Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Quality Improvement Cycle in Patient-Centered Care for Oncology Patients in an Outpatient Service

Albertina Proença Rodrigues Alves
Federal University of Rio Grande do Norte
Michel Siqueira da Silva
siqueira.silva.091@ufrn.edu.br
Federal University of Rio Grande do Norte (UFRN), ZIP Code, Residencial Nova Amsterdã
Susana Cecagno
Federal University of Pelotas
Vilani Medeiros Araújo Nunes
Federal University of Rio Grande do Norte (UFRN), ZIP Code

Research Article

Keywords: palliative care, oncology, total quality management, social work, patient-centered care, multidisciplinary team

Posted Date: July 3rd, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9557528/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Quality Improvement Cycle in Patient-Centered Care for Oncology Patients in an Outpatient Service

Albertina Proença Rodrigues Alves[1], Michel Siqueira da Silva[2], Susana Cecagno[3], Vilani Medeiros de Araújo Nunes[4]

[1]Postgraduate Program in Quality Management in Health Services, Federal University of Rio Grande do Norte (UFRN), Natal, RN, Brazil. ORCID: https://orcid.org/0009-0003-0379-6737. E-mail: albertinaalves84@gmail.com

[2]Graduate Program in Health Sciences, Federal University of Rio Grande do Norte (UFRN), Rua General Gustavo Cordeiro de Farias, s/n, 2nd floor, Health Sciences Center (CCS/UFRN), Natal, Rio Grande do Norte, ZIP Code 59010-054, Brazil. ORCID: https://orcid.org/0000-0002-0391-3249. E-mail: siqueira.silva.091@ufrn.edu.br

[3]Federal University of Pelotas, Campus Anglo, Rua Gomes Carneiro, 1, Centro, 96010-610, Pelotas, Rio Grande do Sul, Brazil. ORCID: https://orcid.org/0000-0002-3953-0688. E-mail: cecagno@gmail.com

[4]Department of Public Health, Federal University of Rio Grande do Norte (UFRN), Av. Senador Salgado Filho, 3000, Lagoa Nova, ZIP Code 59078-900, Natal, Rio Grande do Norte, Brazil. ORCID: https://orcid.org/0000-0002-9547-0093. E-mail: vilani.nunes@ufrn.br

*Corresponding author:
Michel Siqueira da Silva, MSc candidate, Graduate Program in Health Sciences, Federal University of Rio Grande do Norte (UFRN). Address: Avenida dos Caiapós, 355, Pitimbu, Natal, Rio Grande do Norte, ZIP Code 59067-400, Brazil. Complement: Residencial Nova Amsterdã, Block 12, Apartment 402. Phone: +55 84 98726-1810. E-mail: michelsiqueira10@gmail.com

Abstract

Objective: To evaluate the impact of interventions implemented through a quality improvement cycle in the care of patients identified with a Palliative Performance Scale (PPS) score equal to or lower than 50% in an outpatient oncology service. **Method:** This multi-method study aimed to implement a quality improvement cycle in the palliative care service of an outpatient oncology institution. The research was designed as a quasi-experimental before-and-after study without a control group, with the objective of evaluating the effectiveness of the implemented actions.

Results were assessed through a comparative analysis between the baseline evaluation and two subsequent evaluations (August 2023 and the first quarter of 2024). **Results:** The comparison between the first and third evaluations showed a reduction in nonconformities from 15 to 8 (46.7%). After implementing the planned improvement actions, criterion 1 showed a 50% reduction in nonconformities. Criterion 4 demonstrated a statistical improvement (0.28%); however, further analysis is required because it is associated with multiple influencing factors. **Conclusion:** Different perceptions and expectations regarding palliative care were identified among patients, healthcare professionals, and family members depending on the context and culture in which they are embedded. Therefore, successful practices implemented in other countries may not always be directly applicable to the Brazilian Northeastern context, and vice versa. Nevertheless, this study suggests that analysis using the Improvement Cycle tool can be effective in other health organizations, regardless of their geographic location or the type of patients served, by helping to identify and implement multifaceted actions targeting modifiable causes of improvement opportunities.

Keywords: palliative care; oncology; total quality management; social work; patient-centered care; multidisciplinary team.

1. Introduction

Patients with oncological diseases require healthcare resources capable of adequately managing their symptoms and care needs. Even in settings with limited resources, it is possible to observe the use of invasive methods focused primarily on tumor treatment rather than on the patient's quality of life. In certain stages of the disease, such approaches may become ineffective and distressing, particularly when they no longer provide meaningful clinical benefits [1].

The author also highlights that fostering a culture of patient-centered care that incorporates palliative care can gradually transform this reality. Furthermore, the absence of integrated, comprehensive, and holistic care may lead to prolonged suffering and pain, as well as the inappropriate use and management of healthcare resources. Palliative care is an approach that improves the quality of life of patients and their families facing problems associated with life-threatening illnesses, through the prevention and relief of suffering. This is achieved by means of early identification, comprehensive assessment, and appropriate management of pain and other physical, psychosocial, and spiritual problems (WHO, 2022) [2].

That palliative care was previously conceptualized through a dichotomous perspective that separated disease-modifying care from palliative care. Currently, however, palliative care is considered to be provided simultaneously and complementarily with disease-directed treatment. As

the prognosis worsens and disease-modifying treatments become less effective, palliative care gradually becomes a priority and may eventually become the exclusive approach near the end of life [3].

A mutualistic approach between the healthcare team and patients and/or their representatives, in which clear communication and attentive listening enable patients to participate in decision-making processes related to both curative and palliative treatments. Shared decision-making allows the development of care strategies that place the patient at the center of their own care [4].

Technological innovation in oncology care has prompted the need to reshape healthcare delivery, bringing palliative care as a new model of care grounded in guiding principles rather than strictly in clinical protocols based on technological interventions. Thus, the concept of "terminality" is no longer emphasized; instead, attention is given to diseases that threaten life. This perspective expands the scope of palliative care from the moment of diagnosis. Consequently, palliative care should not be associated with the impossibility of cure but rather with the evaluation of treatments that no longer modify the disease course, thereby moving away from the notion that "nothing more can be done" [5].

An important milestone for palliative care in Brazil was the publication of Ordinance GM/MS No. 3681 of 2024, which defines palliative care as healthcare actions and services aimed at relieving pain, suffering, and other symptoms in individuals facing diseases or conditions that threaten or limit the continuity of life [6].

Within the outpatient context of care for oncology patients, several possible clinical outcomes must be considered, including cure, disease control with alternating types of care, and death. Throughout this trajectory, the patient's quality of life and personal wishes should remain central. In oncology services, the decision to discontinue chemotherapy when it is no longer beneficial, together with the management of expectations regarding clinical outcomes, represents a significant challenge, particularly in healthcare cultures that traditionally emphasize curative medicine.

One of the main challenges for the implementation of palliative care services in Brazil is the gap in professional training to adequately support patients requiring this type of care, as well as a professional education model strongly oriented toward curative outcomes [7].

Notes that continuous developments and innovations in antineoplastic therapies have resulted in greater treatment effectiveness and increased survival among patients with advanced cancer. However, there remains a gap in research addressing the physical, psychosocial, and existential dimensions experienced by patients with advanced cancer. Early integration of palliative care services soon after the identification of advanced cancer is currently considered the gold standard

in cancer treatment. The author also highlights that engagement with palliative care promotes opportunities to focus on quality of life and symptom control [8].

In the chapter *Patient Assessment and Prognostic Indices* of the *Manual of Palliative Care*, functional assessment in palliative care is essential for monitoring the disease trajectory and represents an important element in clinical decision-making. One of the tools used for this purpose is the Palliative Performance Scale (PPS), developed by the Victoria Hospice Society. This scale evaluates ambulation, activity and evidence of disease, self-care, intake, and level of consciousness. Lower scores indicate greater dependence on assistance for activities of daily living [9,19].

Some authors estimate a 30-day survival rate for patients with a PPS score of 40%, whether they have cancer or not. The authors further emphasize that lower PPS scores are associated with a lower life expectancy [10].

Twelve aspects identified by a British group studying the health of the elderly are described in the literature as characterizing a “good death”. According to this perspective, patients should: know when death is approaching and understand what to expect; maintain control over what will happen; have their dignity and privacy respected; maintain control over pain relief and symptom management; choose where death will occur; express advance directives regarding their wishes and have them respected; decide who will be present and with whom they wish to share the end of life; have time to say goodbye; maintain control over certain aspects of the moment; and die at the appropriate time, without unnecessary prolongation of life [5].

This study on planning and implementing quality management programs in health services discusses the dimensions and definitions of quality in health care. Based on the framework proposed by the World Health Organization, quality in health care is organized into seven dimensions: patient-centered care, effectiveness, safety, accessibility, equity, efficiency and integration [11].

For this study, the definition of quality in healthcare proposed by the Institute of Medicine was adopted, which states that quality refers to the degree to which health services for individuals and populations increase the likelihood of achieving desired health outcomes and are consistent with current professional knowledge [12].

Within the outpatient oncology care setting, identifying patients with a PPS score of 50% aims to provide guidance and palliative care services at a stage when patients are still able to participate in decisions about their care and when families can be prepared in a context that does not yet require home or hospital support services.

Therefore, the present study aims to evaluate the impact of interventions implemented through a quality improvement cycle in the care of patients identified with a PPS score equal to or lower than 50% in an outpatient oncology service, seeking to achieve the dimensions of patient-centered care, effectiveness, accessibility, safety, efficiency, and integration.

