

RESEARCH ARTICLE (ORIGINAL)

Effectiveness of a Nurse-Led Care Transition Strategy After Colorectal Cancer Surgery: Pragmatic Trial

Eficácia de uma Estratégia de Transição do Cuidado Liderada por Enfermeiros no Pós-Operatório de Câncer Colorretal: Ensaio Pragmático

Eficacia de Una Estrategia de Transición Asistencial Dirigida por Enfermeros tras una Intervención Quirúrgica por Cáncer Colorrectal: Ensayo Pragmático

Ana Letícia Missio de Oliveira ¹

 <https://orcid.org/0000-0001-8843-4126>

Elisiane Lorenzini ²

 <https://orcid.org/0000-0001-8426-2080>

Márcia Baiocchi Amaral Danielle ¹

 <https://orcid.org/0000-0001-6207-7722>

Wilson Canón-Montañez ³

 <https://orcid.org/0000-0003-0729-5342>

Letícia Flores Trindade ¹

 <https://orcid.org/0000-0001-9088-2825>

Adriane Cristina Bernat Kolankiewicz ¹

 <https://orcid.org/0000-0003-1793-7783>

¹ Regional University of the Northwest of the State of Rio Grande do Sul (UNIJUÍ), Ijuí, RS, Brazil

² Federal University of Santa Catarina (UFSC), Florianópolis, SC, Brazil

³ University of Antioquia, Faculty of Nursing, Medellín, Antioquia, Colombia

Corresponding author

Adriane Cristina Bernat Kolankiewicz

E-mail: adri.saudecoletiva@gmail.com

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Abstract

Background: Despite available evidence on care transition, significant gaps persist in practice and public policies.

Objective: To evaluate the effectiveness of a nurse-led care transition strategy for patients with colorectal cancer, aiming to improve care transition, quality of life, and reduce hospital length of stay, readmissions, and emergency service use.

Methodology: Randomized clinical trial involving patients aged 45 to 85 years. Those without access to landline or mobile phones were excluded.

Results: Care transition was considered satisfactory. The intervention showed positive effects on quality of life, particularly in the domains of social functioning, fatigue, dyspnea, and insomnia. However, no statistical differences were observed regarding hospital length of stay, readmissions, or emergency service use.

Conclusion: As a pilot study, benefits were identified in specific aspects, although no differences were found in some relevant clinical outcomes.

Keywords: transitional care; continuity of patient care; nursing; randomized controlled trial; colorectal neoplasms

Resumo

Enquadramento: Apesar das evidências disponíveis sobre a transição do cuidado, ainda existem lacunas significativas na prática e nas políticas públicas.

Objetivo: Avaliar a eficácia de uma estratégia liderada por enfermeiros para melhorar a transição do cuidado e a qualidade de vida em doentes com cancro colorretal, bem como reduzir o tempo de internamento hospitalar, as readmissões e a procura por serviços de urgência.

Metodologia: Ensaio clínico aleatorizado com doentes com idades entre os 45 e os 85 anos, excluindo-se os que não tivessem acesso a telefone fixo ou móvel.

Resultados: A transição do cuidado foi considerada satisfatória. A intervenção demonstrou ter efeitos positivos na qualidade de vida, especialmente nos domínios funcionamento social, fadiga, dispneia e insónia. No entanto, não foram observadas diferenças estatísticas em relação ao tempo de permanência hospitalar, às readmissões e à procura por serviços de urgência.

Conclusão: Como estudo piloto, identificaram-se benefícios em aspetos específicos, embora não tenham sido observadas diferenças em alguns resultados de saúde relevantes.

Palavras-chave: cuidado transicional; continuidade da assistência ao paciente; enfermagem; ensaio clínico controlado aleatório; neoplasias colorretais

Resumen

Marco contextual: A pesar de la evidencia disponible sobre la transición asistencial, persisten importantes lagunas en la práctica y en las políticas públicas.

