



CORRELATION BETWEEN QUALITY INDICATORS IN LONG-TERM CARE FACILITIES FOR OLDER ADULTS: IMPLEMENTATION STUDY

CORRELAÇÃO ENTRE INDICADORES DE QUALIDADE EM INSTITUIÇÃO DE LONGA PERMANÊNCIA PARA IDOSOS: ESTUDO DE IMPLEMENTAÇÃO

CORRELACIÓN ENTRE INDICADORES DE CALIDAD EN ESTABLECIMIENTOS DE LARGA ESTADÍA PARA ADULTOS MAYORES: ESTUDIO DE IMPLEMENTACIÓN

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RESUMO

Objetivo: Correlacionar indicadores de avaliação da qualidade em Instituições de Longa Permanência para Idosos. **Método:** Estudo de implementação, longitudinal, prospectivo realizado com ciclos de treinamento da equipe multidisciplinar e monitoramento mensal e/ou semestral de 21 indicadores, coletados em planilha em Excel durante um ano (maio/2023 e agosto/2024), discutidos em reunião mensal com a equipe, líder de pesquisa e bolsistas acadêmicos. Para análise foi aplicado o Teste de Spearman para correlações significativas ($p < 0,05$; $p < 0,10$). Estudo aprovado pelo Comitê de Ética em Pesquisa. **Resultados:** Análise longitudinal dos indicadores revelou padrões clínicos geriátricos consagrados na literatura e outros sazonais como: Mortalidade correlacionou-se com desnutrição (0,033); Diarreia com infecção urinária (0,010) Dor (0,032) ausência de visita dos familiares (0,002) pediculose (0,021); Desnutrição com Lesão por pressão (0,026); Infecção urinária com Dor (0,011); Constipação com infecção respiratória (0,026); Queda com funcionalidade (0,043) e Lesão por fricção (0,095; $p < 0,10$); Funcionalidade com Cuidados bucais (0,029); Dor com ausência de visita familiares (0,026) Pediculose (0,010). **Conclusão:** Esse estudo recomenda a ampliação dos indicadores como estratégia para qualificar a avaliação da assistência prestada nas Instituições de Longa Permanência para Idosos a fim de identificar fragilidades, reconhecer boas práticas e alocar eficientemente os recursos.

Descritores: Instituições de Longa Permanência para Idosos; Enfermagem Geriátrica; Saúde do Idoso; Serviços de Saúde para Idosos; Indicadores de Qualidade.

ABSTRACT

Objective: To correlate quality assessment indicators in Long-Term Care Facilities for Older Adults. **Method:** Longitudinal, prospective implementation study conducted through training cycles for the multidisciplinary team and monthly and/or semiannual monitoring of 21 indicators, collected in an Excel spreadsheet over one year (May 2023 to August 2024) and discussed in monthly meetings with the team, the research leader, and academic fellows. Spearman's test was applied to identify significant correlations ($p < 0.05$; $p < 0.10$). The study was approved by the Research Ethics Committee. **Results:** Longitudinal analysis of the indicators revealed geriatric clinical patterns well established in the literature and others that were seasonal, such as: mortality was correlated with malnutrition (0.033); diarrhea with urinary tract infection (0.010), pain (0.032), absence of family visits (0.002), and pediculosis (0.021); malnutrition with pressure injury (0.026); urinary tract infection with pain (0.011); constipation with respiratory infection (0.026); falls with functionality (0.043) and friction injury (0.095; $p < 0.10$); functionality with oral care (0.029); pain with absence of family visits (0.026) and pediculosis (0.010). **Conclusion:** This study recommends expanding the indicators as a strategy to qualify the assessment of care provided in Long-Term Care Facilities for Older Adults in order to identify weaknesses, recognize good practices, and efficiently allocate resources.

Descriptors: Homes for the Aged; Geriatric Nursing; Health of the Elderly; Health Services for the Aged; Quality Indicators.

RESUMEN

Objetivo: Correlacionar indicadores de calidad mediante la evaluación multiprofesional de personas mayores residentes en Instituciones de Larga Estancia para Personas Mayores. **Método:** Estudio de implementación, longitudinal y prospectivo, llevado a cabo mediante ciclos de formación del equipo multidisciplinar y un seguimiento mensual y/o semestral de 21 indicadores, recopilados en una hoja de cálculo de Excel durante un año (mayo de 2023 y agosto de 2024), que se analizaron en reuniones mensuales con el equipo, el responsable de la investigación y los becarios académicos. Para el análisis se aplicó la prueba de Spearman para detectar correlaciones significativas ($p < 0,05$; $p < 0,10$). Estudio aprobado por el Comité de Ética en Investigación. **Resultados:** El análisis longitudinal de los indicadores reveló patrones clínicos geriátricos bien establecidos en la literatura y otros de carácter estacional, tales como: la mortalidad se correlacionó con la desnutrición (0,033); la diarrea con la infección urinaria (0,010); el dolor (0,032); la ausencia de visitas de familiares (0,002); y la pediculosis (0,021); la desnutrición con las úlceras por presión (0,026); Infección urinaria con dolor (0,011); Estreñimiento con infección respiratoria (0,026); Caída con funcionalidad (0,043) y Lesión por fricción (0,095; $p < 0,10$); Funcionalidad con cuidados bucales (0,029); Dolor con ausencia de visitas familiares (0,026); Pediculosis (0,010). **Conclusión:** Este estudio recomienda ampliar los indicadores como estrategia para mejorar la evaluación de la asistencia prestada en los centros de larga estancia para personas mayores, con el fin de identificar puntos débiles, reconocer las buenas prácticas y asignar los recursos de manera eficiente.

