ORIGINAL ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

# *ASSESSMENT OF PRESSURE INJURY RISK IN INSTITUTIONALIZED ELDERLY PEOPLE*

# *EVALUACIÓN DEL RIESGO DE ÚLCERAS POR PRESIÓN EN PERSONAS MAYORES INSTITUCIONALIZADAS*

# AVALIAÇÃO DO RISCO DE LESÃO POR PRESSÃO EM IDOSOS INSTITUCIONALIZADOS

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**ABSTRACT**
**Objective:** to assess and describe the risk of developing pressure injuries (PI) in institutionalized elderly people. **Method:** a cross-sectional, descriptive, and quantitative study conducted with 52 residents of a Long-Term Care Facility for the Elderly. Data collection took place between August 2022 and March 2024, using a structured instrument to gather sociodemographic and clinical variables, as well as preventive measures related to pressure injuries and the Braden Scale. **Results:** male participants were predominant (92.3%, n=48), with an average age of 75.9 years. The prevalence of pressure injuries was 13.5% (n=7). Regarding the application of the Braden Scale, 44.2% (n=23) were classified as no risk, 21.2% (n=11) as low risk, 9.6% (n=5) as moderate risk, 21.2% (n=11) as high risk, and 3.8% (n=2) as very high risk for developing pressure injuries. **Conclusion:** the study identified elevated risks for the development of PI among the elderly due to factors such as mobility, activity, and friction and shear. Care plans should be developed for the elderly residents, focusing on preventive action by the nursing team.
**Keywords**: Geriatric Nursing; Health of Institutionalized Elderly People; Pressure Injury; Nursing Care; Frail Elderly.

**RESUMEN**
**Objetivo:** evaluar y describir el riesgo de desarrollo de úlceras por presión (UPP)en personas mayores institucionalizadas. **Método:** estudio transversal, descriptivo y cuantitativo, realizado con 52 residentes de una Institución de Larga Estancia para Personas Mayores. La recolección de datos se llevó a cabo entre agosto de 2022 y marzo de 2024, utilizando un instrumento estructurado para recolectar variables sociodemográficas, clínicas y medidas preventivas relacionadas con úleras por presíon, así como la Escala de Braden y Índice de Katz. **Resultados:** predominó la participación masculina (92,3%, n=48) y la media de edad de 75,9 años. La prevalencia de UPP fue del 13,5% (n=7). En cuanto a la aplicación de la Escala de Braden, el 44,2% (n=23) fue clasificado como sin riesgo, el 21,2% (n=11) como bajo riesgo, el 9,6% (n=5) presentó riesgo moderado, el 21,2% (n=11) como alto riesgo y el 3,8% (n=2) como muy alto riesgo de desarrollar úleras por presíon. **Conclusión:** el estudio identificó riesgos elevados para el desarrollo de UPP entre los adultos mayores, debido a factores como movilidad, actividad y fricción y cizallamiento. Deben elaborarse modelos de cuidado para los adultos mayores enfocándose en una actuación preventiva del equipo de enfermería.
**Palabras clave:** Enfermería Geriátrica; Salud del Adulto Mayor Institucionalizado; Úlcera por Presión; Atención de Enfermería; Mayor Frágil.

**RESUMO**
**Objetivo:** avaliar o risco de desenvolvimento de lesão por pressão (LPP) em pessoas idosas institucionalizadas. **Método:** estudo transversal, descritivo e quantitativo, realizado com 52 residentes de uma Instituição de Longa Permanência para Idosos. A realização da coleta ocorreu entre os meses de agosto de 2022 a março de 2024, sendo utilizado um instrumento estruturado para coleta de variáveis sociodemográficas, clínicas e com as medidas preventivas relacionadas à lesão por pressão e à Escala de Braden e ao Índice de Katz. **Resultados:** predominaram participantes do sexo masculino (92,3%, n=48) e a média de idade foi de 75,9 anos. A prevalência de lesão por pressão foi de 13,5% (n=7). Quanto à aplicação da Escala de Braden, 44,2% (n=23) foram classificados como sem risco, 21,2% (n=11) como risco baixo, 9,6% (n=5) apresentaram risco moderado, 21,2% (n=11) como risco alto e 3,8% (n=2) como risco muito alto para desenvolver lesão por pressão. **Conclusão:** O estudo identificou riscos elevados para o desenvolvimento de LPP entre os idosos, devido a fatores como mobilidade, atividade e fricção e cisalhamento. Devem ser elaborados modelos de cuidado para os idosos, focando em uma atuação preventiva da equipe de enfermagem.
**Palavras-chave:** Enfermagem geriátrica; Saúde do Idoso Institucionalizado; Lesão por Pressão; Cuidados de Enfermagem; Idoso Fragilizado.