Objetivo: Evaluar la eficacia de una estrategia de transición asistencial dirigida por enfermeros para pacientes con cáncer colorrectal, con el objetivo de mejorar la transición asistencial y la calidad de vida, y reducir la duración de la estancia hospitalaria, los reingresos y el uso de los servicios de urgencias.

Metodología: Ensayo clínico aleatorizado en el que participaron pacientes de entre 45 y 85 años. Se excluyó a aquellos que no tenían acceso a teléfonos fijos o móviles.

Resultados: La transición asistencial se consideró satisfactoria. La intervención mostró efectos positivos en la calidad de vida, especialmente en los ámbitos del desempeño social, la fatiga, la disnea y el insomnio. Sin embargo, no se observaron diferencias estadísticas en cuanto a la duración de la estancia hospitalaria, los reingresos o el uso de los servicios de urgencias.

Conclusión: Como estudio piloto, se identificaron beneficios en aspectos específicos, aunque no se encontraron diferencias en determinados resultados clínicos relevantes.

Palabras clave: atención transitoria; continuidad de la atención al paciente; enfermería; ensayo controlado aleatorio; neoplasias colorrectales



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Introduction

Cancer is among the leading causes of death in 112 countries, with colorectal cancer (CRC) ranking third in terms of incidence and second in terms of mortality (Bray et al., 2024). Its treatment is complex, prolonged, and requires continuous care from a multidisciplinary team, significantly impacting the lives of patients and their families (Griffin et al., 2024).

Care transition (CT) refers to the safe and timely transfer of patients across different levels of care, from admission to post-discharge follow-up (Rezaei et al., 2025). Communication between services, through documentation or telephone contact, combined with health education provided to patients and families, has been shown to reduce hospital readmissions and the demand for emergency services (Acosta et al., 2020).

The hospital-to-home transition requires the involvement of all healthcare professionals, with nurses playing a central role in identifying patients' difficulties during discharge (Griffin et al., 2024). A study conducted with patients diagnosed with digestive tract neoplasms in southern Brazil found CT to be satisfactory; however, weaknesses in the care plan were noted, attributed to educational gaps, lack of protocols, and insufficient continuity in Primary Health Care (PHC) (Rodrigues et al., 2022). Data on CT effectiveness specifically for patients with CRC is still lacking.

International literature highlights that transitional care (TC) interventions are associated with significant improvements in health outcomes for oncology patients. A systematic review demonstrated that nurse-led transitional care reduces hospital readmissions, optimizes recovery, and improves quality of life among patients with CRC (Trindade et al., 2022). Similarly, a meta-analysis of multidisciplinary interventions confirmed benefits in continuity of care and reductions in healthcare utilization, reinforcing the importance of structured strategies for complex patient populations (Collet et al., 2025). These findings support the relevance of investigating nurse-led transitional care specifically for patients with CRC, a population at high risk for complications and treatment-related burden.

As clinical trial results may take up to 20 years to be implemented in clinical practice, healthcare professionals may help generate research questions based on real-world demands. Evidence also shows that patient safety perception improves when staff commit to implementing new practices (Van Grootel et al., 2025).

A systematic review conducted among patients with CRC found that post-discharge surveillance programs reduced hospital readmissions by 32%, while standardized enhanced recovery protocols decreased hospitalization time by up to 1.5 days (Trindade et al., 2022). This study aims to evaluate the effectiveness of a nurse-led CT strategy for patients with CRC, with the goal of improving CTs and quality of life, as well as reducing hospital length of stay, readmissions, and emergency service utilization.

Background

In Brazil, the lack of a national policy on TC limits the exploration of this topic. Understanding TC-related variables and their relationship with oncology patient characteristics is essential for developing effective strategies to ensure continuity of care (Van Grootel et al., 2025; Rodrigues et al., 2022). International evidence indicates that TC interventions can reduce hospital readmissions and emergency service use while improving patient-reported outcomes and quality of life (Rezaei et al., 2025; Trindade et al., 2022). Qualitative studies also highlight patients' and caregivers' positive perceptions regarding safety, support, and satisfaction during hospital-to-home transitions (Xu et al., 2024; Griffin et al., 2024). Overall, TC strategies have been shown to improve patient safety and reduce healthcare costs, emphasizing their relevance in the Brazilian context (Ghenot et al., 2024; Van Grootel et al., 2025). Implementing TC interventions during hospitalization, at discharge, and post-discharge is therefore critical, particularly given the gaps in their practical application within Brazilian healthcare services.