Descriptores: Hogares para Ancianos; Enfermería Geriátrica; Salud del Anciano; Servicios de Salud para Ancianos; Indicadores de Calidad.

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What is already known:

- Long-Term Care Facilities for older adults have expanded as hybrid social and health services, with health and social needs.
- In Brazil, ANVISA's Resolution (RDC) No. 502/2021 establishes a minimum set of six (6) mandatory indicators.
- The literature indicates that regulatory indicators are insufficient to capture the complexity of geriatric care, thereby demanding multidimensional and multiprofessional approaches.

What this article adds:

- This study implements and monitors 15 new quality indicators sensitive to geriatrics and gerontology.
- The use of a training program based on Plan–Do–Check–Act cycles proved relevant for implementing the indicators.
- Correlations were found among the indicators, revealing the multicomplicity and intersections of gerontological care.

INTRODUCTION

The pursuit of continuous quality improvement in Long-Term Care Facilities for Older Adults (LTCFs) drives the consolidation of safe care practices centered on the older person⁽¹⁾. This process involves the systematic evaluation, planning, and implementation of actions aimed at care standards and the promotion of care outcomes⁽²⁾. In this context, quality assessment is mediated by indicators that measure institutional performance and guide the decision-making process, supporting evidence-based management.

Long-Term Care Facilities for Older Adults (LTCFs) are residential services intended for people aged 60 years or older who require continuous care, multiprofessional follow-up, and health support⁽³⁾. In Brazil, their origin goes back to the welfare and philanthropic model, such as charity houses. With the advance of population aging and public policies aimed at older people, these institutions have undergone an important normative and conceptual transformation, incorporating principles of dignity, autonomy, promotion of functionality, and patient safety^(4,5).

The sanitary regulation was initially consolidated by Collegiate Board Resolution (RDC) No. 283 and later updated by Collegiate Board Resolution (RDC) No. 502 of the National Health Surveillance Agency (ANVISA), which established structural, organizational, and monitoring requirements for six indicators that must be monitored in LTCFs: mortality rate, incidence of diarrheal diseases, incidence of scabies, incidence of dehydration, prevalence of pressure injuries, and prevalence of malnutrition⁽³⁾.

These parameters constitute the minimum monitoring, but their scope is restricted given the complexity of geriatric care, making the incorporation of functional, emotional, and social aspects of aging imperative. The literature indicates that regulatory indicators are insufficient to capture the complexity of geriatric and gerontological care and, holistically, the multidimensional and multiprofessional aspects involved⁽⁶⁻⁸⁾.

Given that the prevalence of chronic diseases, functional limitations, and the growing demand for gerontological care are among the main challenges associated with aging, which are compounded in contexts of social vulnerability, lack of family support, and high functional dependence, integrated responses from health and social assistance systems are required⁽⁹⁻¹⁰⁾.

In this scenario, LTCFs take a leading role by offering continuous care aimed at promoting the dignity and quality

of life of residents. However, differences between Brazilian regions regarding structural inequalities, the shortage of qualified professionals, and accessibility limitations jeopardize the quality of services in LTCFs in Brazil⁽¹¹⁾. This reinforces the need for implementation studies that reveal the importance of monitoring multidimensional indicators and their correlations with care.

Therefore, the objective of this study was defined as: to correlate quality assessment indicators in Long-Term Care Facilities for Older Adults. Thus, the goal is to strengthen multidimensional indicators, create self-assessment tools applicable to the institutional reality of long-term care, coupled with continuous professional training and the refinement of indicator-based monitoring systems that guide decision-making and promote the improvement of care quality. This seeks to support an expanded approach to the quality of care, integrating physical, emotional, and social aspects of aging.

METHOD

This is a longitudinal, prospective implementation study, following the guidelines of SQUIRE 2.0 (Standards for Quality Improvement Reporting Excellence).