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## INTRODUCTION

During the aging process, several anatomical, physiological, and functional changes occur, including tissue fragility, decreased mobility, and sensory perception[1]. These are some of the risk factors associated with the development of Pressure Injury (PI), especially in elderly individuals. These injuries are characterized by damage to the skin or adjacent tissue, commonly in areas of bone prominence, causing cell necrosis due to hypoxia. It is considered an avoidable adverse event of multifactorial origin, with a significant impact on morbidity and mortality in immobilized patients, particularly in bedridden elderly individuals, whether at home, in hospitals, or in Long-Term Care Institutions (LTCIs)[2].

Pressure Injuries are classified by the National Pressure Ulcer Advisory Panel (NPUAP) based on their appearance, into four stages: Stage 1, characterized by erythema on intact epidermis in areas of bone prominence; Stage 2, defined by partial loss of epidermis and dermis thickness; in Stage 3, there is loss of subcutaneous tissue; and in Stage 4, there are deep injuries due to the loss of muscle tissue, ligaments, tendons, cartilage, and bone exposure. In addition to the stages, the NPUAP also classifies other types of PIs into: unclassifiable pressure injury; pressure injury in mucosal membranes; deep tissue pressure injury; and pressure injury due to medical devices[3,4].

As the elderly population has been growing significantly over the past decades, it is evident that, although family care is still the most common and beneficial, there is a growing demand for permanent or long-term care for the elderly[5]. These cares are related to the complexity of the aging process, which can be healthy or not, depending on the individual's social and health conditions, family, and community, among other factors that can lead to the loss of autonomy and independence, which, when combined with the lack of family support, predisposes to institutionalization[6,7].

In the context of LTCIs, elderly individuals are at higher risk of developing PIs due to being considered more fragile and having multiple comorbidities, as well as several geriatric syndromes, leading to immobility and requiring greater costs for treatment, acquisition of materials and supplies, which are often not available in LTCIs[8].

Thus, preventive measures are emphasized, considering that the elderly population presents intrinsic risk factors – such as age, skin fragility, mobility restrictions – and extrinsic factors – such as pressure, friction, shear, and moisture – that contribute to the appearance of these injuries. Hence, nursing care for the elderly is highlighted, particularly for those institutionalized. Through the application of the Nursing Process, it is possible to develop a personalized care plan that meets the specific needs of each individual, aiming to prevent these injuries[9].

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Therefore, it is crucial that every institutionalized elderly person be assessed for the risk of developing PIs, which constitutes the first step in prevention. For this assessment, the Ministry of Health recommends the use of the Braden Scale, which aims to classify individuals according to their risk of developing PIs based on variables such as sensory perception, activity, mobility, exposure to moisture, nutritional intake, and the influence of friction and shear[10].

Among the interventions that contribute to the prevention of PIs are: skin assessment at admission; daily reassessment of potential injury development; daily skin inspection; keeping clothing and bedding dry and clean; optimizing nutrition and hydration; and minimizing pressure on bony prominences[10].

Considering the relevance of the subject for the quality of life and care provided to institutionalized elderly individuals, this study aimed to assess the risk of developing PIs using the Braden Scale in institutionalized elderly people.

## METHOD

This is a descriptive, cross-sectional study with a quantitative approach, guided by the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) tool, conducted in a Long-Term Care Institution for the Elderly in the far north of Brazil, with a capacity to accommodate approximately 40 elderly individuals in social vulnerability.

The study included elderly individuals residing in the institution during the data collection period, which occurred from August 2022 to March 2024, including both sexes, aged 60 or older. The final non-probabilistic convenience sample consisted of 52 institutionalized elderly individuals who already resided and were admitted during the research period. No exclusion criteria were applied.

Data collection was conducted through weekly visits to the institution. The data were collected by students from the 6th and 8th semesters of the Nursing course, under the supervision of a nurse professor, during the development of an extension project in collaboration with the research project conducted at the institution.

