THE EFFECTIVENESS OF NURSE-LED TELENAVIGATION PROGRAM FOR PATIENTS WITH COLORECTAL CANCER: A RANDOMISED CONTROLLED TRIAL

KOLOREKTAL KANSERLİ HASTALARDA HEMŞİRE LİDERLİĞİNDEKİ TELENAVİGASYON PROGRAMININ ETKİNLİĞİ: RANDOMİZE KONTROLLÜ BİR ÇALIŞMA

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ABSTRACT

Objective: Telenavigation is a new and innovative cancer follow-up method for oncology nurses. Since the COVID-19 pandemic, the need for telemedicine in oncology has grown, alongside the integration of patient navigation services into telemedicine. However, studies on this topic remain limited. This study aims to evaluate the effect of a nurse-led telenavigation program on symptom management and psychosocial adjustment in colorectal cancer (CRC) patients.

Method: This randomized controlled study included 60 CRC patients divided into navigated and non-navigated groups through random allocation at a cancer center in Istanbul. The navigated group received a Nurse-led Telenavigation Program (NTP) through three sessions on WhatsApp, focusing on symptom management and psychosocial adjustment. Data were analyzed using statistical methods.

Results: The study examining the effects of a nurse-led telenavigation program (NTP) on patients with colorectal cancer (CRC) found that both the intervention (navigated) and control (non-navigated) groups experienced significant reductions in the physical and psychological well-being subscales, as well as the total scores of the N-SAS (p<.05). However, no significant differences were observed between the two groups in terms of N-SAS subscales or total scores (p>.05). In contrast, the navigated group showed a significant decrease in total PAIS-SR scores over time (p<.05), whereas the non-navigated group showed no significant change (p>.05). These findings suggest that the NTP significantly improved psychosocial adjustment in CRC patients (p<.05), although it had limited effectiveness in alleviating physical symptoms (p>.05).

Conclusion: In consideration of the fact that nurse navigation programs are disability-focused interventions tailored to cancer patients, the present study provides valuable guidance for oncology nurses aiming to improve the psychosocial well-being of colorectal cancer patients. Consequently, it is recommended that the nurse-led telenavigation program be further evaluated through additional studies involving more diverse populations and larger sample sizes.

Key Words: Colorectal cancer, Patient navigation, Telemedicine

ÖZ

Amaç: Telenavigasyon, onkoloji hemşireleri için yeni ve yenilikçi bir kanser takip yöntemidir. COVID-19 salgınının ardından, teletıp hizmetleri onkolojide giderek artan bir gereksinim haline gelmiş ve hasta navigasyon hizmetlerininde dahil olduğu teletıp uygulamalarının bu alanda kullanımı artmıştır. Ancak bu konu üzerine çalışmalar literatürde halen sınırlıdır. Bu çalışma, hemşire liderliğindeki telenavigasyon programının kolorektal kanserli (KRK) hastalarda semptom yönetimi ve psikososyal uyum üzerindeki etkisini değerlendirmeyi amaçlamaktadır.

Yöntem: Bu randomize kontrollü çalışmada, İstanbul'daki bir kanser merkezine başvuran 60 kolorektal kanser hastası rastgele atama yöntemi kullanılarak navigasyon uygulanan ve navigasyon uygulanmayan olmak üzere iki gruba ayrıldı. Hemşire Liderliğindeki Telenavigasyon Programı (HLTP) kapsamında WhatsApp uygulaması aracılığıyla 3 seans görüşme yapıldı. Araştırma kapsamında semptom yönetimi ve psikososyal uyum ölçümleri değerlendirildi. Bulgular, istatistiksel yöntemler kullanılarak analiz edildi.

Bulgular Hemşire liderliğindeki telenavigasyon programının KRK'li hastalar üzerindeki etkisini araştıran çalışmada, müdahale (navigasyon uygulanan) ve kontrol (navigasyon uygulanmayan) gruplarının her ikisinde de N-SAS ölçeğinin fiziksel ve psikolojik iyilik hâli alt ölçekleri ile toplam puanlarında anlamlı düşüşler gözlemlendi (p<.05). Ancak gruplar arasında N-SAS alt ölçekleri ve toplam puanları açısından anlamlı bir fark bulunmadı (p>.05). Öte yandan navigasyon uygulanan grupta zamanla PAIS-SR toplam puanlarında anlamlı bir azalma görülürken (p<.05), navigasyon uygulanmayan grupta anlamlı bir değişiklik saptanmadı (p>.05). Bu bulgular, HLTP'nin KRK hastalarında psiko-sosyal uyumu anlamlı düzeyde artırdığını (p<.05), ancak fiziksel semptomların yönetimindeki etkilerinin yetersiz olduğunu göstermektedir (p>.05).