Context

The study was conducted in a Long-Term Care Facility for Older Adults located in Niterói, with 24 years of contribution to dignified aging through attentive care, from May 2023 to August 2024. This LTCF participates as a collaborating institution in the ILPI Escola Extension Project within the theoretical-practical training field for undergraduate education and the Multiprofessional Residency in Older Adult Health at Fluminense Federal University (UFF).

The institution has 40 places, with a varying occupancy rate, currently having 28 residents, and varying degrees of complexity, which demands a multidisciplinary approach to care. For this study, 26 older people institutionalized for at least three months were initially included to ensure greater stability in health conditions and consistency in the data collected, despite variability due to mortality and admission rates. The institution's multidisciplinary team was integrated and participated in the implementation of the research: 2 physicians, 2 nurses, 2 physical therapists, 2 nutritionists, 2 psychologists, and 5 residents and interns in medicine and nursing, who collected and monitored the

indicators defined by the study⁽¹²⁾.

Intervention

The implementation was an Extension Program of Fluminense Federal University called ILPI-Escola, based on

the Plan-Do-Check-Act (PDCA) model, where continuous cycles of planning, execution, analysis, and adjustments promote the progressive improvement of care and of the measurement of indicators^(13,14), as shown in Table 1.

Table 1 – Practical application of the PDCA cycle for the implementation of quality improvement in the LTCF. Niterói, RJ, Brazil, 2025

PDCA STAGE	PRACTICAL APPLICATION
Plan	A situational diagnosis of the LTCF was carried out, identifying the main frailties related to monitoring residents' health and the absence of systematized indicators. Based on this analysis, 21 health indicators were selected, developed from scientific evidence and adjusted to the specific needs of the institutionalized population. Performance goals, those responsible for collection, and the monitoring periodicity were then defined.
Do	The proposed indicators were implemented in the institution's routine, ensuring the standardization of records and the team's understanding of the evaluation criteria. Data recording and initial monitoring of results began.
Check	An analysis of the results obtained from the applied indicators was performed, which allowed for the identification of advances, gaps, and non-conformities, in addition to verifying the adequacy of the instruments and the team's adherence to the new practices.
Act	Based on the information analyzed, indicators and processes were adjusted, standardizing consolidated improvements and reinforcing actions that demonstrated effectiveness. The aim was to ensure the sustainability of changes and foster a culture of continuous improvement in the institution.

Source: prepared by the authors, 2025.

Each cycle included the participation of the research team and the institution, using comparative data monitoring before, during, and after the interventions as the main instrument to verify changes recorded and discussed in monthly meetings. The multidisciplinary team continuously reviewed the data and made necessary adjustments, maintaining a feedback cycle based on the PDCA, useful for validating the effectiveness of the interventions and confirming their relationship with the improvement of care quality and residents' health.

The multidisciplinary team acted in the application and monitoring of the indicators, with a monthly meeting for presentation and discussion, according to their competencies: nutritionists monitored malnutrition, dehydration, and food consistency; physical therapists monitored falls and functionality; nurses monitored injuries and restraint; doctors monitored pain, infections, medication review, deprescribing, and behavioral changes; the dentist monitored oral health; the psychologist monitored family absence and participation in activities. This integrated and multidimensional approach enabled systematic and adapted intervention to the specific needs of the residents.

Team training

Data reliability was guaranteed by standardizing data collection procedures and training the multidisciplinary team in 4 two-hour sessions, systematically organized to ensure uniformity in indicator measurement^(9,12,13). The analysis was based on the triangulation of quantitative and qualitative data, covering environmental variables, communication between the team, staff turnover, resident

adherence, and their influence on the observed results^(14,15).

To ensure the continuous capture and interpretation of barriers and facilitators throughout the intervention, a participatory monitoring model was adopted. Regular meetings with the multidisciplinary team allowed for tracking the evolution of indicators, raising emerging difficulties, and identifying necessary adaptations. Contextual changes such as seasonality, alteration in resident profiles, or staff turnover were documented and incorporated into the analysis for better interpretation of results. Internal tracking and audit systems were also implemented, with cyclical data review at each intervention stage^(10,16,17).

Measurements

This study advances by evaluating 15 other indicators: urinary tract infection, constipation, falls, functionality, cognition, friction injury, medication deprescribing, change in food consistency, behavioral changes, respiratory tract infections, pain, oral care, absence of family visits, non-participation in activities, and pediculosis. These indicators were chosen through a systematic literature review and team discussion, and are described in the Practical Guide for Measuring Indicators with instructional *checklists* for the multiprofessional team, which is included as **supplementary material** to this article and described in Table 2.

Measurements were carried out daily by the care team and weekly by the research team, and the integrated discussion of cases for inclusion in the spreadsheet took place monthly. Three (3) indicators were exceptions and were assessed semiannually, or depending on changes in the older person's clinical and social condition.