A tool developed for this study was used, containing sociodemographic and clinical variables, which were collected from the patient records. A physical skin examination of the elderly was also performed, along with the application of the Braden Scale, the Katz Index, and the Mini-Mental State Examination (MMSE), as well as the identification of preventive measures for PIs already used in the institution's routine during the data collection period through observation.
The Braden Scale, used to assess the risk of developing PIs, consists of six categories: sensory perception; moisture; activity; mobility; nutrition, which score from 1 to 4; and friction and shear, which score from 1 to 3. The final score indicates the risk classification for developing PIs: very high risk (≤ 9); high risk (10-12 points); moderate risk (13-14 points); low risk (15-18 points); and no risk (19-23 points)[11].

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The Katz Index was used to determine the dependency of elderly individuals for performing activities of daily living (ADLs). Based on this index, elderly individuals were classified as independent (independence in all six evaluated items), partially dependent (dependence in one to five activities), and dependent (dependence in all six evaluated items) in six activities: bathing; dressing; toileting; continence; transferring; and feeding[12].

The cognitive status of the elderly was evaluated using the Mini-Mental State Examination (MMSE). The test has a total score of 30 points, and for establishing the result, the individual's education level should be considered according to the cutoff scores suggested (illiterate: 19 points; 1 to 3 years of schooling: 23 points; 4 to 7 years of schooling: 24 points; more than 7 years of schooling: 28 points)[12].

The data collected were stored in Microsoft Excel® spreadsheets, and descriptive statistical analysis was conducted through the calculation of relative and absolute frequencies, measures of central tendency, and dispersion (mean and standard deviation).

This study is part of a larger project titled "Nursing Care in Gerontology: Integrating Teaching and Service," which was submitted and approved by the Research Ethics Committee on Human Beings, under opinion No. 5.541.017.

## RESULTS

A total of 52 elderly individuals residing in the institution during the data collection period participated in the study. Of these, 92.3% (n=48) were men, with a mean age of 75.9 (±9.2) years, ranging from 60 to 95 years. The average span of institutionalization was 3.1 (±3.9) years, ranging from 9 days to 18 years.

All participants in the study (100.0%; n=52) had at least one diagnosis of a chronic disease, with an average of 2.3 (±1.5) chronic diseases per individual. Among the most frequent conditions were hypertension (HT) (76.9%; n=40), sequelae from stroke (36.6%; n=18), and type II diabetes mellitus (DM) (21.2%; n=11), with some participants having multiple comorbidities.

During the study, seven elderly individuals with PIs were identified, resulting in a prevalence of 13.5%. Of these seven, 57.1% (n=4) had one injury, 28.6% (n=2) had three injuries, and 14.3% (n=1) had two injuries.

Regarding the characteristics of the 12 identified injuries, 50.0% (n=6) were located in the sacral region, 25.0% (n=3) in the trochanteric region, 16.7% (n=2) in the calcaneal region, and 8.3% (n=1) in the iliac region. Regarding classification, 50.0% (n=6) of the injuries were classified as Stage II, 33.4% (n=4) as Stage III, 8.3% (n=1) as unclassifiable, and 8.3% (n=1) as Stage I PI.

As for the Braden Scale application, 44.2% (n=23) scored between 19 and 23 points, being classified as no risk for PI development, and 21.2% (n=11) scored between 15-18, being considered at low risk. 9.6% (n=5) scored between 13-14, indicating moderate risk. Meanwhile, 21.2% (n=11) of the elderly scored

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between 10-12 points, indicating high risk, and 3.8% (n=2) were classified as very high risk for PI development, with scores between 6 and 9. Table 1 presents the results of the scale with the corresponding measures of central tendency and dispersion (Table 1).