Research question/hypothesis

What is the effectiveness of a nurse-led care transition strategy for patients with colorectal cancer in relation to improving care transition and quality of life, as well as reducing hospital length of stay, hospital readmissions, and emergency service use?

A nurse-led care transition strategy for patients with colorectal cancer improves care transition, enhances quality of life, and reduces hospital length of stay, hospital readmissions, and emergency service use.

Methodology

Study design

This is a pragmatic, double-blind randomized controlled trial (RCT) conducted in accordance with the CONSORT 2010 and SPIRIT guidelines (Schulz et al., 2010; Chan et al., 2013). It was developed in a surgical inpatient unit of a hospital in southern Brazil. The implementation trial protocol was developed based on scientific evidence with the participation of knowledge users (Rodrigues et al., 2022; Trindade et al., 2022). The study is registered with the Brazilian Registry of Clinical Trials under the identifier "RBR-44vznyc Nurse-led strategy to improve the Care Transition in patients undergoing colorectal cancer surgery".

Participants

Hospitalized patients with a diagnosis of CRC who underwent surgery were eligible. Inclusion criteria: preserved cognitive activity assessed by nurses. Exclusion criteria: not having access to a fixed or mobile telephone line.

Sample calculation

A minimum sample size of 118 patients ($n = 59$ per group) was calculated based on the following parameters: significance level of 5%, statistical power of 90%, expected hospital readmission rate of 10% in the Intervention Group (IG) and 40% in the Control Group (CG), an intervention-to-control group ratio of 1:1, and a 20% adjustment for possible losses and refusals. This manuscript presents the results of the pilot phase of the study.

Randomization

Randomization was performed by an external researcher

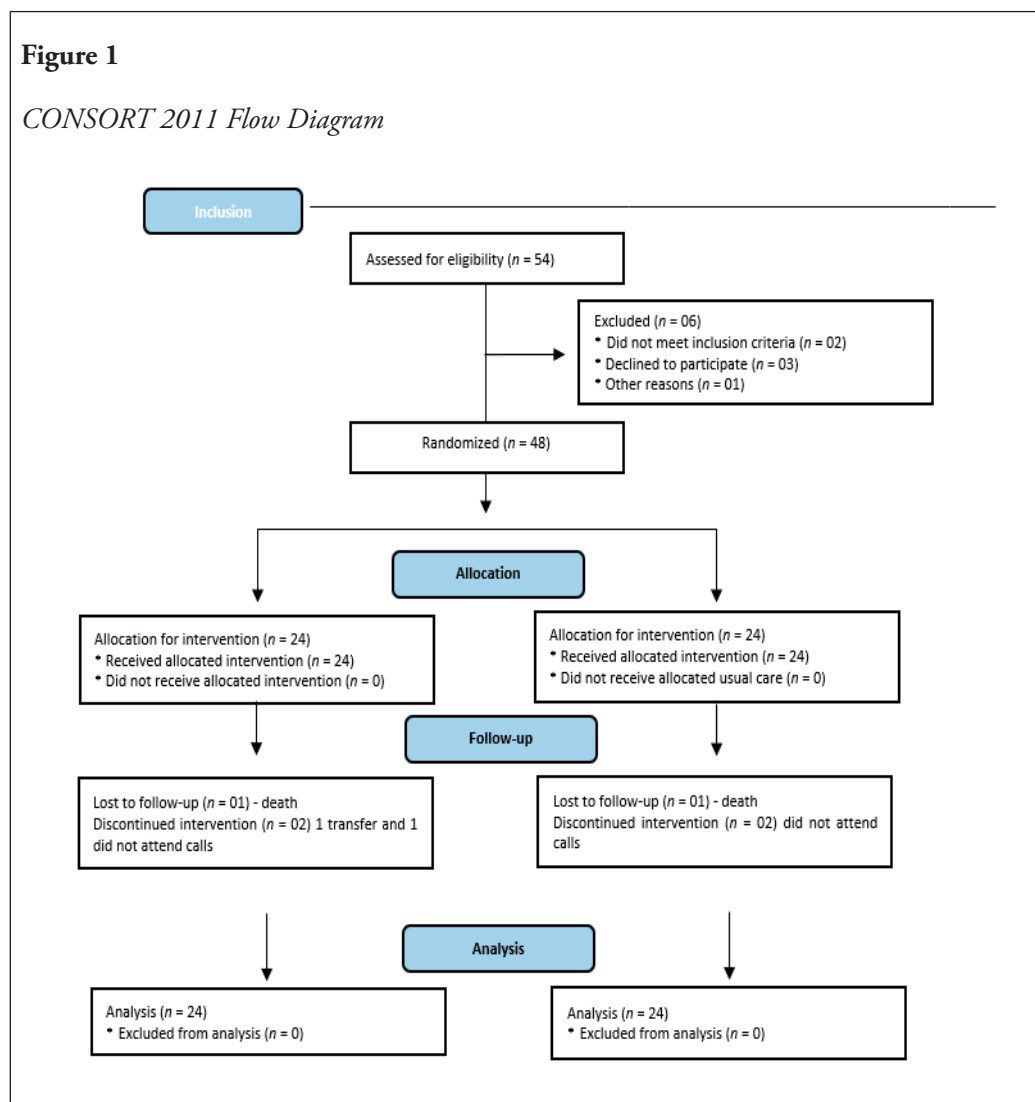
at the intervention site using the online platform <http://www.randomizer.org>, with 1:1 block randomization.

