Dokuz Eylül University Non-interventional Research Ethics Committee (approval number: 2023/40-21, dated: 13.12.2023).

Informed Consent: Informed consent was obtained.

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Footnotes

Authorship Contributions

Concept: N.G.Ö.Ö., M.B., Ö.A., S.Ö., E.T., F.V., Design: N.G.Ö.Ö., Data Collection or Processing: N.G.Ö.Ö., M.B., Ö.A., S.Ö., E.T., Analysis or Interpretation: N.G.Ö.Ö., F.V., Literature Search: N.G.Ö.Ö., M.B., Ö.A., S.Ö., E.T., F.V., Writing: N.G.Ö.Ö., M.B., Ö.A., S.Ö., E.T., F.V.

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