Accordingly, the study addresses the following guiding research question: Can multifaceted interventions promote improvements in the palliative care process within an outpatient oncology service?

It is expected that this study, through its methodology and scientific evidence, will contribute to the development of strategies for identifying patients who may benefit from earlier priority palliative care within the outpatient oncology center where the author works, as well as in similar institutions, thereby increasing the opportunity for patients to remain at the center of their care throughout the course of their lives.

1.1. Objectives

1.1.1. General Objective

To evaluate the impact of interventions implemented through a quality improvement cycle in the care of patients identified with a Palliative Performance Scale (PPS) score equal to or lower than 50% in an outpatient oncology service.

1.1.2 Specific Objectives

- To assess the level of quality in the palliative care process for oncology patients based on predetermined classification criteria derived from the PPS.
- To identify improvement opportunities that require intervention.
- To plan and implement multifaceted interventions to enhance care for oncology patients who no longer benefit from disease-modifying treatments.

2. Method

2.1. Type and Study Design

This study was designed to implement a quality improvement cycle in a palliative care service provided within an outpatient oncology institution. Initially, baseline data were collected through an initial assessment using pre-established criteria, followed by a reassessment after the implementation of the planned interventions. The research was conducted as a quasi-experimental before-and-after study without a control group, using a quantitative approach, with the objective of

evaluating the effectiveness of the actions planned and implemented during the intervention process.

Conducting a quality improvement cycle requires identifying an opportunity for improvement and defining criteria that will serve as markers to determine whether the proposed interventions lead to improvement. To this end, quality management tools and techniques were employed to identify process gaps and outcomes that could be improved within the healthcare service context. Accordingly, a series of sequential steps were established, enabling the process to progress from problem identification to the analysis of results obtained after the implementation of improvement actions, based on the methodology proposed by Saturno Hernández for the Improvement Cycle [13].

Thus, the following stages were carried out in this study: identification and prioritization of the quality problem; analysis of the causes of the identified issues; definition of criteria for measuring the level of quality; initial assessment of compliance with the criteria; planning and implementation of improvement actions; and reassessment of the criteria for comparative analysis [14].

2.2. Study Setting

This study was conducted in an outpatient oncology service located in the city of Fortaleza, in the state of Ceará, Brazil. The service performs an average of approximately 2,000 medical consultations and around 1,000 chemotherapy and supportive medication infusions per month. The institution prioritizes safe and high-quality care, and among its core values are safety, continuous improvement, and patient-centered care, aiming to continuously develop alternative approaches to support oncology patient care.

Regarding quality management, the institution is certified at Level 1 by the Organização Nacional de Acreditação (ONA), a certification granted to healthcare institutions that achieve at least 70% compliance with Brazilian standards for quality and patient safety in healthcare. The institution has a Quality Office responsible for leading quality and safety initiatives within the service. The author of this study manages this office and works alongside three additional professionals.

The epidemiological profile of patients treated at the oncology center indicates that 73% are women, with 46% aged between 61 and 80 years. The most prevalent condition among patients is breast cancer, accounting for 45.3% of the cases. All patients included in this study are beneficiaries of supplementary private healthcare coverage from different health insurance plans that provide access to chemotherapy treatment. However, coverage for palliative care services is not included among the mandatory procedures required by these health insurance plans.

2.3. Study Population

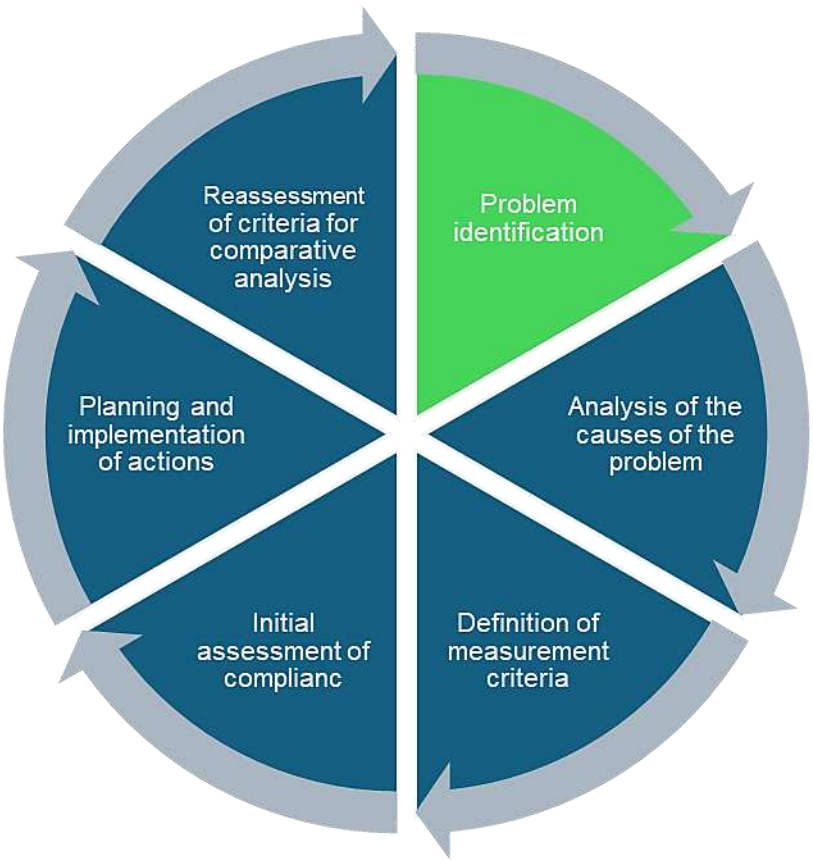
This study included all patients aged 18 years or older who were undergoing chemotherapy treatment from the second chemotherapy cycle onward at the Fortaleza Oncology Unit between January 2023 and March 2024 and who agreed to participate in the study.

Patients were excluded if they: Were participating in clinical research studies and therefore undergoing other investigational protocols; were receiving procedures exclusively for saline flushing of venous access or other types of infusion therapy not classified as chemotherapy; were initiating chemotherapy treatment in their first treatment cycle.

2.4. Development of the Quality Improvement Cycle

The stages of the study followed the Improvement Cycle methodology, based on the framework proposed by Saturno [13]. The corresponding stage of the improvement cycle is presented in Figure 1.

Figure 1 - Improvement Cycle (problem identification).



Source: Research data, 2024.

2.5. Identification and Prioritization of the Quality Problem

The identification and prioritization of the quality problem were conducted by the institution's management and quality team. This team consisted of two physicians (the Administrative Medical Director and the Clinical Director), the Nursing Manager, the Pharmacy Coordinator, the Administrative Manager, the Communication and Marketing Executive, two Quality Analysts (with backgrounds in pharmacy and nursing), and the author of this study, a social worker who serves as the Quality Manager.

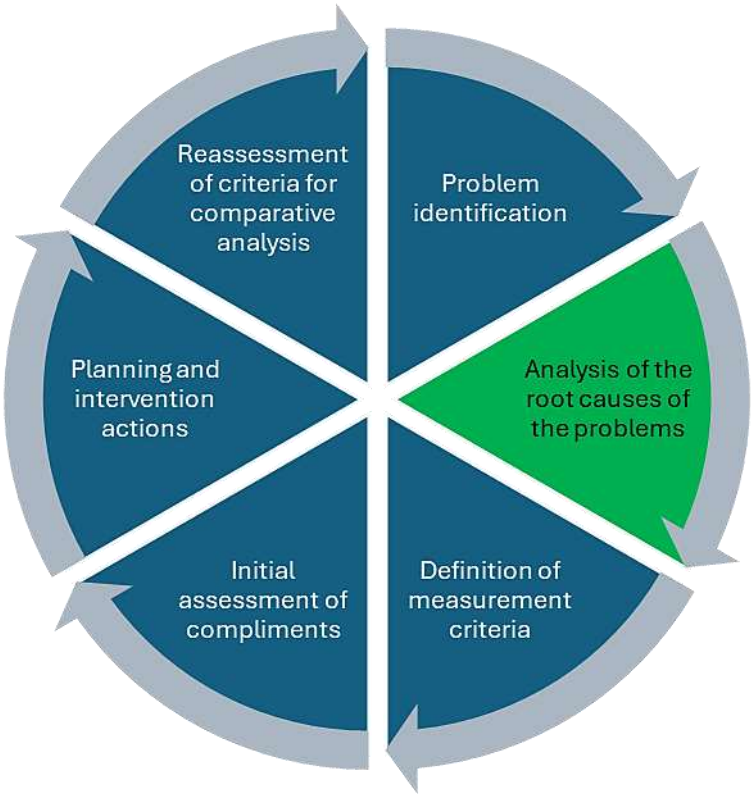
For the decision-making process regarding the identification of improvement opportunities, each participant was invited to select four to five issues they considered to be process-related problems that could be improved. These issues were then consolidated and ranked, and the three most frequently selected problems were identified and advanced to the next stages of the analysis.

Subsequently, a prioritization matrix was applied considering the following aspects: whether the problem affected a large number of patients, whether the solution depended primarily on internal efforts, and whether the solution required limited financial resources. After this analysis, the prioritized improvement opportunity was identified as evaluating the reasons for the low adherence of the healthcare team in decision-making related to palliative care.

2.6. Analysis of the Causes of the Problem

The stage corresponding to the analysis of the causes of the problem is presented in Figure 2.