Data collection

Patients were invited to participate during hospitalization and, after acceptance, answered a questionnaire including sociodemographic variables and the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire – Core 30 (EORTC QLQ-C30). Clinical data were collected from medical records. They were recruited between January and December 2021 and randomly allocated to CG and IG.

Figure 1

CONSORT 2011 Flow Diagram



Intervention

IG: On the first day of admission to the surgical unit: A local context nurse, previously trained for the intervention, accompanied by a final-year undergraduate nursing student, identified the family member/caregiver who would accompany the patient at home, discussed the patient's and family's objectives for the hospitalization, provided information about the stages and needs related to discharge, and discussed the discharge plan with the physician and the patient.

After surgery: A discharge preparation meeting was

conducted by the local context nurse and a final-year undergraduate nursing student. During this meeting, the nurse identified needs and concerns about returning home, advised the patient and family about the patient's clinical condition, and explained wound care, medication use, and catheter management (if applicable), using the Teach-Back technique. This technique was applied to verify understanding by asking the patient to repeat, in their own words, the information received, thereby confirming comprehension of the discharge instructions. On the day of discharge or the first working day following

discharge: The local context nurse, accompanied by a final-year undergraduate nursing student, contacted the patient's PHC reference unit by telephone to communicate the case and the patient's main needs to the nurse. The nurse reviewed the reconciled medication list with the patient and family and provided them with a multidisciplinary hospital discharge summary/plan, including data on clinical follow-up, diagnostic tests performed, diagnosis, prescribed medications, long-term medications, length of hospitalization, brief summary of hospitalization, and guidance for continuity of care in PHC. The nurse also informed the patient and the family of the name and telephone number of the PHC nurse responsible for follow-up, as well as the unit's working hours should any problems arise after discharge.

The intervention is based on the Agency for Healthcare Research and Quality (AHRQ) strategy "Care Transitions From Hospital to Home: IDEAL Discharge Planning", which presents key issues for patient and family engagement in preparing for hospital discharge (AHRQ, 2013). This process incorporates elements from admission to discharge and includes at least one meeting between the patient, the family, and the nurse or physician responsible for discharge planning, specifically to address doubts and concerns.