Sonuç: Hemşire liderliğinde telenavigasyon programlarının kanser hastalarına göre uyarlanmış engellilik odaklı müdahaleler olduğu gerçeği göz önünde bulundurulduğunda, mevcut çalışma kolorektal kanser hastalarının psikososyal refahını iyileştirmeyi amaçlayan onkoloji hemşireleri için değerli bir rehberlik sağlamaktadır. Bu çalışmanın sonucunda, hemşire liderliğindeki telenavigasyon programının daha çeşitli popülasyonları ve daha büyük örneklem gruplarını içeren ek çalışmalar yoluyla değerlendirilmesi önerilmektedir.

Anahtar Kelimeler: Kolorektal kanser, Hasta navigasyonu, Teletıp

INTRODUCTION

Colorectal cancer (CRC) affects approximately 1.9 million individuals annually, making it the third most prevalent cancer and the second leading cause of cancer-related mortality worldwide [1,2]. The CRC diagnosis imposes a substantial physiological and psychological burden, often disrupting social aspects of life, including interpersonal relationships and responsibilities. Psychosocial adjustment in cancer patients reflects their ability to adapt to these disease-related changes, where inadequate symptom management or poor psychosocial adjustment can negatively influence disease progression and treatment response [3-6]. CRC patients, particularly those with advanced disease, frequently experience symptoms such as pain, fatigue, nausea, vomiting, constipation, diarrhea, weight loss, rectal bleeding, anorexia, and delirium [7]. Alongside physical symptoms, they often endure psychosocial challenges, including adjustment issues, depression, anxiety, reduced quality of life, and diminished self-confidence [5,8]. Interventions aimed at symptom management and psychosocial adjustment include individual and group-based education, psychoeducation, therapeutic support, and navigation programs, provided either face-to-face or via telehealth technologies [9-13].

The COVID-19 pandemic accelerated telehealth adoption for oncology patients, leading to increased research in this field. Telehealth applications developed for oncology aim to improve access to care, service outcomes, and continuity while minimizing hospital visits [14-16]. Telemedicine in oncology has demonstrated benefits for timely diagnosis, cost reduction, patient comfort, and improved access to treatment [17,18].

Oncology navigation, first developed in the USA in the early 1990s [19,20], aims to reduce barriers to cancer care, especially for socioeconomically disadvantaged groups. Navigation services help remove financial, emotional, scheduling, communication, and healthcare access obstacles, ensuring timely cancer screening, diagnosis, treatment, and post-treatment follow-up [21-23]. Recently, navigation has expanded into telehealth, giving rise to telenavigation, which provides patient and family education led by trained navigators. Telenavigation enhances care quality, supports therapeutic communication, assists in end-of-life care, addresses financial issues, and reduces healthcare access barriers. Oncology nurse navigators, using telecommunication, offer continuous patient support, improving healthcare access, patient satisfaction, and care quality [16-18,24]. While telenavigation is known to support physical and psychological symptom management and patient satisfaction, its full impact remains under-researched [13,25-28]. Telehealth remains uncommon in Turkish oncology care and often depends on individual efforts. Further studies are necessary to explore telehealth's applicability across all levels of oncology care in developing countries like Turkiye.

In this context, the present study aims to assess the impact of a nurse-led telenavigation (NTP) program on symptom management and psychosocial adjustment in CRC patients.

METHOD

Study Design and Participants

This research was conducted from July 2021 to February 2022 at a hospital in Istanbul, using a pretest-posttest control group design within the outpatient chemotherapy unit of the medical oncology clinic. The chemotherapy unit is equipped with four fully automated robotic chemotherapy preparation units, 85 chemotherapy administration chairs, and a patient education room. Before their first chemotherapy session, all patients receive a 15-minute education session from an educational nurse, covering side effect management, dietary recommendations and emergency hospitalization guidelines. Each patient also receives an information booklet summarising the content of the session.