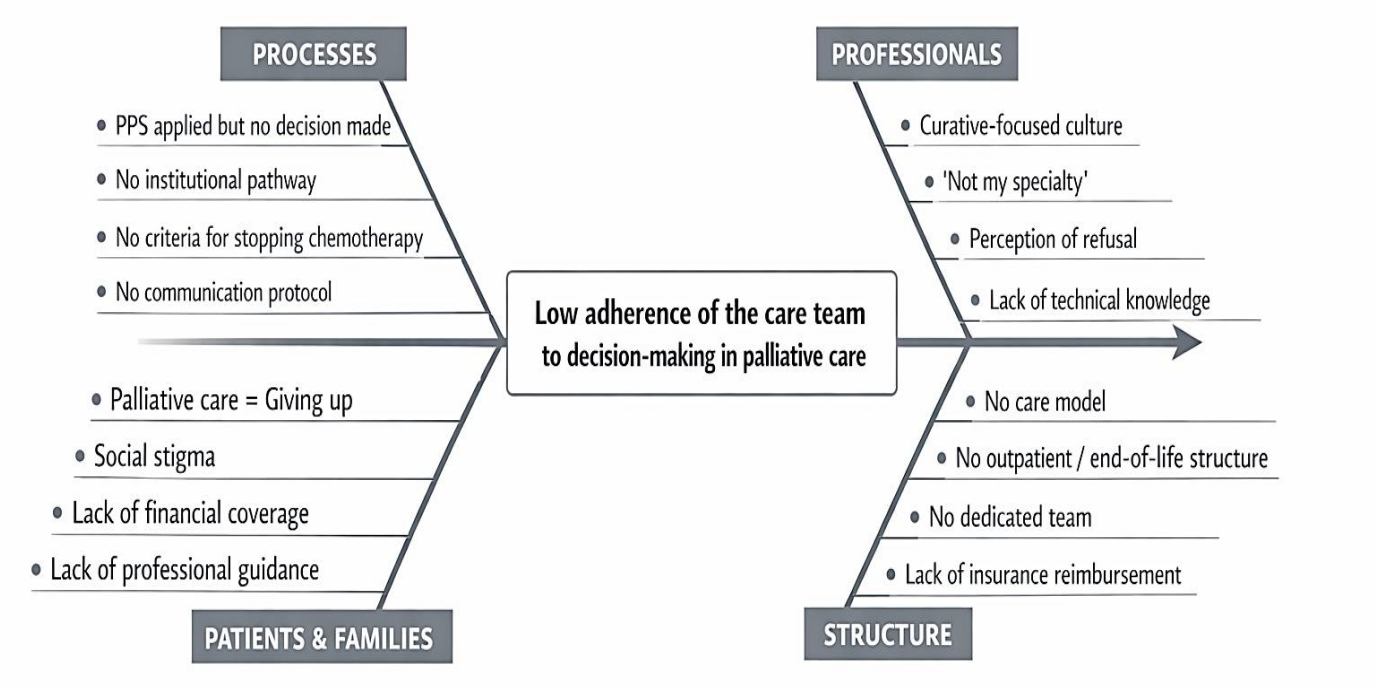
Figure 2 – Improvement Cycle (analysis of the causes of the problem).



Source: Research data, 2024.

The improvement team designated to address this improvement opportunity consisted of a palliative care physician, a nurse navigator, the technical manager, and the quality nurse. These professionals were invited to analyze the causes of the low adherence among healthcare professionals in decision-making related to palliative care. The Ishikawa diagram related to the improvement opportunity is presented in Figure 3.

Figure 3 – Ishikawa Diagram of the improvement opportunity "Low adherence of the healthcare team in decision-making regarding palliative care": emphasis on process and patient factors. Rio Grande do Norte, Brazil, 2024.



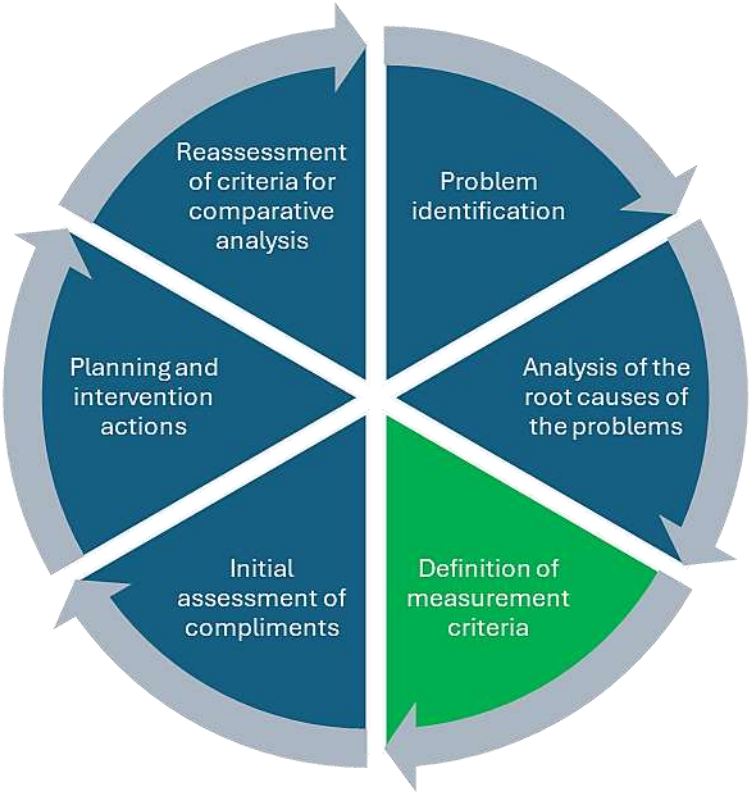
Source: Research data, 2024.

In this analysis, according to the Improvement Cycle methodology, the causes hypothetically identified as modifiable were prioritized over structural causes. Therefore, the improvement team selected the causes classified as “process-related” in the Ishikawa Diagram for further analysis and intervention.

2.7. Definition of Quality Measurement Criteria

The stage corresponding to the definition of quality measurement criteria is presented in Figure 4.

Figure 4 – Improvement Cycle: definition of measurement criteria.



Source: Research data, 2024.

The process for identifying patients with a PPS score of 50% or lower, aimed at supporting decisions regarding the intensification of palliative care, was already established in the institution where the study was conducted. The first PPS assessment was performed by the nurse navigation team. From the second chemotherapy cycle onward, the assessment was carried out by the clinical nursing staff each time the patient received an infusion, and at the end of each day the information was recorded in the patient's electronic medical record.

On a weekly basis, the nurse navigation team generated a report identifying patients with PPS scores equal to or lower than 50% and notified the attending physicians through a multiplatform instant messaging application. The decision on how to act upon this information was left exclusively to the attending physician.

For the purposes of this study, quality criteria were defined based on the existing process and on the causes identified in the previous phase of the improvement cycle. The criteria selected to evaluate the effectiveness of the interventions are presented in Tables 1 and 2.

The following criteria were selected to evaluate the effectiveness of the interventions:

Table 1 – Criteria for evaluating the interventions.

	Statement	**Exceptions**	**Clarifications**
Criterion 1 (C1)	Application of the Palliative Performance Scale (PPS) must be performed at each chemotherapy cycle for all patients undergoing treatment from the second cycle onward.	Patients undergoing clinical trial treatment and/or those in the first chemotherapy cycle and/or those not receiving chemotherapy treatment.	The scale must be applied by a nurse upon the patient's arrival and the result recorded in the patient's electronic medical record (PPS scale in the Tasy system) on the first day of the cycle. The scale should be applied following the horizontal sequence, selecting the category that best corresponds to the patient according to the following criteria: ambulation, activity and evidence of disease, self-care, intake, and level of consciousness.

Table 2 – Conclusions of the intervention evaluation criteria.

	Statement	**Exceptions**	**Clarifications**
Criterion 2 (C2)	Request to the attending physician to reassess the therapeutic plan of patients with a Palliative Performance Scale (PPS) score equal to or lower than 50%.	Patients who maintain the same score and whose case has already been evaluated when the PPS result was first identified as equal to or lower than 50%.	On the first business day of each week, the nurse navigator must extract from the Tasy information system the report of PPS assessments performed during the previous week. Subsequently, patients with a score equal to or lower than 50% should be identified, and their cases should be discussed with the attending physician to evaluate the continuation, modification, or discontinuation of the chemotherapy protocol. Evidence of this process will be considered the documentation recorded in the Tasy system by the

			physician or the multidisciplinary team regarding the evaluation and decision-making process.
Criterion 3 (C3)	Meeting with the patient and/or family members to discuss palliative care for patients with a Palliative Performance Scale (PPS) score equal to or lower than 50%.	Patients for whom, under Criterion 2, the decision was made to continue chemotherapy treatment.	Evidence will be considered as the documentation recorded in the Tasy system by the physician or the multidisciplinary team regarding the evaluation and decision-making process.
Criterion 4 (C4)	Evaluation of the interval between the last chemotherapy session and death was equal to or greater than 30 days.	Patients who died within less than 30 days due to complications unrelated to the underlying disease and patients for whom the date of death cannot be identified.	The calculation will be based on the interval between the last day of chemotherapy administration and the date of death recorded in the Tasy system.

Source: Research data, 2024

The classification of each criterion according to the quality dimension and type of data is presented in Table 3.

Table 3 – Classification by quality dimension and data type.