Usual care: The control group received the hospital's standard discharge process, which consists of general guidelines and the delivery of information on stoma care, if applicable.

Data were collected by a team of nurses, including the main researcher, who conducted bedside data collection; one nurse responsible for the randomization process; and two hospital nurses who implemented the intervention strategy.

Three meetings were held to train the nurses responsible for the intervention. During the first meeting, the procedures and timing of the intervention, as well as the *Teach-Back* technique, were explained. The second meeting focused on addressing their doubts and difficulties. The third meeting took place already in the course of the intervention to check if it was being carried out as planned.

After evaluating the eligibility criteria and obtaining patient consent, sociodemographic and clinical data were collected, and the EORTC QLQ-C30 was administered at the bedside. This multidimensional instrument, developed by the EORTC (2001; Wintner et al. 2016),

assesses patients' QoL across five functional scales, three symptoms scales, and one global health status/QoL scale. This instrument was reapplied 90 days after hospital discharge to verify the QoL scores after the patient's return to family and community life.

Participants were informed that a telephone follow-up would be conducted between 7 and 30 days after hospital discharge to apply the Care Transitions Measure-15 (CTM-15; Coleman et al., 2005), which has been validated for use in Brazil (Acosta et al., 2017). The CTM-15 is divided into 15 questions and has four factors: Factor 1, Health management preparation; Factor 2, Medication understanding; Factor 3, Important preferences; and factor 4, Care plan. To calculate mean scores, a formula was applied that transforms the averages obtained into scores from 0 to 100 (Coleman et al., 2005). Higher scores indicate better quality of CT. Although there is no cutoff point, the authors consider a score equal to or greater than 70 satisfactory (Acosta et al., 2020).

The follow-up calls were made by scientific initiation fellows in a private environment of a university in southern Brazil. Patients' medical records were consulted after hospital discharge to identify the occurrence of emergency department visits or hospital readmissions.

Statistical analysis

The mean scores of the CTM-15 and EORTC QLQ-C30 were analyzed considering the significant value of $p < 0.05$. The comparison of variables between the groups was performed using one-way analysis of variance (ANOVA) with Tukey or Scheffé post hoc tests. Generalized estimating equations (GEE; Bonferroni post hoc) models were used to evaluate the differences.

The study complied with Resolution No. 466/2012 of the Brazilian National Health Council and was approved by the Research Ethics Committee under Opinion No. 4.479.127, on February 12, 2021.

Results

A total of 48 patients were randomized, aged between 45 and 85 years, with 24 allocated to the intervention group (IG) and 24 to the control group (CG). There were no statistically significant differences in sociodemographic or clinical characteristics between groups (Table 1).

Table 1*Sociodemographic and clinical characteristics of participants in the IG and CG. Ijuí/RS, Brazil, 2022*

Variables		IG n(%)	CG n(%)	<i>p</i>
Sex	Female	12(46.2)	14(53.8)	0.454
	Male	12(57.1)	9(42.9)	
Age (Years)	45-60	11(57.9)	8(42.1)	0.440
	> 60	13(46.4)	15(53.6)	
Marital status	Married/Stable union	21(55.3)	17(44.7)	0.243
	Single/Widowed/Divorced	2(25)	6(75)	
Education	Up to 8 years	15(51.7)	14(48.3)	0.460
	More than 8 years	6(40)	9(60)	
Per capita income	Up to one minimum wage	13(50)	13(50)	1.000
	More than one minimum wage	4(44.4)	5(55.6)	
Time since diagnosis	Up to 1 year	20(48.8)	21(51.2)	0.413
	More than 1 year	4(66.7)	2(33.3)	
Metastasis	Yes	1(20)	4(80)	0.293
	No	4(57.1)	3(42.9)	
First hospitalization	Yes	13(43.3)	17(56.7)	0.227
	No	11(64.7)	6(35.3)	
Treatment	Surgical	19(55.9)	15(44.1)	0.397
	Combined*	5(41.7)	7(58.3)	

Note. IG = Intervention Group; CG = Control Group; SD = Standard Deviation; *p*-value = Significance test.