Table 2 – Conceptual and operational definition of quality improvement measures. Niterói, RJ, Brazil, 2025

No.	INDICATOR	CONCEPTUAL DEFINITION	OPERATIONAL DEFINITION	REFERENCES
1	MORTALITY*	Number of deaths among institutionalized older adults in the institution.	Number of deaths that occurred and were recorded in the medical record with the cause of death and circumstances.	(3,7,11,16,17)
2	ACUTE DIARRHEAL DISEASE*	Syndrome caused by various etiological agents whose predominant manifestation is an increased number of bowel movements, with watery or loose stools. It is frequently accompanied by vomiting, fever, and abdominal pain.	Number of older adults with a patient record entry, including the number of episodes and appearance, and the relation to medications and/or clinical condition.	(3,18,19)
3	SCABIES*	Skin parasitosis caused by a mite whose penetration causes lesions in the form of vesicles, papules, or small burrows, where eggs are deposited.	Number of older adults with a patient record entry and initiation of measures to prevent transmission to other institutionalized older adults.	(3)
4	DEHYDRATION*	Insufficient body fluids to maintain normal functions at an adequate level; deficiency of body water and electrolytes with losses exceeding intake.	Number of older adults with a laboratory blood urea-creatinine test >20 mg/dL; visual assessment of the tongue and dryness of the mucous membranes; poor skin turgor. Presentation of 2 of these symptoms: dry mucous membranes, constipation, hypotension, swollen tongue, sunken eyes, and chronic infection. An episode of dehydration is considered when: a hospitalization for dehydration, an on-site administration of intravenous fluids for dehydration, or BUN/creatinine >25:1.	(3,16,19)
5	PRESSURE INJURY*	Localized damage to the skin and/or underlying soft tissue, usually over a bony prominence or due to the use of medical devices. The injury may present on intact skin or as an open injury, and may be painful. It results from intense and/or prolonged pressure or from pressure combined with shear.	Number of institutionalized older adults with an identified pressure injury, with risk assessed using the Braden Scale, recording of the injury category, measurement of size (length, width, and depth), type of dressing used, and assessment of nutritional status, with reassessment of partial-thickness injuries within two weeks, according to medical record documentation.	(3,19,20,21)
6	MALNUTRITION*	Condition caused by inadequate intake or digestion of nutrients, resulting from an unbalanced diet, digestive problems, absorption problems, or similar problems.	Number of institutionalized older adults assessed for nutritional status, with recording of body weight and identification of reduced oral intake, documentation of weight loss, presence of associated comorbid conditions, investigation of potentially reversible causes, and consideration of alternatives to oral feeding (enteral tube or gastrostomy) when indicated. Nutritional assessment should be performed using the Mini Nutritional Assessment (MNA), calf circumference, skinfolds, and bioimpedance, when available, as well as serum protein measurement in severe cases, according to medical record documentation.	(3,19,20,21)
7	URINARY TRACT INFECTION	Bacterial infection that affects the bladder and associated structures, being the most common cause of hospitalization among older adults. It may be caused by incorrect intimate hygiene, low water intake, diabetes, and constipation.	Number of clinical diagnoses of urinary tract infection confirmed by symptoms (dysuria, fever, behavioral change) and/or laboratory tests in the medical record; urinalysis and urine culture.	(22)
8	CONSTIPATION	Symptom characterized by: hardened stools, irregular bowel movements, need for excessive straining to evacuate, a persistent attempt to evacuate for an excessive time, or resulting in little stool production.	Number of institutionalized older adults with records of intestinal constipation in the medical record by the nursing team, characterized by reports from caregivers or the resident of absence of evacuation for a prolonged period, hardened stools, straining, as well as identification of a palpable fecal mass during clinical assessment, according to care documentation.	(19,23)
9	FALL	Unintentional displacement of the body to a lower level than the initial position, caused by multifactorial circumstances, resulting or not in harm.	Number of falls among institutionalized older adults in a given period, with or without physical consequences, recorded in the medical record as an adverse event, with opening and follow-up of the institutional protocol for fall prevention and management, according to care documentation.	(24)