The study population comprised an annual average of 608 outpatients with CRC attending the clinic. A power analysis using G*Power 3.1

determined that a sample size of 28 participants per group (56 total) would provide 80% power with a 5% margin of error and an effect size of 0.767 (df=54; t=2.004). Accounting for a 10% attrition rate, a target of 62 participants was set. During the study, 118 CRC patients were screened; 34 were excluded for not meeting inclusion criteria. Ultimately, 62 patients who met eligibility criteria and consented were enrolled, with 30 assigned to the experimental (navigated) group and 30 to the control group. One participant from each group was excluded due to non-responsiveness during follow-up, resulting in a final sample size of 60 participants Participants were randomly assigned based on registration order at the chemotherapy unit. The study adhered to the CONSORT (Consolidated Standards of Reporting Trials) guidelines [29], with a CONSORT flowchart provided in Figure 1. Eligibility criteria for participants included the following:

- Aged 18 years or older
- Diagnosed with CRC
- Independent WhatsApp use (or assisted by a relative)
- No cognitive impairments
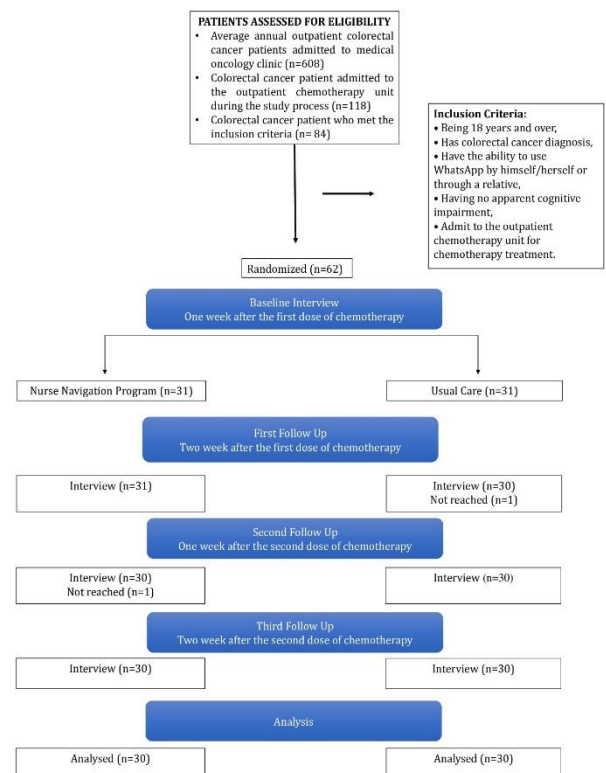- Undergoing chemotherapy at the outpatient chemotherapy unit.

Figure 1. CONSORT flowchart

Intervention

Nurse-led Telenavigation Program (NTP)

The NTP consisted of tailored interventions, including colorectal cancer education, psycho-oncological support, and a nurse-managed telephone helpline. Personalized CRC education and psycho-oncological counseling were delivered through WhatsApp video calls, with sessions lasting 45-60 minutes each, while the nurse-led telephone support was conducted via voice calls. Intervention components of the NTP are illustrated in Figure 2.

Outcome Measures

Data were collected using three tools: the Descriptive Characteristics Information Form, the Nightingale Symptom Assessment Scale (N-SAS), and the Psychosocial Adjustment to Illness-Self-Report Scale

(PAIS-SR). Data collection was conducted via Google Forms to minimize patients' risk of COVID-19 exposure.

Descriptive Characteristics Information Form: This form, structured based on relevant literature [23,27,30,31], was divided into three sections to capture socio-demographic characteristics and CRC diagnosis details.

Nightingale Symptom Assessment Scale (N-SAS): Developed in Turkish by Can and Aydiner in 2009, the N-SAS assesses cancer-related symptom intensity, providing a reliable measure of physical, social, and psychological well-being (Cronbach's alpha = .93). Scores on the 38-item scale reflect overall quality of life and well-being, with lower scores indicating fewer disease or treatment-related issues [32]. The N-SAS showed a reliability score of .834 in this study.