* Combined treatment was considered when the patient received more than one type of intervention (e.g., surgical and chemotherapy).

Source: Prepared by the author (2022).

The overall CTM-15 (Table 2) was satisfactory, with no statistically significant difference between groups. The Health management preparation domain obtained the highest mean score in both groups. In the Important preferences factor, the CG had a satisfactory mean score, while the IG had an

unsatisfactory mean score, without statistical significance. The Care plan factor was considered unsatisfactory in both groups, with no significant difference. A statistically significant difference was found in the Medication understanding factor, with significantly higher scores in the CG ($p = 0.037$).

Table 2*Care transition assessment, CTM-15 mean scores and comparison between IG and CG. Ijuí/RS, Brazil, 2022*

Factor	Group	Mean	SD	<i>p</i>
Overall CTM-15	IG	70.7	8.5	0.191
	CG	75.1	12.9	
Health management preparation	IG	80.1	10.1	0.983
	CG	80.0	10.9	
Medication understanding	IG	68.6	20.3	0.037
	CG	79.5	11.7	
Preferences ensured	IG	66.2	11.6	0.116
	CG	73.4	17.1	
Care plan	IG	67.8	15	0.967
	CG	67.6	22.7	

Note. CTM-15 = Care Transition Measure; IG = Intervention Group; CG = Control Group; SD = Standard Deviation; *p*-value = Significance test.

Source: Prepared by the author (2022).

In the QoL analysis conducted 90 days after hospital discharge (Table 3), no statistically significant differences were found between groups in the functional domains (physical, role, cognitive, emotional, and social function-

ing). When comparing symptoms, statistically significant differences were found for dyspnea ($p = 0.018$) and insomnia ($p = 0.021$), with significantly higher mean scores in the IG.

Table 3

Quality of life assessment using the EORTC QLQ-C30 and comparison between IG and CG. Ijuí/RS, Brazil. 2022 – 90 days

Scale	Group	Mean	SD	<i>p</i>
Physical functioning	IG	73.3	17.4	0.264
	CG	64.6	25.1	
Role functioning	IG	69.1	38.3	0.486
	CG	76.6	35.1	
Emotional functioning	IG	62.9	29.9	0.585
	CG	67.5	30.6	
Cognitive functioning	IG	74.1	25	0.769
	CG	74.9	28.3	
Social functioning	IG	79.1	31.4	0.662
	GC	78.3	27	
Fatigue	IG	70.5	29.3	0.480
	CG	75.5	28.5	
Nausea and vomiting	IG	75.8	30.8	0.108
	CG	85.8	29.2	
Pain	IG	76.6	32.6	0.245
	CG	85.0	27.5	
Dyspnea	IG	11.6	24.8	0.018
	CG	0.0	0	
Insomnia	IG	31.6	38.1	0.021
	CG	11.6	19.5	
Loss of appetite	IG	26.6	36.8	0.085
	CG	10	26.7	
Constipation	IG	30	38	0.143
	CG	13.3	25.1	
Diarrhea	IG	11.6	24.8	0.204
	CG	3.3	10.2	
Financial difficulties	IG	28.3	42.2	0.988
	CG	25	35.6	
Overall health status	IG	67.9	19.5	0.116
	CG	77.9	16.5	

Note. IG = Intervention Group; CG = Control Group; SD = Standard Deviation; p-value = Significance test.

Source: Prepared by the author (2022).

Considering the longitudinal analysis of data collected using the EORTC QLQ-C30, in the comparison between groups, the GEE model was adjusted to evaluate the effects of time and group as a whole. There was interaction between intervention and time, indicating that the mean scores for QoL evolved differently over time.

Furthermore, an interaction effect was detected in the Social functioning dimension ($p = 0.022$), where the CG showed a greater mean increase in the final evaluation (+14.4 points) compared to the IG (+6.9 points).