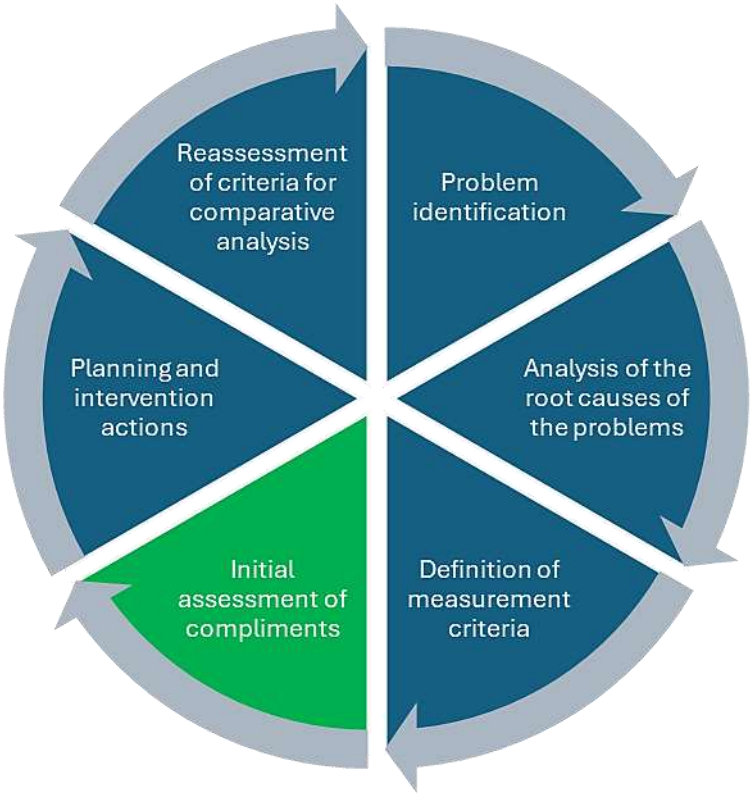
	DIMENSION	**TYPE OF DATA**
CRITERION 1 (C1)	Effectiveness	Process
CRITERION 2 (C2)	Effectiveness	Process
CRITERION 3 (C3)	Patient-centered care	Process
CRITERION 4 (C4)	Effectiveness	Outcome
	Efficiency	
	Safety	
	Patient-centered care	

Source: Research data, 2024

2.8. Evaluation of the Initial Quality Criteria

The stage corresponding to the initial assessment of compliance with the criteria is presented in Figure 5.

Figure 5 – Phases of the Improvement Cycle.



Source: Research data, 2024

For the initial evaluation and baseline assessment of the study, patients who received chemotherapy care during the first quarter of 2023 were identified in the electronic medical records of Pronutrir (Tasy system). The data were analyzed without patient identification and subsequently exported to an Excel spreadsheet in order to measure and verify adherence to the established process prior to the intervention.

Each chemotherapy protocol defines treatment cycles (intervals between medication administrations) and the method of administration. Since the objective was to monitor the patient's palliative performance after the initiation of treatment, the following variables were observed: number of visits, treatment cycle, type of protocol, PPS scale result, documentation in the medical record of communication to the physician regarding the scale result, and documentation of the physician’s clinical decision.

The researcher, with access to the information, produced the results of the measurement criteria for the improvement team in an anonymous manner, and no direct contact with patients was conducted. All data were extracted directly from the medical records after documentation of the care provided to the patient.

From the identified population, a random and anonymous sample of 30 patients was selected for reliability evaluation using the website www.sorteio.com.br. The medical records were analyzed and the data were extracted independently by two reviewers.

After data collection, the Kappa coefficient was calculated to assess the level of agreement observed, with the following results:

$$\frac{Po - Pe}{1 - Pe} = \frac{(1 - 0.08744)}{(1 - 0.08744)} = 1$$

The prevalence was estimated at 0.93, and the data obtained indicate that the criterion is highly reliable. The overall agreement result was sufficient to support this conclusion without the need to apply the Kappa Index. However, the Kappa Index was calculated and showed good reliability, demonstrating that it was not necessary to rely on the estimated prevalence. After validation, for the application of these two tests to evaluate the level of quality, the total number of cases identified during the study period was used; therefore, no sampling method was defined.

To analyze the impact of the interventions, the differences between the initial evaluation conducted in the first quarter of 2023, a first reassessment after the intervention, and a third evaluation conducted in the first quarter of 2024 were presented. The data were analyzed using absolute and relative values.

In his work on the analysis and presentation of comparative results between two evaluations, Saturno Hernández recommends the use of a one-sided hypothesis test to assess statistical significance. In this approach, the null hypothesis for improvement is rejected when results present a value lower than 0.05, which was adopted for the analysis in this study [11].

The results of the evaluations were presented using Pareto charts to verify and analyze the main causes of nonconformities. This type of chart facilitates the visualization of the criteria that should be prioritized by demonstrating cumulative frequency. According to the Pareto principle, 80% of defects are concentrated in 20% of causes, and these should therefore be prioritized when attempting to solve the problem. The analysis was also conducted comparatively across the three evaluation periods for the same criterion.

2.9. Ethical Aspects

The study followed the ethical principles established in the Guidelines and Regulatory Standards for Research Involving Human Beings, according to Resolution No. 466/12 [16]. It also

complied with Resolution No. 510/16 of the National Health Council of the Ministry of Health regarding research involving human subjects [17].

2.9.1. Consent for Participation

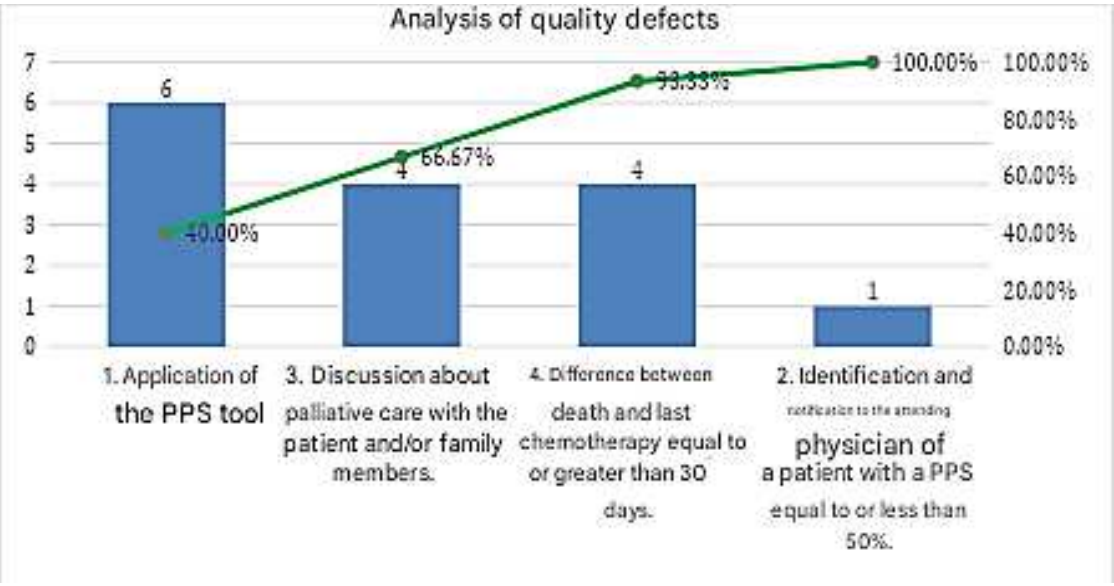
All participants included in the study provided consent to participate. The study was authorized by the institution through a Letter of Agreement and Institutional Authorization for the use of information contained in medical records. The study was reviewed and approved by the Research Ethics Committee of the Federal University of Rio Grande do Norte under Opinion No. 6,222,634 and CAAE No. 70528823.9.0000.0523, in accordance with Brazilian National Health Council Resolutions No. 466/2012 and No. 510/2016.

2.10. Baseline Quality Assessment

All criteria were evaluated in 100% of the cases. As no sample was used, confidence estimation was not applied. The baseline distribution of quality defects identified from January to March 2023 is presented in Graph 1.

In the initial evaluation, 301 cases were identified, with the following results:

Graph 1 – Analysis of quality defects (January to March 2023).



Source: Research data, 2024.

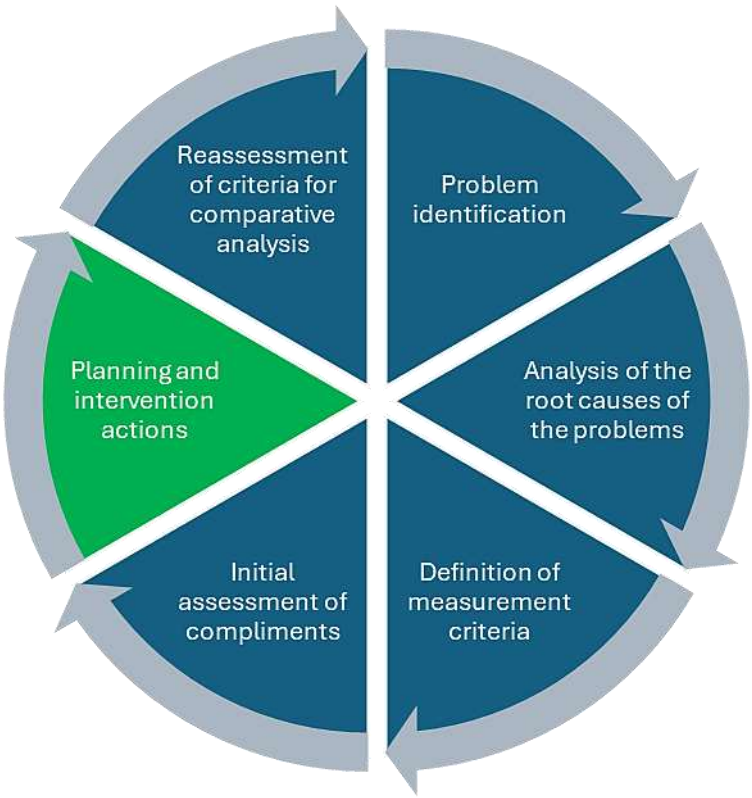
When analyzing the data using the Pareto chart, a priority need for intervention was identified in Criteria 1, 4, and 3. However, it is noteworthy that the number of cases for each

criterion differs, and therefore it is also necessary to analyze the percentage achievement of each criterion.