No.	INDICATOR	CONCEPTUAL DEFINITION	OPERATIONAL DEFINITION	REFERENCES
10	FUNCTIONALITY	Encompasses all body functions, activities, and participation, indicating the positive aspects or facilitators of the interaction between an individual and their contextual factors.	Semiannual assessment of the loss or maintenance of functionality of institutionalized older adults using standardized scales, including the Barthel Index, the Timed Up and Go test, and handgrip strength measurement, with results recorded in the medical record to monitor functional capacity over time.	(16,24,25)
11	COGNITION	Ability to perceive, integrate, understand, and respond appropriately to all stimuli in the environment in which a person is inserted.	Semiannual assessment of institutionalized older adults for loss or maintenance of cognition using scales (MMSE and CDR for those not applicable) and early detection of neurocognitive deficits.	(9,13)
12	FRICTION INJURY	Common skin wound in individuals at the extremes of age, characterized by the presence of a skin flap that may be epidermal, when trauma separates the epidermis from the dermis, or dermoepidermal, when trauma separates the dermis and epidermis from adjacent structures. Its main causes are shearing, friction, and blunt trauma.	Number of friction injuries identified among institutionalized older adults, classified by severity and risk, assessed using a standardized scale (STAR – Skin Tear Audit Research), with recording in the medical record for monitoring and follow-up of the injuries.	(26,27)
13	MEDICATION DEPRESCRIBING	Discontinuation of the prescription of certain medications based on the risk-benefit assessment of each drug to minimize polypharmacy and, consequently, the health risks it may cause.	Number of medications discontinued based on the assessment of risks and benefits, avoiding polypharmacy.	(28,29)
14	CHANGE IN FOOD CONSISTENCY	Change in the consistency of the diet (pureed, liquid, ground), due to nutritional, medical, or speech-language indication in response to the need to address swallowing difficulties, dysphagia, digestive problems, or other neurocognitive conditions that affect eating behavior.	Number of institutionalized older adults who had changes in the texture and consistency of food.	(20,25)
15	BEHAVIORAL CHANGES	Change in usual behavior with mood alterations, expressing apathy, aggressiveness, and/or agitation.	Number of institutionalized older adults with episodes of behavioral changes identified in assessment by the multiprofessional team, measured using the Neuropsychiatric Inventory (NPI), with recording in the medical record to monitor the frequency and severity of symptoms.	(9,30,31)
16	RESPIRATORY TRACT INFECTIONS	Infections that cause obstruction of airflow, affecting the upper and/or lower respiratory tract, being among the main causes of morbidity and mortality worldwide.	Number of diagnoses of respiratory infections (upper or lower airways), with clinical confirmation.	(16,32)
17	PAIN	A sensory and emotional experience associated with actual or potential tissue damage.	Number of institutionalized older adults with pain identified in regular assessments using standardized pain scales: VAS and/or the Pain Assessment in Advanced Dementia (PAINAD) scale.	(9,10,11)
18	ORAL CARE	Dentist's visit to the resident, as requested by the family or by the multidisciplinary team.	Semiannual assessment carried out with oral care actions: supervised brushing, use of appropriate dentures, use of adapted techniques.	(19,33)
19	ABSENCE OF FAMILY VISITS	Control of visits to institutionalized older adults, both for follow-up and for the older adult's socialization.	Number of institutionalized older adults who did not receive visits in the month according to visitor entry and exit control records.	(15,34)
20	NON-PARTICIPATION IN ACTIVITIES	Means of analyzing the older adult's participation in the activities proposed by the entire team, regulating their socialization and the levels of complexity and progression of the disease.	Number of institutionalized older adults who did not participate in any of the activities scheduled in the month, correlating with degree of dependence or lack of interest, even after personalized adaptation of the activity.	(1,13)
21	PEDICULOSIS	Infestation caused by the hematophagous ectoparasite <i>Pediculus humanus capitis</i> , located mainly on the scalp. It causes local itchy lesions and may lead to complications such as bacterial infections, mycoses, and myiasis if not treated properly.	Number of diagnosed cases of pediculosis among institutionalized older adults.	(35)

*Anvisa RDC 502 Indicator.

Source: prepared by the authors, 2025.

Indicator analysis

The information was integrated into a continuous improvement spreadsheet, allowing for the correlation of results and the identification of factors that influenced the effectiveness of the actions⁽¹⁴⁾. A longitudinal approach was adopted, with data collection over multiple periods to assess temporal variations and to distinguish the effects of the intervention from contextual or seasonal factors^(9,10). The indicators were monitored in monthly and semiannual cycles over one year, identifying trends and patterns⁽¹⁶⁾. Spearman's test was used, which is suitable for ordinal or continuous variables without normality, converting the data into ranks and generating a correlation coefficient (r) between -1, perfect negative correlation (an increase in one variable associated with a decrease in the other), and +1, perfect positive correlation (a simultaneous increase in both variables). It should be noted that correlation does not imply a causal relationship between the variables⁽⁹⁾.

Significance levels of 5% and 10% were adopted ($p < 0.05$; $p < 0.10$), and a correlation was considered statistically significant when the p -value was below these thresholds.

Ethical considerations

The study was approved by the institution's Research Ethics Committee (REC) under opinion number 7,202,873, CAAE: 81010724.8.0000.8160, ensuring compliance with the ethical principles of Resolution No. 466/2012 of the National Health Council (NHC). The participants or their legal representatives provided informed consent. Furthermore, the anonymity of the residents and the confidentiality of the collected data were guaranteed.