In the Fatigue dimension, a significant group-by-time interaction effect ($p = 0.017$) was observed. While the

IG showed a minimal increase in mean scores at the end of the intervention (+2.4 points), the CG had a more pronounced increase of 20.4 points.

Concerning the Dyspnea dimension, a significant interaction effect ($p < 0.001$) was also observed. Although the IG showed a slight increase in the mean scores at the final evaluation (+4.7 points), the CG had a reduction of 9.7 points over the same period.

In the Insomnia dimension, a significant intervention effect was observed ($p = 0.006$). While the IG showed a minimal increase in mean scores at the final evaluation (+ 2.4 points), the CG had a reduction in mean scores over the same period (- 35.6 points).

When comparing hospital length of stay between IG and CG, the mean duration was 4.5 days ($SD = 1.38$) in the IG and 6.8 days ($SD = 9.0$) in the CG ($p = 0.380$). The median length of stay was 4 days in both groups. Regarding hospital readmissions at 30 days, two cases were recorded in each group, with no statistical difference. No readmissions were reported at 60 and 90 days. Concerning emergency department visits, two visits were reported in the IG within 30 days, and none at 60 and 90 days.

Discussion

This study found that the overall mean score of the CTM-15 was satisfactory, with no statistically significant difference between groups. In relation to QoL, no statistically significant differences were found between the groups, except in the symptoms of dyspnea and insomnia. When comparing baseline (time 0) and 90 days after discharge, statistically significant differences were identified in the symptoms of fatigue, pain, dyspnea, insomnia, and diarrhea, with lower scores in the CG. Although the IG had a shorter mean hospital length of stay, the difference was not statistically significant. Regarding emergency department visits, only two visits were reported in the IG within 30 days, and no visits were recorded in either group at 60 and 90 days.

Although no statistically significant differences were observed between groups in most outcomes, the trend toward reduced demand for emergency services in the IG are consistent with findings from international studies. However, it must be investigated in large sample sizes. TC interventions have been shown to significantly reduce hospital readmissions, healthcare costs, and unplanned service utilization in oncology populations (Gheno et al., 2024). These results suggest that the absence of significant differences may be related to sample size limitations rather than the lack of effectiveness of the intervention. CT is a complex and comprehensive process that requires the integration of the entire health network, providing benefits for both patients and services by reducing adverse events and the demand on hospital care (Xu et al., 2024). A Brazilian study conducted with patients with neoplasms of the digestive system reported a satisfactory overall CTM-15 mean score (74.1), with weaknesses in the factors Important preferences (69.4) and Care plan (66.1; Rodrigues et al., 2022).

Post-discharge strategies such as telephone follow-up, active surveillance programs via telemedicine, TC programs, and standardized multidisciplinary recovery protocols have been shown to be effective (Trindade et al., 2022). In the present study, the IG showed improvements in symptoms such as fatigue, pain, dyspnea, insomnia, and diarrhea, which may reflect the benefits of structured follow-up and individualized discharge planning. International evidence supports this interpretation, as TC programs have been shown to improve QoL and symptom control in cancer patients (Griffin et al., 2024; Xu et al., 2024; Kersen et al., 2024). These findings emphasize the relevance of patient and family-centered approaches during the hospital-to-home transition, with nurses playing a central role in education and care coordination.

Given the risk of complications in patients undergoing treatment for CRC, such as infections and surgical trauma, a CT strategy centered on a standardized and personalized care plan aimed at guiding patient follow-up and recovery has demonstrated improvement in CT (Collet et al., 2025). However, ensuring continuity of care across Brazilian health services has been a major challenge (Van Grootel et al., 2025). Treatment for CRC can affect patient's QoL, highlighting the need for strategies that support both patients and their families in order to reduce the physical and emotional burden associated with treatment. A study conducted in Brazil showed that the most prevalent symptoms were nausea and vomiting, diarrhea, and dyspnea, which can impact QoL (Carlos et al., 2022).