2.11. Planning and Implementation of Improvement Actions

The stage corresponding to the planning and implementation of improvement actions is presented in Figure 6.

Figure 6 – Improvement Cycle (planning and implementation of actions).



Source: Research data, 2024

The results obtained from the first measurement of the four criteria selected to evaluate the improvement opportunity in this study were presented to the Improvement Team during a meeting for analysis and proposal of interventions, using the techniques of multiple voting and the construction of an affinity diagram.

The team members were instructed to individually write their suggestions, without limiting the number of ideas, using the technique of expressing them in three words. After each member reported having completed the task, all suggestions were placed on a whiteboard. For the grouping of similar suggestions, each member was allowed, if desired, to clarify what had been written so that all participants could fully understand the ideas presented.

The suggestions generated by the improvement team and organized according to the affinity diagram are presented in Table 4.

Table 4 – Affinity diagram.

Criterion 1: What should be done to ensure the correct application of the PPS?

1 **Training**	2 **Work reorganization**	3 **Change in the application system**
Training of the nursing team on the PPS **Learning assessment: double-checking in a sample of selected patients.**	Change in the nursing team responsible for applying the PPS. It will now be performed by the triage team	Make the PPS scale available on the nursing team's badge for easy reference

Source: Research data, 2024

Criterion 2: How can we improve effective communication with the physician regarding a PPS score of 50%?

1	2	3
Change in the communication method Direct, in-person communication with the attending physician by the clinical navigation team.		

Conclusion:

Criterion 3: How can the attending physician be engaged in the need to evaluate and discuss palliative care with the patient and family?		
1 **Training**	2 **Multidisciplinary assessment**	3 **Multidisciplinary approach**
Training for the nursing team on the PPS and basic palliative care. Communicate to physicians about the work carried out by the navigation team.	Conduct a case evaluation with the multidisciplinary team involved in the patient's care, including the attending physician and the palliative care physician.	Create a multidisciplinary team to approach families after the evaluation. Engage health insurance providers regarding the palliative care program to facilitate funding for a dedicated team.

Source: Research data, 2024

Criterion 4: What actions can be developed to ensure that the decision to discontinue non-beneficial chemotherapy occurs more than 30 days before the patient's death?		
1	**2**	**3**
Methods for identifying patient deterioration	**More comprehensive evaluation of the timing of patient cases.**	
Create an easy tracking method to identify patients who have experienced a two-level decline in the PPS, regardless of their current score.	Monitor patients included in the study until death throughout the entire improvement cycle.	
Create an easy tracking method to identify patients who have received more than two types of palliative chemotherapy protocols.		

Source: Research data, 2024

During the group analysis, it was considered that Criterion 1, despite presenting a good percentage result when analyzed individually (98.00%), might have been applied improperly, since it was performed when the patient was already being attended in the nursing station, with documentation in the medical record that did not correspond to the intended objective. The team also considered whether the professionals responsible for applying the PPS were the most appropriate for this task.

In the prioritization proposed by the Pareto chart, Criterion 2 appeared in the last position and did not follow the 80/20 proportion. However, the team proposed intervention actions for this criterion as well, considering that the current communication method with the attending physician through WhatsApp might not be effective and could therefore be contributing to the poor performance observed in Criterion 3.

Criterion 3 presented the poorest individual result and was understood as the greatest challenge for the Improvement Team. Suggested interventions included training activities, awareness initiatives, and case discussions involving the multidisciplinary team, the attending physician, and the palliative care physician.

Criterion 4 also required careful consideration regarding the result obtained. For the analysis, this result was evaluated exclusively among patients undergoing chemotherapy treatment during the evaluation period, which may have introduced bias in the findings. Other deaths may have occurred among patients who were no longer receiving treatment because chemotherapy had

already been discontinued due to lack of benefit as either curative or palliative therapy. These cases would represent favorable outcomes but would not have been included in the analysis.

Therefore, an additional monitoring criterion was defined: the 301 patients analyzed in Module 2 would be followed until the completion of the improvement opportunity, aiming for an interval equal to or greater than 30 days between the last chemotherapy session and death.

Another point analyzed by the Improvement Team was that only one of the eleven deaths evaluated had a PPS score of 50%. Based on this observation, two additional criteria for early detection of clinical deterioration were proposed: a reduction in PPS of more than two levels, regardless of the absolute score, and the use of more than two types of chemotherapy treatments with a palliative focus.

To facilitate planning and monitoring of the implementation of improvement actions, a Gantt chart was developed. The actions were distributed among the members of the Improvement Team, who were actively involved in the development and implementation process. The Status column indicates which actions had been effectively implemented by the conclusion of this study.

The planning and monitoring of the implemented improvement actions are presented in the Gantt chart shown in Table 5.

Table 5 – Gantt Chart. Rio Grande do Norte, Brazil, 2024.

	Task	June/23	July/23	August/23	Status
1.	**Conduct training for the nursing triage and navigation teams**	Criteria 1 and 2			Completed
2.	**Conduct training for the remaining nursing staff**	Criteria 1 and 2			Completed
3.	**Monitor one shift of PPS application – double-checking to assess learning – triage team**	Criteria 1 and 2			Completed
4.	**Change the process regarding who applies the PPS scale**	Criteria 1 and 2			Completed
5.	**Communicate directly and personally with the attending physician regarding PPS scores equal to or below 50%**	Criteria 1 and 2			Completed
6.	**Establish a multidisciplinary team (non-exclusive) for palliative care**	All criteria			Completed
7.	**Conduct awareness**		Criterion 3		Completed

activities on the topic with the technical and clinical directors			
8. Conduct the first multidisciplinary case discussion of a patient for palliative care	Criterion 3		Completed
9. Evaluate the case discussion and determine the best way to implement systematic case discussions	Criterion 3		Completed
10. Define a team responsible for approaching the patient/family regarding palliative care (based on the pilot case)	Criterion 3		Completed
11. Implement, through the navigation service, the inclusion of a report identifying two percentage ranges of decline in the PPS scale		Criterion 4	Not performed
12. Identify patients who have undergone more than two chemotherapy protocols with a palliative purpose without success		Criterion 4	Not performed

Source: Research data, 2024

No improvement intervention directly involving patients was implemented until the study received approval from the Research Ethics Committee.

Among the proposed interventions, in August 2023 a multidisciplinary team was established to discuss and monitor patients with PPS scores of 50% or below or with a decline of two levels on the PPS scale.

The team consisted of professionals from nursing, nutrition, psychology, and a physician working with palliative care in the clinic, in addition to the author of the study as quality manager. None of the professionals work exclusively in this activity. Attending physicians with a larger number of patients are invited to discuss their patients or participate whenever they wish.

The team recognized that patients should ideally be identified at an earlier stage, suggesting that the discovery of metastasis or lack of response to second- or third-line treatments may already indicate the need for evaluation and referral to palliative care. However, it was decided that in this first improvement cycle the outcome indicators of PPS ≤50% and/or a two-level decline would be

maintained, considering the service's capacity and the learning process within a pilot project before expanding to additional selection criteria.

The approach for caring for patients in palliative care was developed by this team. As a pilot project, patients identified by the team as requiring priority palliative care, and with the agreement of the attending physician, are invited to participate in follow-up with the team. This includes consultation with a palliative care physician, nutritional and psychological follow-up, and telemonitoring performed by one of the nurses, as well as family conferences depending on each case.

The initial approach to the patient and family is conducted by the attending physician together with a nurse from the team, during which the proposed care plan is explained and participation is voluntary. Follow-up continues until the patient's death, after which psychological support is offered to the primary family caregiver for one month.

Considering the outpatient nature of the service and the need for additional interventions for some patients, the team sought to strengthen relationships with external partners outside the clinic to facilitate transitions of care across different levels of need, such as hospitals and home care services.

The team also developed a group initiative for patients called "Prosseguir" ("Moving Forward"), aimed at welcoming patients who are beginning chemotherapy treatment in this new stage of their journey.

It was not yet possible to create an automated report to identify a two-level decline in the PPS scale; however, this information is currently extracted through an automated search of the electronic medical records and presented to the team responsible for case discussions.