Psychosocial Adjustment To Illness Scale-Self Report (PAIS-SR): Originally created in English by Derogatis in 1986, the PAIS-SR evaluates psychosocial adaptation to physical illness, scored across seven subcategories with a total of 46 items. Scores below 35 indicate good psychosocial adjustment, scores between 35 and 51 reflect moderate adjustment, and scores above 51 indicate poor adjustment. The PAIS-SR demonstrated a reliability score of .881 in this study [33].
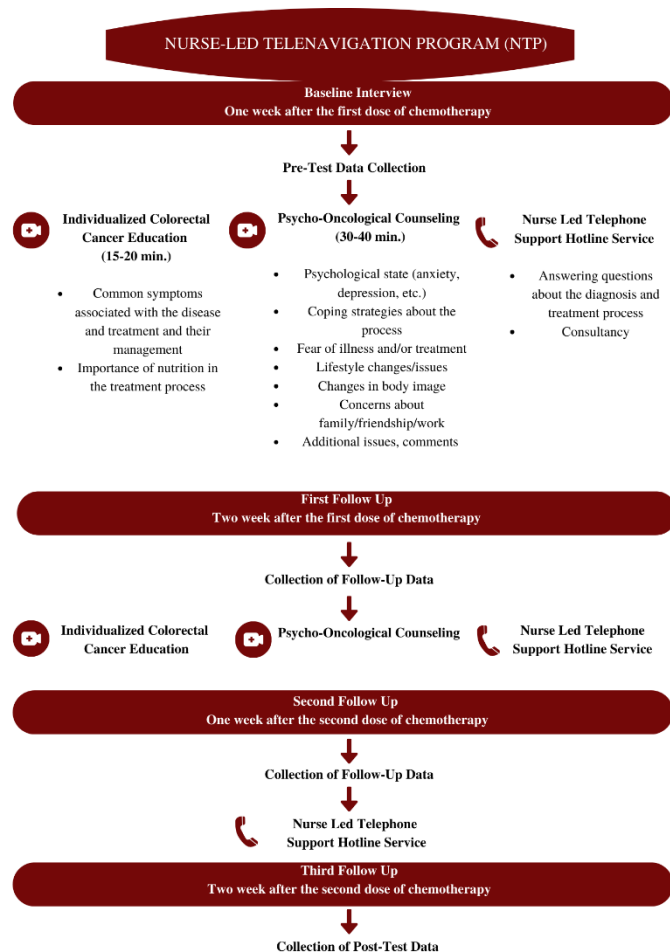

Figure 2. Nurse-led telenavigation program

Ethical Approval

This study was approved by the University of Health Sciences Hamidiye Clinical Research Ethics Committee (date: 04.05.2021, approval number: 32378), in accordance with the Declaration of Helsinki. Informed consent was obtained from all participants. Further study details are available at ClinicalTrials.gov (identifier: NCT05571098).

Statistical Analysis

Data analysis was performed using IBM SPSS version 22. Descriptive measures (count, percentage, mean, and standard deviation) were calculated. Normality was assessed through kurtosis and skewness values. The chi-square and Fisher's exact tests were used to analyze categorical differences between groups, while independent t-tests compared continuous data between groups. Repeated measures ANOVA and the Bonferroni test were applied for within-group changes. A p-value of <0.05 was considered statistically significant.

RESULTS

The study included 60 participants, with 30 in the nurse-navigated group and 30 in the non-navigated group. The average age of participants was 60.13 years (SD=10), and the majority were male (78.33%), married (86.7%), had either elementary or secondary education (73.3%), perceived their income level as good (68.3%), and were not actively employed (90%). Most participants were diagnosed with non-metastatic cancer (58.3%), had undergone surgery (73.3%), and had not received radiotherapy (81.7%) (Table 1).