Studies have shown that the QL of these patients is temporarily reduced by diagnosis and surgical treatment, but improves over time. The most prevalent symptoms in patients diagnosed with cancer are pain, dyspnea, and fatigue (Pereira et al., 2022). From this perspective, the literature highlights opportunities to improve TC for cancer patients, emphasizing patient engagement and individualized strategies during CT (Kersen et al., 2024). The results of a study revealed that the guidance and education provided to the patient during hospitalization increase the family members' capacity to provide care to dependent patients (Rodrigues et al., 2022). Inadequate discharge planning can increase the risk of hospital readmissions and emergency department visits. Developing an adequate care plan during hospitalization promotes safe discharge, continuity, and integration of care, while also reducing hospital readmissions and costs (Zanetoni et al., 2022).

Thus, reducing the length of hospitalization can reduce the risk of morbidity and mortality and hospital costs. Studies indicate that CT strategies have an important impact on reducing readmissions, mortality, and hospital costs (Gheno et al., 2024).

The implementation of patient navigation programs - a process that consists of guiding patients through health services, with nurses serving as key coordinators of care - provides a significant advantage in the quality of cancer care reducing hospital emergency department visits. Thus, planning CT strategies with nurses as coordinators of care can facilitate patient navigation in health services,

contributing positively to the continuity of care. The COVID-19 pandemic brought important challenges to oncology care. The increase in disease cases in May and June 2021 led to the suspension of elective surgeries for three weeks. Another limitation is related to the number of participants in each group and the fact that the study was conducted in a single hospital. Although the strategy was not efficient – possibly due to the limited sample size - it should be adapted and tested in future studies.

Conclusion

In this pilot study, the tested strategy did not improve CT from the perspective of patients and their families, as measured by the CTM-15. Similarly, no significant difference was observed in overall QoL as measured by the EORTC QLQ-C30. Statistically significant differences were found for the symptoms of dyspnea and insomnia, with higher mean scores in the IG. When comparing QoL between baseline (time 0) and 90 days after discharge, no statistically significant differences were found between groups. Regarding nausea and vomiting, a reduction in these symptoms was observed at 90 days, with a statistically significant difference between groups. When comparing symptoms across both evaluation periods, statistically significant differences were found in the usual care group for fatigue, pain, dyspnea, insomnia, and diarrhea. Regarding hospital length of stay, a reduction was observed among the IG, with no statistically significant difference. Similarly, no significant differences were found between groups regarding hospital readmissions and emergency department visits.

Overall, no statistically significant differences were found between the IG and the CG regarding the effectiveness of the CT strategy for the outcomes analyzed. It should be noted that this is a pilot study; therefore, the total sample (*n*) will be evaluated in a future study.

Author contributions

Conceptualization: Oliveira, A. L., Lorenzini, E., Danielle, M. B., Canón-Montañez, W., Trindade, L. F., Kolankiewicz, A. C.

Data curation: Oliveira, A. L., Lorenzini, E., Kolankiewicz, A. C.

Formal analysis: Oliveira, A. L., Lorenzini, E., Canón-Montañez, W., Kolankiewicz, A. C.

Investigation: Oliveira, A. L., Lorenzini, E., Kolankiewicz, A. C.

Methodology: Oliveira, A. L., Lorenzini, E., Kolankiewicz, A. C.

Project administration: Oliveira, A. L., Lorenzini, E., Canón-Montañez, W., Kolankiewicz, A. C.

Resources: Oliveira, A. L., Canón-Montañez, W., Kolankiewicz, A. C.

Supervision: Oliveira, A. L., Lorenzini, E., Kolankiewicz, A. C.

Validation: Oliveira, A. L., Lorenzini, E., Kolankiewicz, A. C.

Visualization: Oliveira, A. L., Danielle, M. B., Canón-

-Montañez, W., Trindade, L. F., Kolankiewicz, A. C.
Writing – original draft: Oliveira, A. L., Danielle, M. B., Canón-Montañez, W., Trindade, L. F., Kolankiewicz, A. C.

Writing – review & editing: Oliveira, A. L., Danielle, M. B., Canón-Montañez, W., Trindade, L. F., Kolankiewicz, A. C.

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