During the team meetings, the following interventions were selected:

- Structuring and establishing weekly regularity for the evaluation of palliative care cases, including the assessment of patients with a two-level decline in the PPS scale;
- Training on palliative care for the entire multidisciplinary team, regardless of their participation in the improvement team;
- Monitoring of identified patients by the multidisciplinary team until death, regardless of funding by health insurance providers or private payment, as part of a pilot project;
- Structuring the Palliative Care Navigation service: prioritization of access to team consultations, communication channels, service extension with home care and/or hospital services, monitoring of hospitalizations and interventions, patient assessment, and nursing telemonitoring every 48 hours;

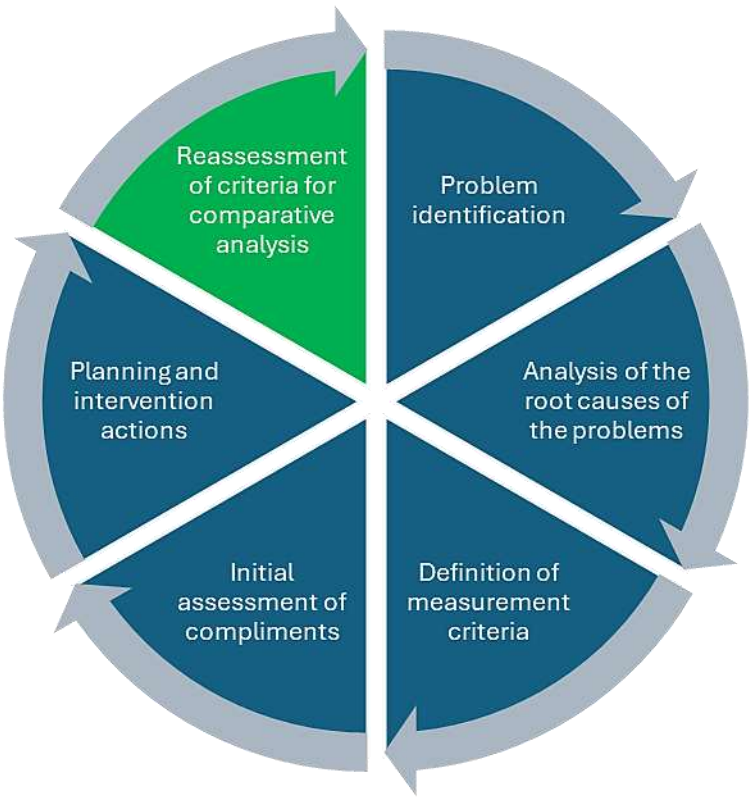
- Benchmarking with private healthcare institutions that provide outpatient palliative care services.

During the meetings, it was also identified that some patients experiencing functional decline might not be monitored if they fail to attend chemotherapy sessions, which could explain treatment absenteeism. Therefore, an active search strategy was implemented for patients who missed scheduled appointments.

3. Results

The stage corresponding to the reassessment of criteria for comparative analysis is presented in Figure 7.

Figure 7 – Improvement Cycle (reassessment of criteria for comparative analysis). Rio Grande do Norte, Brazil, 2024.



Source: Research data, 2024

3.1. Reassessment of Quality Criteria for Comparative Analysis

Two reassessments of the criteria were conducted after the implementation of the proposed interventions: one with patients treated in August 2023 and another with patients treated between January and March 2024, presenting the following results.

The results of the reassessment conducted in August 2023 and in the first quarter of 2024 are presented in Tables 6 and 7, respectively.

Table 6 – Evaluation of compliance with the criteria (August 2023).

Criterion	**Number of cases**	**Compliance**	**Compliance percentage**
1	226	221	97.8%
2	01	01	100.0%
3	01	00	0.00%
4	02	01	50.0%

Source: Research data, 2024

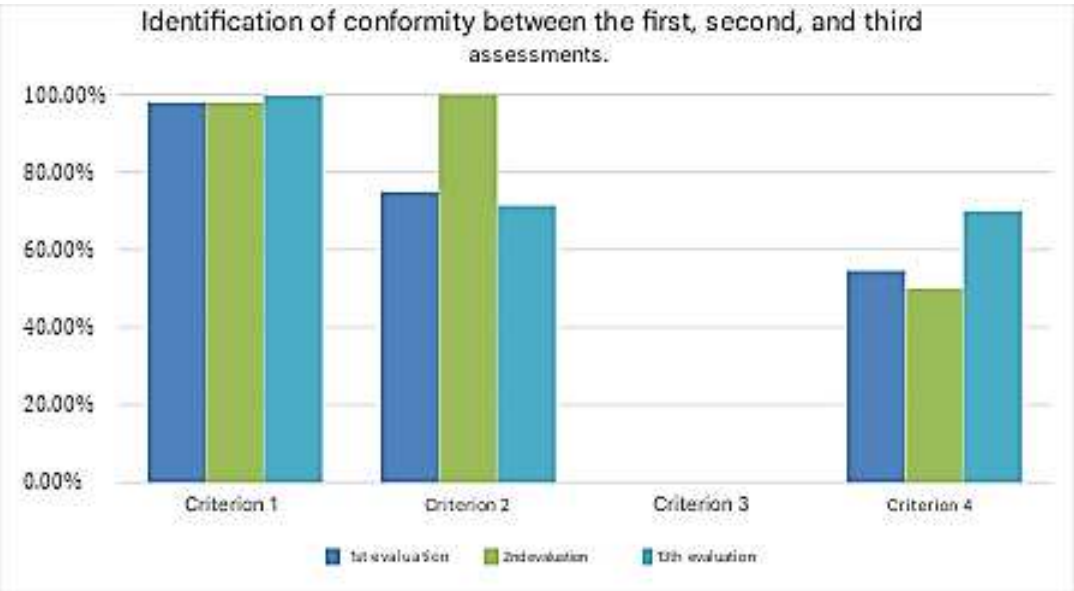
Table 7 – Evaluation of compliance with the criteria (first quarter of 2024).

Criterion	**Number of cases**	**Compliance**	**Compliance percentage**
1	310	309	99.7%
2	07	05	71.4%
3	02	00	0.0%
4	10	07	70.0%

Source: Research data, 2024

The comparison of compliance across the first, second, and third evaluations is presented in Graph 2.

Graph 2 – Identification of compliance between the first, second, and third evaluations.



Source: Research data, 2024

3.2. Effect of the Proposed Intervention

In the absolute comparison (P2–P1) and relative comparison (P2–P1/1–P1) (P2–P1/1–P1) (P2–P1/1–P1), using a one-sided significance test, the following results were identified between the first, second, and third evaluations.

The absolute and relative improvements observed among the three evaluations, including the statistical significance analysis, are presented in Table 8.

Table 8 – Evaluation of absolute and relative improvement among the three evaluations.

Criterion	**Absolute improvement between the 1st and 2nd evaluation**	**Relative improvement between the 1st and 2nd evaluation**	**Statistical significance p > 0.05 between the 1st and 2nd evaluation**	**Absolute improvement between the 1st and 3rd evaluation**	**Relative improvement between the 1st and 3rd evaluation**	**Statistical significance p > 0.05 between the 1st and 3rd evaluation**
C1	-0.20%	0.10%	Significance test not applicable due to negative value	1.70%	0.01%	No statistical significance
C2	25.00%	0.33%	Statistical significance greater than 0.05	-3.60%	0.04%	Did not maintain the statistical significance identified between the 1st and 2nd evaluation. Significance test not applicable due to a negative value.
C3	0.00%	0.00%	No improvement	0.00%	0.00%	No statistical significance
C4	-4.54%	-0.08%	Significance test not applicable due to negative value	15.46	0.28%	Statistical significance greater than 0.05

Source: Research data, 2024

For the initial evaluation and the first and second reassessments, all cases within the study period were analyzed without sampling, resulting in 301, 226, and 310 patients in each evaluation, respectively. A simple rule of three was applied to standardize the number of nonconformities identified and to enable the construction of before-and-after Pareto charts. The resulting values were decimal numbers and were rounded to the nearest whole number.

The adjustment of the number of nonconformities after standardizing the number of patients analyzed between the first and second evaluations is presented in Table 9.

Table 9 – Adjustment of the number of nonconformities after standardizing the number of patients analyzed between the first and second evaluations.

Criterion	Absolute frequency of nonconformities	Absolute frequency of nonconformities adjusted by rule of three
C1	05	07
C2	00	00
C3	01	01
C4	01	01
Total	07	09

Source: Research data, 2024

The adjustment of the number of nonconformities after standardizing the number of patients analyzed between the first and third evaluations is presented in Table 10.

Table 10 – Adjustment of the number of nonconformities after standardizing the number of patients analyzed between the first and third evaluations.

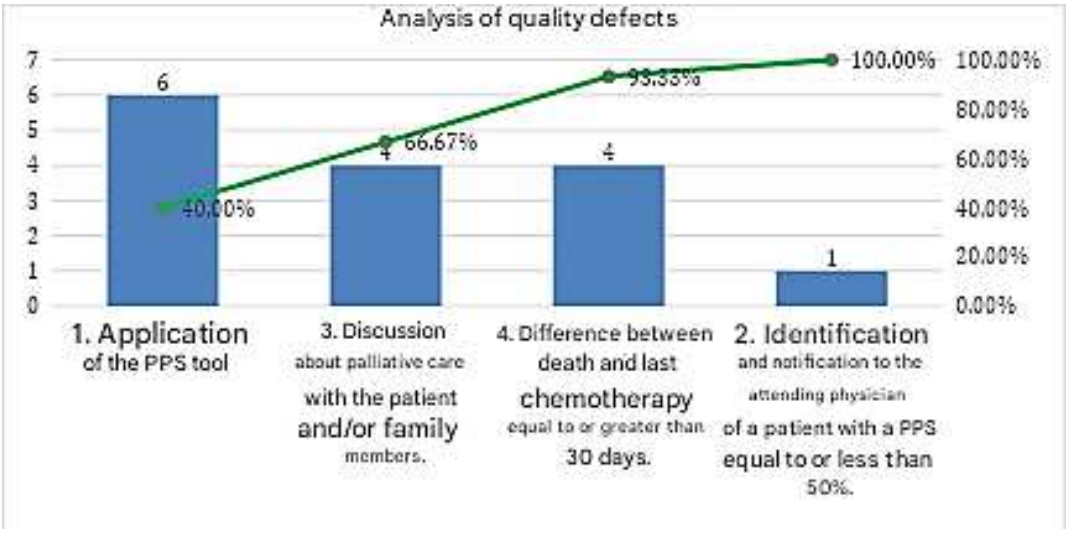
Criterion	Absolute frequency of nonconformities	Absolute frequency of nonconformities adjusted by rule of three
C1	01	01
C2	02	02
C3	02	02
C4	03	03
Total	08	08

Source: Research data, 2024

The before-and-after Pareto analysis of quality defects across the three evaluation periods is presented in Graph 3.