Table 1. Baseline demographic and health-related characteristics of participants by study group (n=60)

Variables	Nurse Navigated	Non-Navigated	Total	Statistics
Age, Mean±SD	62.27±9.08	58 ±10.56	60.13±10	p=0.099
Sex (%)				
Female	23.3	20	21.7	
Male	76.7	80	78.3	p=0.754
Marital status (%)				
Married	86.7	86.7	86.7	
Single/				
Widowed/	13.3	13.3	13.3	p=0.647
Divorced				
Education (%)				
Elementary and secondary school	76.7	70	73.3	
High school and university	23.3	30	26.7	p=0.559
Income (%)				
Poor	30	33.3	31.7	
Good	70	66.7	68.3	p=0.781
Employment status (%)				
Employed	6.7	13.3	10	
Unemployed	93.3	86.7	90	p=0.389
Diagnosis (%)				
Metastatic	50	33.3	41.7	
Non-Metastatic	50	66.7	58.3	p=0.19
Surgical treatment (%)				
Yes	70	76.7	73.3	
No	30	23.3	26.7	p=0.386
Radiotherapy (%)				
Yes	20	16.7	18.3	
No	80	83.3	81.7	p=0.5

p<.05 was considered significant

Both the navigated and non-navigated groups showed significant reductions in physical and psychological well-being sub-dimensions and total scale scores (p<.05) at baseline and after the first, second, and third follow-ups. However, there were no significant differences between the groups in N-SAS sub-dimensions and total scores (p>.05) (Table 2).

Table 2. Nightingale Symptom Assessment Scale measure baseline score and after NTP (n=60)

Nightingale Symptom Assessment Scale		Nurse Navigated	Non-Navigated	Statistics
Psychological Well-Being (Mean±SD)	Baseline	0.936±0.585	0.713±0.675	p^a=0.177
	First follow up	0.583±0.458	0.440±0.451	p^a= 0.227
	Second follow up	0.947±0.589	0.790±0.640	p^a=0.328
	Third follow up	0.573±0.446	0.533±0.505	p^a=0.746
	F/p^b	21.713/0.000	11.227/0.000	
	Bonferroni	1>2,4	1>2; 3>2,4	
Physical Well-Being (Mean±SD)	Baseline	0.767±0.368	0.713±0.431	p^a=0.608
	First follow up	0.227±0.237	0.203±0.198	p^a=0.681
	Second follow up	0.732±0.346	0.763±0.359	p^a=0.729
	Third follow up	0.275±0.243	0.300±0.323	p^a=0.736
	F/p^b	83.685/0.000	37.803/0.000	
	Bonferroni	1,3>2,4	1,3>2,4	
Social Well-Being (Mean±SD)	Baseline	0.158±0.188	0.129±0.184	p^a=0.547
	First follow up	0.121±0.159	0.113±0.195	p^a=0.857
	Second follow up	0.213±0.239	0.221±0.287	p^a=0.903
	Third follow up	0.167±0.206	0.179±0.291	p^a=0.848
	F/p^b	3.893/0.032	2.539/0.110	
	Bonferroni	3>2	-	
Total Score (Mean±SD)	Baseline	0.620±0.329	0.519±0.357	p^a=0.256
	First follow up	0.310±0.251	0.25±0.212	p^a=0.335
	Second follow up	0.630±0.332	0.591±0.331	p^a=0.651
	Third follow up	0.338±0.255	0.338±0.290	p^a=0.991
	F/p^b	54.637/**0.000**	23.111/**0.000**	
	Bonferroni	1,3>2,4	1>2; 3>2,4	

a:Independent Groups t-test; b:Repeated Measures Anova Test; Baseline:One week after the first dose of chemotherapy; First follow up:Two week after the first dose of chemotherapy; Second follow up:One week after the second dose of chemotherapy; Third follow up:Two week after the second dose of chemotherapy

Psychosocial adjustment levels were measured with PAIS-SR in both groups. In the non-navigated group, no significant differences were observed in healthcare orientation, vocational environment, or total scores at the first, second, or third follow-ups compared to baseline. However, the navigated group showed a significant reduction (p<.05) (Table 3).

Significant differences were noted between the groups in healthcare orientation, sexual relationships, and extended family relationships (p<.05). Specifically, the navigated group had decreased healthcare orientation scores by the second follow-up and decreased scores in both healthcare orientation and extended family relationships by the third follow-up compared to the non-navigated group. Conversely, sexual relationship scores were lower in the non-navigated group than in the navigated group during the first follow-up. Overall, PAIS-SR total scores in the navigated group showed significant reductions over time (p<.05), while the non-navigated group showed no significant change (Table 3).