RESULTS

Table 3 presents the main characteristics of the profile of institutionalized older adults.

Table 3 – Profile of institutionalized older adults. Niterói, RJ, Brazil, 2025

Variable		n	%
Sex	F	21	80.77
	M	5	19.23
Age	70-80	8	30.77
	81-90	10	38.46
	91-100	8	30.77
Main medical diagnosis – reason for institutionalization	Dementia	23	88.47
	Psychiatric disorder	3	11.53
Length of institutionalization	1 year	7	26.93
	2 a 3 years	6	23.07
	4 a 5 years	6	23.07
	6 a 7 years	3	11.53
	8 a 9 years	2	7.68
	10 years	1	3.84
	17 years	1	3.84
Degree of dependence	I	3	11.53
	II	14	53.84
	III	9	34.63
Age - Mean		85.8 (71-100)	
Length of institutionalization – Mean		4.19 (1-17 years)	

Source: prepared by the authors, 2025.

A predominantly female profile was observed among the older adult population, with a considerable number of very old individuals, as evidenced by the mean age (85.8 years). The main diagnosis was dementia syndrome, with wide variation in the length of institutionalization; however, as expected, most residents had been institutionalized for between 1 and 5 years, with a mean duration of 4.19 years. Regarding the degree of dependence, most residents (88.47%, grouped within levels II and III) depended on assistance for activities of daily living, especially bathing and self-care.

Table 4 shows the correlations among the measured indicators, highlighting the complexity of care, since older adults often present associated clinical conditions and re-

quire multidimensional geriatric assessment in long-term care facilities. Furthermore, older adults who have resided in the institution for extended periods require systematic follow-up. Significant correlations at the 0.05 level (two-tailed) are highlighted in gray, whereas significant correlations at the 0.10 level (two-tailed) are highlighted in orange. It should be noted that indicators Q10 (functionality) and Q11 (cognition) yielded the same results among the older adults and were grouped because they help classify dependence levels I, II, and III. Likewise, indicators Q19 (absence of family visits) and Q20 (non-participation in activities) were found in this first study to occur in the same older adults, and in the most dependent ones, and were therefore grouped.

Table 4 – Spearman correlation between indicators. Niterói, RJ, Brazil, 2025

			Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10/11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19/20	Q21
Mortality	Q1	Correlation	-0.110	.597*	-.553*	-0.184	-0.351	0.065	-0.049	0.010	-0.187	0.085	0.400	0.192	0.176	-0.145	0.228	0.209	0.033	0.423
		p-value	0.696	0.019	0.033	0.511	0.200	0.818	0.863	0.973	0.506	0.763	0.140	0.492	0.530	0.605	0.414	0.454	0.907	0.116
Acute diarrheal illness	Q2	Correlation		-0.421	-0.166	-0.288	-0.031	.639*	-0.368	0.081	0.052	0.266	-0.037	-0.064	0.143	0.053	.555*	0.064	.740*	.589*
		p-value		0.118	0.555	0.298	0.914	0.010	0.177	0.775	0.855	0.338	0.896	0.822	0.610	0.852	0.032	0.821	0.002	0.021
Scabies	Q3	Correlation			-0.382	-0.105	-0.121	-0.203	0.046	-0.033	-0.270	-0.109	0.498	0.184	0.009	0.080	-0.203	0.158	-0.421	-0.194
		p-value			0.160	0.711	0.667	0.468	0.871	0.906	0.331	0.700	0.059	0.511	0.974	0.777	0.468	0.574	0.118	0.488
Malnutrition	Q4	Correlation				0.326	.571*	-0.147	0.279	0.274	0.409	-0.096	-0.502	0.033	0.162	-0.004	-0.350	-0.209	0.041	-0.485
		p-value				0.235	0.026	0.601	0.314	0.322	0.130	0.733	0.056	0.907	0.563	0.989	0.200	0.456	0.885	0.067
Dehydration	Q5	Correlation					0.186	-0.316	-0.236	-0.124	-0.184	-0.371	-0.235	0.279	-0.186	-0.315	-0.315	-0.184	-0.288	-0.133
		p-value					0.506	0.252	0.397	0.659	0.511	0.173	0.399	0.313	0.507	0.253	0.252	0.511	0.298	0.637
Pressure injury	Q6	Correlation						0.102	0.312	-0.294	0.071	0.239	-0.099	0.201	0.119	-0.007	-0.284	0.028	-0.110	-0.422
		p-value						0.716	0.258	0.288	0.803	0.392	0.725	0.474	0.673	0.979	0.304	0.922	0.695	0.117
Urinary infection	Q7	Correlation							-0.191	0.057	-0.049	-0.042	0.346	-0.235	0.099	0.349	.633*	0.305	0.408	0.444
		p-value							0.496	0.841	0.863	0.882	0.206	0.400	0.727	0.203	0.011	0.269	0.131	0.097
Constipation	Q8	Correlation								-0.170	0.230	0.082	-0.219	-0.180	0.247	.572*	-0.345	0.028	-0.249	-0.438
		p-value								0.545	0.410	0.772	0.434	0.521	0.375	0.026	0.208	0.922	0.370	0.103
Fall	Q9	Correlation									.528*	-0.447	-0.281	0.143	0.149	-0.110	0.265	0.189	0.411	0.133
		p-value									0.043	0.095	0.310	0.612	0.595	0.697	0.340	0.500	0.128	0.636
Functionality / cognition / dependence level	Q10/	Correlation									0.196	-0.191	0.147	0.180	-0.033	0.177	.564*	0.314	0.205	
Friction injury	Q11	p-value									0.484	0.496	0.602	0.520	0.908	0.528	0.029	0.255	0.463	
	Q12	Correlation										0.142	0.044	0.047	-0.142	0.013	0.183	0.325	0.222	
		p-value										0.615	0.875	0.869	0.614	0.964	0.514	0.237	0.426	
Medications / deprescribing	Q13	Correlation											0.235	-0.095	0.190	0.121	0.268	-0.324	0.198	
		p-value											0.398	0.736	0.499	0.669	0.335	0.239	0.479	
Consistency change	Q14	Correlation												0.147	-0.370	-0.088	0.060	-0.076	0.003	
		p-value												0.175	0.754	0.832	0.787	0.992	0.992	
Behavioral changes	Q15	Correlation												-0.102	0.412	-0.052	0.264	0.058	0.058	
		p-value													0.717	0.127	0.853	0.342	0.838	
Respiratory infection	Q16	Correlation															-0.143	0.054	-0.128	-0.213
		p-value															0.612	0.848	0.650	0.446
Pain	Q17	Correlation																.478	.570*	.640*
		p-value																0.072	0.026	0.010
Oral care (visit every 6 months)	Q18	Correlation																0.202	0.421	0.202
		p-value																0.470	0.118	.583*
Absence of family visits / Non-participation in activities	Q19	Correlation																		0.022
	Q20	p-value																		-
Pediculosis	Q21	Correlation																		-
		p-value																		-