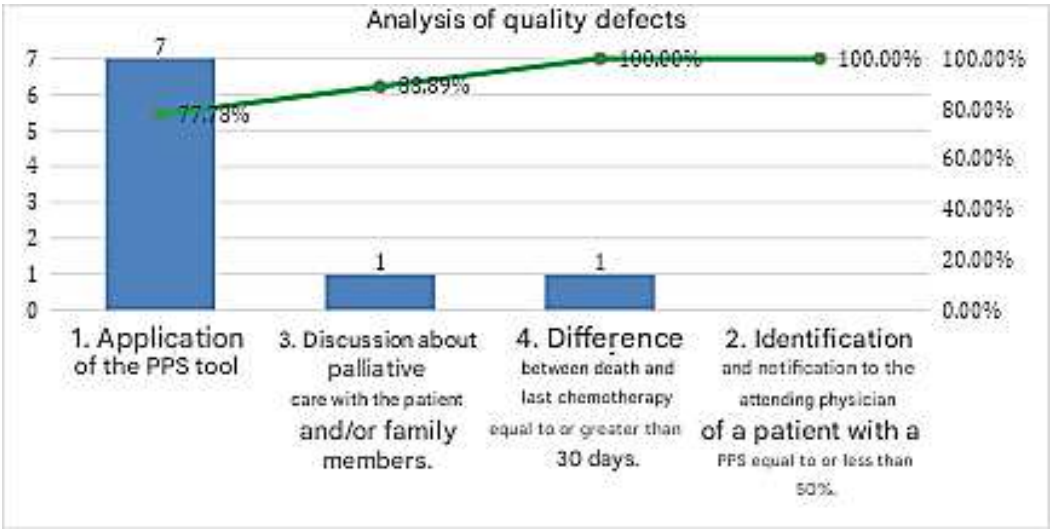
Graph 3 – Analysis of Quality Defects – Pareto Chart Before and After

Before – 1st evaluation:



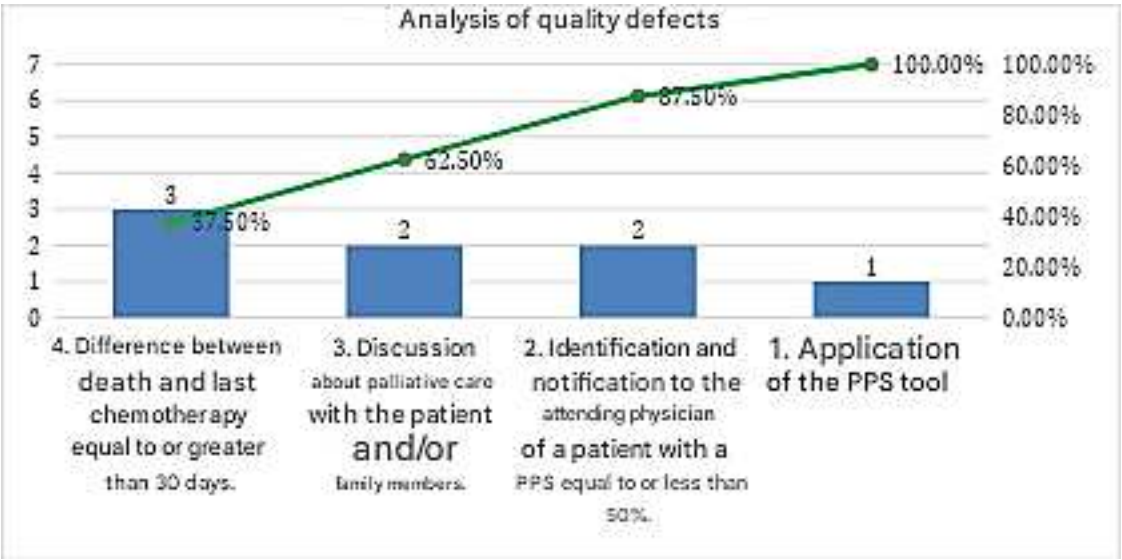
Source: Research data, 2024

After – 2nd evaluation:



Source: Research data, 2024

After – 3rd evaluation:



Source: Research data, 2024

When analyzing the data from the first and third evaluations, a reduction in nonconformities from 15 to 8 was identified, corresponding to a 46.7% decrease.

3.3. Current Status of Patients from the First Evaluation

When prescribing chemotherapy treatment, whether initial or ongoing, the attending physician defines the intended purpose of the treatment, which may be classified as curative, adjuvant, palliative, or disease control (for patients requiring continuous treatment without expectation of discontinuation or short-/medium-term decline).

The intersection between this purpose and the patient's palliative performance helps determine whether the chemotherapy treatment process remains beneficial for the patient.

Among the 301 patients from the first evaluation, as of March 30, 2024, it was identified that:

- 97 patients (32.6%) were undergoing treatment with a palliative intent. When combined with 28 patients (11.1%) receiving treatment for disease control without a prospect of cure, this represents 43.7% of the studied population;
- 10 patients (3.3%) died. Among these, 60% had an interval of more than 30 days between the last day of treatment and death;
- Of the 10 patients who died, nine had a last recorded PPS score above 50% in the system. The only patient with a PPS score equal to or lower than 50% had an interval of 322 days between the last day of treatment and death;

- Nine patients in this population were or are being followed by the Multidisciplinary Palliative Care Team

4. Discussion

In his study on quality management—specifically on the concept and components of a quality management program—argues that the improvement cycle is a fundamental activity in any healthcare organization related to quality management [14].

The same author further states that closing the improvement cycle involves verifying whether the planned and implemented interventions were successful or whether further analysis or monitoring is required to ensure that improvements are sustained over time.

Highlight that, when assessing patient functionality, the PPS scale helps identify clinical decline and that functional status is an independent predictor of survival, and should always be considered in care planning. This supports the understanding of the improvement team in this study that timely and properly conducted application of the scale facilitates the identification of patients who require prioritized palliative care interventions [9].

Criterion 1, related to the application of the PPS tool, showed a reduction in the absolute number of nonconformities and moved from first to last place in the third evaluation, demonstrating the effectiveness of the implemented interventions. At the beginning of the study, it was hypothesized that documentation was not being performed according to established guidelines, and that process changes and training interventions had a positive impact on the accuracy of PPS classification.

Also emphasize that defining prognosis in progressive and incurable diseases is essential for guiding treatment decisions and invasive procedures, and for supporting physicians in communicating care strategies to patients and families. This allows time for planning and reorganization of emotional, financial, and logistical aspects, reinforcing the importance of proper application of the PPS according to established processes [9].

Criterion 2 did not sustain the improvement observed between the second and third evaluations, nor did it demonstrate statistically significant improvement between the first and third evaluations. However, there was an improvement in the quality of communication following the implemented intervention. Initially, communication was conducted via WhatsApp and recorded in the system; it later evolved into structured discussions within multidisciplinary palliative care team meetings, including evaluation with the attending physician.

It was identified that, in some cases, documentation by the improvement team was recorded in parallel tracking spreadsheets rather than in the medical record, which may have influenced the

measured results. Additionally, heterogeneity was observed in team approaches depending on the physician, with some professionals being more receptive than others to palliative care discussions.

It is noted that decision-making processes in the health field are complex, involving probabilities of achieving desired results, potential adverse events, and the cultural perspectives, values, and preferences of patients and their families. Criterion 3, related to the documentation of doctor-patient/family discussions in the medical record, did not show improvement and had the fewest number of interventions implemented at the end of the study [4].

The literature explains that, although the concept of palliative care has evolved beyond end-of-life care, its practice remains limited. Effective implementation requires academic training that empowers healthcare professionals with the necessary competence and confidence to support end-of-life processes. Among the planned but unexecuted interventions are training and awareness-raising activities for physicians, which could help reduce this educational gap [3].

The initiative by the Multidisciplinary Palliative Care Team to invite attending physicians to jointly discuss patient cases and participate in patient and family communication may contribute to improved outcomes in future evaluations and help overcome barriers described by Freitas, who notes that referring patients with advanced cancer to palliative care can be complex and often results in delayed or absent referrals [1].

This collaborative approach is supported by Shimada and Ferrian, who state that interdisciplinary care between oncology and palliative care teams optimizes decision-making regarding antineoplastic therapy and helps align expectations and formalize patient preferences in advance, promoting patient-centered care at the end of life [18].

It is understood that improvement in Criterion 3 will occur gradually through cultural change, reinforcing the importance of the factors highlighted by these authors.