Table 3. Psychosocial Adjustment to Illness Scale-Self Report measure baseline score and after NTP (n=60)

Psychosocial Adjustment to Illness Scale		Nurse Navigated	Non-Navigated	P
Healthcare Orientation	Baseline	3.200±2.905	3.967±3.557	0.364
	First follow up	2.467±2.649	3.900±3.566	0.082
	Second follow up	2.133±2.113	4.100±3.294	**0.008**
	Third follow up	2.067±2.149	4.133±3.298	**0.006**
	F/p	12.515/**0.000**	0.693 /0.444	
	Bonferroni	**1>2,3,4**		
Vocational Environment	Baseline	6.200±3.326	6.267±2.828	0.934
	First follow up	5.933±3.473	6.367±2.810	0.597
	Second follow up	5.633±3.327	6.667±2.644	0.188
	Third follow up	5.633±3.316	6.633±2.593	0.198
	F/p	5.924 /**0.007**	1.327 /0.264	
	Bonferroni	**1>3**		
Domestic Environment	Baseline	2.033±2.173	2.067±1.982	0.951
	First follow up	2.000±2.150	2.067±1.982	0.901
	Second follow up	1.867±1.995	2.200±1.864	0.506
	Third follow up	1.867±1.995	2.200±1.864	0.506
	F/p	1.663/0.208	1.000 /0.326	
Sexual Relationships	Baseline	0.620±0.329	0.519±0.357	p^a=0.256
	First follow up	0.310±0.251	0.25±0.212	p^a=0.335
	Second follow up	0.630±0.332	0.591±0.331	p^a=0.651
	Third follow up	0.338±0.255	0.338±0.290	p^a=0.991
	F/p	54.637/**0.000**	23.111/**0.000**	
Extended Family Relationships	Baseline	0.667±0.922	0.900±1.296	0.425
	First follow up	0.433±0.728	0.867±1.279	0.114
	Second follow up	0.467±0.730	0.967±1.245	0.063
	Third follow up	0.400±0.621	1.067±1.285	**0.014**
	F/p	3.418/0.058	2.071 /0.147	

Social Environment	Baseline	4.833±3.668	4.267±4.177	0.579
	First follow up	4.600±3.276	4.167±3.975	0.647
	Second follow up	4.667±3.122	4.700±4.061	0.972
	Third follow up	4.633±3.000	4.800±4.106	0.858
	F/p	0.415 /0.665	1.868 /0.182	
Psychological Distress	Baseline	2.633±2.312	2.067±2.420	0.358
	First follow up	2.100±2.234	1.933±2.545	0.788
	Second follow up	2.467±2.270	2.533±2.649	0.917
	Third follow up	2.133±2.097	2.300±2.521	0.782
	F/p	3.67/0.065	2.853 /0.070	
PAIS-SR Total	Baseline	25.333±12.680	22.900±14.399	0.490
	First follow up	23.267±12.709	22.433±14.268	0.812
	Second follow up	23.067±12.140	24.700±14.303	0.635
	Third follow up	22.300±12.524	24.433±14.080	0.538
	F/p	5.277/**0.014**	2.259 /0.139	
	Bonferroni	**1>2,3,4**		

Baseline:One week after the first dose of chemotherapy; First follow up:Two week after the first dose of chemotherapy; Second follow up: One week after the second dose of chemotherapy; Third follow up:Two week after the second dose of chemotherapy

DISCUSSION

This study aimed to evaluate the impact of the Nurse-led Telenavigation Program on symptom management and psychosocial adjustment in patients with colorectal cancer. The findings revealed that while the program had significant effects on psychosocial adjustment, it did not have a statistically significant impact on symptom management. The Nurse-led Telenavigation Program in this study included individualized colorectal cancer education, psycho-oncological counseling, and a nurse-led telephone support hotline, all delivered via the WhatsApp application. Following the intervention, reductions in the physical and psychological well-being sub-dimensions, as well as total scale scores, were observed in both the navigated and non-navigated groups. However, no significant differences were found between the two groups.

This result may be expected, as patients' symptom burden is typically high in the first weeks after chemotherapy, and symptom management often improves in the subsequent weeks. It is likely that patients can manage the common symptoms of colorectal cancer without the need for nurse navigation, which may explain the lack of significant difference between the experimental and control groups.