The gray color indicates that the correlation is significant at the 0.05 level (two-sided).

The orange color indicates that the correlation is significant at the 0.10 level (two-sided).

Source: prepared by the authors, 2025.

DISCUSSION

The main finding of this study is the expansion of indicators for assessing the care provided to older adults residing in LTCFs, such as the standardization of processes and conceptual and operational definitions. This is added to the correlation data obtained among the indicators, which reveal the possibility of one indicator influencing another, and the cascade effect, that is, the multicomplexity of gerontological care.

Therefore, preventive monitoring of risks associated with older adults' health in a multidimensional manner and the promotion of transparency in institutional management are required. For this purpose, the inclusion of new indicators contributes to a comprehensive assessment of residents' well-being, helping to identify areas that need improvement.

The indicators proposed by professionals and selected on the basis of scientific evidence made it possible to identify variables that affect the quality of life of institutionalized older adults and that can be replicated. However, challenges must be overcome for implementing these indicators in LTCFs, such as limited resources, lack of team training, and the need for material resources to carry out the necessary interventions^(16,17).

Systematic monitoring supported an action plan relevant to expanded clinical practice, focused on the older person. This structure serves as a guide for training, implementation of comprehensive care plans, and team discussions^(12,14). The use of validated tools and protocols based on international guidelines is recommended to ensure a reliable assessment of physical, mental, and social health^(9,10,13). The literature confirms that a multidisciplinary approach and the active participation of professionals ensure personalized and effective interventions⁽¹²⁾.

Specifically, the mortality indicator showed a significant positive correlation with acute diarrheal disease, which may indicate more severe infections with fatal outcomes⁽¹⁸⁾. For its part, the malnutrition indicator showed a positive association with pressure injury, a well-established finding in the literature that demonstrates the relationship between nutritional deficit and skin integrity^(19,20). This data presented as a team facilitates the discussion of nutritional, clinical, and nursing practices.

There was also an association between the constipation indicators and the change in dietary consistency, suggesting that dietary alterations influence intestinal transit. Loss of appetite and feeding difficulties associated with injuries require the joint evaluation of these indicators to increase sensitivity and foresee damage early. The coexistence of malnutrition and sarcopenia is a stronger predictor of all-cause mortality than sarcopenia alone⁽³⁶⁾. And, in institutionalized older adults, malnutrition can be an early marker of sarcopenia, and nutritional interventions and physical exercise can mitigate these risks, reducing mortality.