Criterion 4, a result indicator, refers to the interval between the last chemotherapy session and death. This criterion showed statistical relevance between the first and third evaluations. However, since the second evaluation, limitations in its analysis were identified:

- Possible underreporting of deaths, given the outpatient setting, where deaths occur at home or in hospitals and depend on family reporting;
- Inability to analyze causes of death occurring within less than 30 days, which may be unrelated to disease progression;
- Evaluation limited to a specific time period, including only patients undergoing treatment at that time.

Report that chemotherapy in advanced cancer is used not only to prevent disease progression but also to alleviate symptoms. However, its use is complex and requires careful evaluation of

clinical benefit versus potential adverse effects. Some studies indicate that 9% to 43% of patients with advanced disease receive chemotherapy in the last month of life, often without clear clinical benefit [18].

A more in-depth and longitudinal analysis of Criterion 4 is necessary, as current findings do not allow definitive conclusions regarding the sustainability of improvements. However, the follow-up of the 301 patients from the first evaluation over one year showed that more than 60% died with an interval of 30 days or more after the last chemotherapy session, and 43.7% were already receiving palliative-intent chemotherapy at baseline. This suggests that, as noted by Shimada and Ferrian, chemotherapy was maintained while clinically beneficial and discontinued when palliative care became the priority for preserving quality of life [18].

It should also be considered that PPS assessment occurs when the patient is present at the clinic. When treatment is discontinued or the patient's clinical condition deteriorates to the point of limiting mobility, preventing clinic attendance, the last recorded PPS score may become outdated near death. This limits comparison with findings from Moretti, Cechinel, and Espindola, who associate PPS ≤40% with an expected survival of less than 30 days [10].

It is important to note that achieving 100% discontinuation of chemotherapy more than 30 days before death is not expected, as there are cases in which continued treatment provides symptom control and improves quality of life.

This study allowed the evaluation of the impact of interventions implemented through a quality improvement cycle in the care of patients identified with PPS ≤50%. Based on the initial assessment of predefined quality criteria, improvement opportunities were identified, and the planning and implementation of interventions contributed to achieving the study's general and specific objectives.

One limitation of the study relates to causal variability in interpreting results concerning the time between treatment discontinuation and patient death.

Additionally, limited funding for a dedicated palliative care team resulted in gradual implementation of actions and restricted the number of patients who could benefit from the interventions. Nevertheless, process-related causes identified in the Ishikawa Diagram were addressed and led to positive outcomes.

5. Limitations

This study has some limitations that should be considered when interpreting its findings. First, the quasi-experimental before-and-after design without a control group limits causal inference, since the observed changes cannot be attributed exclusively to the implemented interventions. In

addition, the analysis of the interval between the last chemotherapy session and death is subject to causal variability, which makes the interpretation of this outcome more complex.

Second, the outpatient setting may have contributed to the underreporting of deaths, as deaths occurring at home or in other health services depended on communication from family members. This limitation may have affected the accuracy of Criterion 4, especially in cases where the date or cause of death could not be fully documented. Moreover, deaths occurring within less than 30 days after the last chemotherapy session could not be adequately interpreted, since some of these events may have resulted from causes unrelated to disease progression.

Third, the evaluation of outcomes was restricted to specific time periods and to patients who were actively undergoing treatment during those periods, which may have introduced selection bias. Furthermore, PPS assessment was performed when patients attended the clinic; therefore, in cases of treatment discontinuation or clinical deterioration that prevented attendance, the last recorded PPS score may not have accurately reflected the patient's functional status near death.

Another relevant limitation concerns the documentation process. In some cases, records related to communication and case follow-up were entered in parallel tracking spreadsheets rather than directly in the medical record, which may have influenced the measurement of compliance with some criteria. In addition, heterogeneity in physicians' receptiveness to palliative care discussions may have interfered with the consistency of the interventions and the observed results.

Finally, limited funding for a dedicated palliative care team resulted in the gradual implementation of some actions and restricted the number of patients who could benefit from the proposed interventions. Some planned actions, particularly those related to Criterion 3 and automated monitoring strategies, were not fully implemented during the study period. These aspects may have reduced the magnitude of the observed improvements and indicate the need for further evaluation with longer follow-up and broader implementation of the proposed actions.

6. Conclusion

This study demonstrated that multifaceted interventions analyzed through a quality improvement cycle can produce positive results in modifiable causes and proved to be effective for the continuous improvement of healthcare services. Through the application of this tool, several key insights were generated for healthcare teams: prioritization of opportunities based on objective criteria, identification and targeting of modifiable causes rather than structural ones, visualization of causal factors through the Ishikawa Diagram, versatility in the application of the tool across healthcare services, and optimization of management and decision-making processes.

Leadership engagement and the commitment of professionals involved in analyzing and implementing the proposed actions were essential, reinforcing that selecting improvement opportunities collaboratively within the team provides the necessary support for quality improvement initiatives.

The strategy of maintaining weekly meetings with the improvement team contributed to sustaining the process and ensuring its continuity, allowing for further cycles of improvement even after the conclusion of this study. Alongside awareness and training activities, these efforts have promoted a broader understanding among healthcare professionals regarding comprehensive palliative care in their daily practice.

Up to the completion of this study, no other private outpatient oncology institutions were identified as implementing an integrated approach to palliative care, which limited comparative analysis.

Different approaches and expectations regarding palliative care were identified among patients, healthcare teams, and family members, depending on their cultural and contextual backgrounds. Therefore, practices that are successful in other countries may not be directly applicable to the Brazilian Northeastern context, and vice versa. However, the study suggests that the use of the Improvement Cycle tool can be effective in other healthcare organizations, regardless of location or patient population, by supporting the identification and implementation of multifaceted actions targeting modifiable causes of improvement opportunities.

As a continuation of the improvement cycle studied, it is important to implement the suggested actions for Criterion 3 and conduct a new evaluation to assess their impact.

It is also necessary to develop strategies to reduce the underreporting of deaths and improve the availability of information regarding their causes. Follow-up of patients from the initial evaluation is recommended, with reassessment of Criterion 4 in the first quarter of 2025, completing two years of follow-up to allow for a more robust evaluation of outcomes.

Data Availability

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Funding statement

No financing

References

[1] Freitas R, Oliveira LC, Mendes QLQ, Lima FLT, Chaves GV. Barriers to referral for exclusive palliative care: oncologists' perceptions. Saude Debate. 2022;46(133):331-45.

[2] World Health Organization. Palliative care [Internet]. Geneva: World Health Organization; 2022 [cited 2026 Apr 23]. Available from: https://www.who.int/news-room/fact-sheets/detail/palliative-care

[3] Pereira EAL, Reys KZ. Concepts and principles. In: ANCP. Manual of palliative care. 3rd ed. São Paulo: Atheneu; 2021.

[4] Vidal EIO, Kovacs MJ, Silva JJ, Silva LM, Sacardo DP, Bersani ALF, et al. Position statement on shared decision-making in palliative care by ANCP and SBGG. Cad Saude Publica. 2022;38(9):e00130022.

[5] Castôr KS, Moura EC, Pereira EC, Alves DC, Ribeiro TS, Leal PC. Palliative care: epidemiological profile with a biopsychosocial perspective in oncology patients. Br J Pain. 2019;2(1):49-54.

[6] Brazil. Ministry of Health. Ordinance GM/MS No. 3,681, of May 7, 2024. Establishes the National Policy for Palliative Care within the Unified Health System. Brasília: Casa Civil; 2024.

[7] Alves RSF, Oliveira FFB. Palliative care for healthcare professionals: advances and challenges. Psicol Cienc Prof. 2022;42:e1-13.

[8] Victor GHG. Early palliative care. In: ANCP. Manual of palliative care. 3rd ed. São Paulo: Atheneu; 2021.

[9] Silva AMOP, Cortizo SAA. Patient assessment and prognostic indices. In: ANCP. Manual of palliative care. 3rd ed. São Paulo: Atheneu; 2021.

[10] Moretti RP, Cechinel C, Espindola R. Accuracy of survival prediction tools in elderly patients receiving home palliative care in Curitiba, Brazil. Geriatr Gerontol Aging. 2019;13:211-8.

[11] Saturno Hernández PJ. Quality management: concepts and components of a quality management program. In: Planning and implementation of quality management programs in healthcare services. Natal: SEDIS-UFRN; 2017.

[12] Institute of Medicine (US). Crossing the quality chasm: a new health system for the 21st century. Washington (DC): National Academies Press; 2001.

[13] Saturno Hernández PJ. Basic activities for continuous improvement: methods and tools for conducting the improvement cycle. Natal: SEDIS-UFRN; 2017.

[14] Saturno Hernández PJ. Documentation of achieved improvement: analysis and presentation of comparative results between evaluations. Natal: SEDIS-UFRN; 2017.

[15] Brazil. National Health Council. Resolution No. 466, of December 12, 2012. Brasília: National Health Council; 2012.
[16] Brazil. National Health Council. Resolution No. 510, of April 7, 2016. Brasília: National Health Council; 2016.
[17] Brazil. National Health Council. Resolution No. 466, of December 12, 2012. Establishes guidelines for research involving human beings. Brasília: National Health Council; 2012.
[18] Shimada AK, Ferrian AM. Chemotherapy. In: ANCP. Manual of palliative care. 3rd ed. São Paulo: Atheneu; 2021.
[19] Victoria Hospice Society. Palliative Performance Scale (PPS) version 2 [Internet]. [cited 2026 Apr 23]. Available from: https://victoriahospice.org/wp-content/uploads/2019/07/pps_-_portuguese_brazilian_-_sample.pdf