A review of studies on improving symptom management shows both supportive and differing results. For example, a study by Mooney et al. (2014) asked patients to report the occurrence and severity of symptoms developed during chemotherapy to oncology physicians and nurses via a computer-based telephone monitoring system. The researchers found no significant change in symptom severity between the control and experimental groups [34]. Similarly, in a study by Traeger et al., the impact of a nurse-led symptom management intervention for patients with non-metastatic cancer (including colorectal, breast, and lung cancers) undergoing chemotherapy was evaluated. The study found no significant differences between the groups in any of the symptoms (p>.05) [35].

However, contrasting results were reported in a study by Mooney et al., which developed a tele-reporting system for monitoring and managing symptoms during chemotherapy. Patients were asked to report their symptoms daily, and if the symptoms exceeded pre-determined thresholds, they received intervention via a nurse-managed support line. This study found a significant decrease in the occurrence and intensity of symptoms (excluding diarrhea) in the experimental group after the intervention compared to the control group (p<.05) [27]. Additionally, a study by Lai et al. assessed a nurse-led care program for patients with breast cancer undergoing chemotherapy. The program significantly reduced the occurrence of oral mucositis, fatigue, peripheral neuropathy, and distress in the intervention group compared to the control group [26].

The results of the current study also indicated that the navigated group exhibited lower psychosocial adjustment levels compared to the non-navigated group following the intervention. Many studies have shown that telehealth interventions positively influence psychosocial adjustment. For instance, Loiselle et al. examined the effect of an eight-week computer-based multimedia information intervention on the psychosocial adjustment of individuals newly diagnosed with breast or prostate cancer. The study found that the intervention group showed a more significant increase in cancer knowledge and maintained a higher level of functional quality of life, with improved satisfaction in supportive care (p<.05). However, the intervention did not demonstrate an impact on self-esteem, self-management, or optimistic thinking (p>.05) [36].

Lichiello et al. studied young adult cancer survivors and assessed the impact of a psychosocial telehealth intervention. The post-intervention results showed greater acceptance of their condition, psychological relief, and reductions in anxiety and feelings of hopelessness (p<.05) [37]. A systematic review of telephone interventions for symptom management in adult cancer patients found that these interventions reduced depression, anxiety, and emotional distress [12]. Furthermore, a meta-analysis investigating the effects of telehealth interventions on breast cancer patients' quality of life and psychological well-being found improvements in both quality of life and self-efficacy, with reductions in depression and perceived stress (p<.05). However, no significant difference was found between groups regarding anxiety levels (p>.05) [38].

Nurse counseling plays a crucial role in the psychosocial adjustment of cancer patients, particularly in advising them about potential challenges post-treatment. Nurse navigators are essential at this stage, and counseling provided through tele-navigation programs is expected to improve psychosocial adjustment in patients.

Limitations

While the study yielded significant findings, several limitations should be considered when interpreting the results. First, the research was conducted at a single center, which limits the generalizability of the findings to a broader population of cancer patients. Additionally, the sample group discussed in the study may not represent all colorectal cancer patients, potentially affecting the applicability of the results. Furthermore, since the Nurse-led Telenavigation Program (NTP) was delivered using telehealth methods, the findings may not be applicable to individuals who are unfamiliar with or do not have access to telehealth services.

CONCLUSION

This study employed the Nurse-led Telenavigation Program (NTP) to explore the experiences of colorectal cancer patients, yielding important insights into symptom management and psychosocial adjustment. The results indicate that the NTP was effective in enhancing patients' psychosocial adjustment, though it did not significantly improve symptom management. Given that nurse navigation programs are disability-focused interventions tailored to cancer patients, this study provides valuable guidance for oncology

nurses aiming to improve the psychosocial well-being of colorectal cancer patients.

To strengthen future research in this field, it is recommended that NTP be evaluated with larger, more diverse sample groups that include a variety of cancer types. Expanding the program's content and scope, while ensuring its continuity through digital tools (such as applications), would further enhance its effectiveness. Including caregivers in the program is essential for providing holistic care, and integrating NTP into routine patient care by oncology nurses in outpatient chemotherapy units could increase its accessibility across different treatment settings.

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