Constipation also showed a correlation with behavioral changes, which corroborates the literature in geriatrics indicating that abdominal discomfort, sedentary lifestyle, and low fiber intake can negatively impact mood and behavior, being possible triggers for other clinical conditions. Or even in older adults with dementia unable to communicate, this can be an alert sign for seeking clinical conditions. This reinforces the need for continuous multidimensional assessment of institutionalized older adults, focusing on physical signs and subtle behavioral changes⁽²³⁾.

A significant correlation was identified between the fall indicators and functional impairment. This correlation may be influenced by advanced dementia, and this finding reinforces the need for interventions that promote

the maintenance of mobility and functional autonomy in institutionalized older adults^(19,24,25).

In the dimension of pain and physical suffering indicators, pain correlated with inadequate oral care and absence of family visits. These findings highlight the relationship between suffering and psychosocial aspects, such as social isolation, reinforcing the importance of family presence as a therapeutic component⁽³⁷⁾. The correlation between pain indicators and the absence of family visits suggests that pain can limit social interaction, hindering interactions, and that the lack of family support can intensify the perception of pain⁽³⁴⁾. Regarding oral care, it was related to pain in the frailty of older adults who could not feed themselves due to dysphagia.

Additionally, the correlation between pain and inadequate oral care was related to the greater frailty of older adults, especially among those with dysphagia and total dependence for oral hygiene, a condition that compromises feeding, aggravates physical discomfort, and contributes to the persistence of pain⁽³³⁾. These findings reinforce the importance of integrated approaches, which simultaneously consider clinical, functional, and psychosocial aspects in the care of the institutionalized older person.

The indicator for the absence of family visits also correlated with the occurrence of pediculosis, which, when analyzing older adults, concerns the most frail, and in these cases, family support is needed to maintain bonds and support end-of-life care, and therefore, they have low immunity and are more susceptible to pediculosis⁽³⁵⁾.

The urinary tract infection indicator showed a significant correlation with behavioral changes, acute diarrheal diseases, and pain. This indicates that infections in older adults can manifest atypically, with symptoms such as agitation, delirium, and mental confusion, associated with geriatric syndromes, in addition to the discomfort derived from inflammation in the urinary tract, which can intensify behavioral changes and increase the risks of complications.

The fall and skin tear indicators showed a significant correlation at 0.10. The occurrence of falls frequently results in skin injuries, among which skin tears stand out. These injuries are particularly more frequent in older adults due to the physiological changes of skin aging, such as reduced elasticity, decreased dermal thickness, and greater capillary fragility⁽²⁷⁾, and require prevention measures involving the entire care team.

However, it should be noted that the implementation model using the Plan-Do-Check-Act (PDCA) cycle made it possible to base the work on iterative cycles of planning, execution, evaluation, and adjustment, confirming it as an applicable approach. The design of collaborative and multidisciplinary actions for the indicators was effective for the specificity of the indicators and for building personalized action plans appropriate to each context; the meetings were the moments to discuss the indicator data and the interventions, outlining the theoretical-practical model.

The limitations of the study include conducting the research in a single setting and the reduced number of older adult participants, which may impact the representativeness

of the sample. The strengths of the study include the follow-up over a period of one year, allowing for a longitudinal evaluation of the outcomes, in addition to the measurements being carried out by a single, trained evaluator from the workplace, which contributes to the standardization of procedures and the reduction of inter-evaluator bias.

The other indicators did not show statistically significant correlations, which may indicate an absence of association or a limitation of the sample in detecting effects. Given the significant correlations among the indicators, it is important to reiterate that correlation between indicators does not imply causality. The correlations found, however, provide important evidence for future analyses and for the development of joint and expanded intervention strategies, guiding the clinical, care, and management practices of LTCFs.

CONCLUSION

The results of this study point to recommending the expansion of indicators as a strategy to qualify the assessment of care provided in Long-Term Care Facilities for Older Adults in order to identify weaknesses, recognize good practices, and efficiently allocate resources. The correlation of quality indicators highlights the complexity of the care required by the multidisciplinary team, demanding monitoring systems sensitive to long-term outcomes. The findings reinforce that adopting an expanded set of parameters—clinical, functional, nutritional, and psychosocial—is essential to capture the nuances of institutionalized aging and consolidate safe and humanized care practices, centered on the older person.

Implications for practice

The study expands indicators for use in Long-Term Care Facilities in a systematized way, with conceptual and operational definitions that allow their replication in clinical practice, and it can also contribute to the training of LTCF professionals and to future research adopting and testing the indicators and the monitoring program. It also offers an instructional Practical Guide together with *checklists* of the indicators, suitable for use in practice. The use of the indicators guides the implementation of preventive measures and personalized interventions to improve the quality of care for institutionalized older adults. In summary, integrating regulatory, clinical, and management indicators within continuous quality improvement cycles elevates gerontological care, strengthens institutional management, and promotes care environments aligned with the needs of long-term care facility residents.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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