**Table 1 -** Distribution of the institutionalized elderly population, according to the risk of developing Pressure Injury (n=52).

| Braden | n | % | Average (±DP) | Median | Min-Max |
|---|---|---|---|---|---|
| **No risk** | 23 | 44.2 | 21.5 (±1.30) | 22 | 19-23 |
| **Low risk** | 11 | 21.2 | 16.8 (±0.98) | 17 | 15-18 |
| **Moderate risk** | 5 | 9.6 | 13.6 (±0.54) | 14 | 13-14 |
| **High risk** | 11 | 21.2 | 11.2 (±0.60) | 11 | 10-12 |
| **Very high risk** | 2 | 3.8 | 9.0 (±0.00) | 9 | 9-9 |

In the analysis of the distribution of elderly individuals according to the variables of the Braden Scale, it can be observed that the variables "activity," "mobility," and "friction and shear" had the highest percentages in relation to the risks for the development of Pressure Injury (PI), as 46.2% (n=24) of the elderly individuals were considered "confined to a chair" and 36.5% (n=19) were completely immobile. Regarding friction and shear, 36.5% (n=19) had a real problem, and 23.1% (n=12) had a potential problem in this aspect (Table 2).

**Table 2** - Distribution of the elderly population residing in the LTCI, according to the subitems of the Braden Scale variables (n=52)

| Variables of the Braden Scale | n (=52) | % |
|---|---|---|
| **Sensory Perception** | | |
| 1. Totally Limited | 2 | 3.8 |
| 2. Very Limited | 7 | 13.5 |
| 3. Slightly Limited | 10 | 19.2 |
| 4. No Limitation | 33 | 63.5 |
| **Moisture** | | |
| 1. Completely Wet | 0 | 0.0 |
| 2. Very Wet | 1 | 1.9 |
| 3. Occasionally Wet | 24 | 46.2 |
| 4. Rarely Wet | 27 | 51.9 |
| **Activity** | | |
| 1. Bedridden | 4 | 7.7 |
| 2. Confined to a Chair | 24 | 46.2 |
| 3. Occasionally Walks | 5 | 9.6 |
| 4. Frequently Walks | 19 | 36.5 |
| **Mobility** | | |
| 1. Totally Immobile | 19 | 36.5 |
| 2. Quite Limited | 5 | 9.6 |
| 3. Slightly Limited | 8 | 15.4 |
| 4. No Limitation | 20 | 38.5 |

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| | | |
|---|---|---|
| **Nutrition** | | |
| 1. Very Poor | 0 | 0.0 |
| 2. Probably Inadequate | 12 | 23.1 |
| 3 Adequate | 37 | 71.1 |
| 4. Excellent | 3 | 5.8 |
| **Friction and Shear** | | |
| 1. Problem | 19 | 36.5 |
| 2. Potential Problem | 12 | 23.1 |
| 3. No Problem | 21 | 40.4 |

Table 3 presents the distribution of elderly individuals according to cognitive condition, mobility, and degree of dependence. In these aspects, a high percentage of elderly individuals with cognitive impairment was observed (86.5%; n=45), as evidenced by those with MMSE results suggestive of alteration (48.0%; n=25), combined with those for whom the test could not be administered (38.5%; n=20).

Regarding mobility, 44.2% (n=23) ambulated independently or with the aid of devices such as a cane or walker, 36.5% (n=19) were bedridden/confined to a bed/chair, and 19.3% (n=10) were wheelchair-bound.

The degree of dependence, as determined by the Katz Index, showed a high percentage (51.9%; n=27) of elderly individuals dependent on one or more ADLs (Katz B, C, D, E, and F), and the number of totally dependent individuals for these activities (Katz G) was 25.0% (n=13). This represents a total of 76.9% (n=40) of elderly individuals requiring assistance with activities such as bathing, dressing, going to the bathroom, transferring, maintaining continence, and eating.

**Table 3 -** Distribution of elderly individuals based on the application of the Mini-Mental State Examination (MMSE), for mobility and degree of dependence using the Katz Index (n=52).

| Variable | n (=52) | % | Average (±SD) |
|---|---|---|---|
| **MMSE** | | | |
| Suggestive of cognitive impairment | 25 | 48.0 | 9.64 (±5.25) |
| Not suggestive of cognitive impairment | 7 | 13.5 | 21.14 (±2.03) |
| Not applicable* | 20 | 38.5 | * |
| **Activity** | | | |
| Ambulates with/without assistance | 23 | 44.2 | - |
| Bedridden/confined to bed/chair | 19 | 36.5 | - |
| Wheelchair-bound | 10 | 19.3 | - |
| **Degree of dependence** | | | |
| Totally independent (Katz A) | 12 | 23.1 | - |
| Dependent for one to five activities (Katz B, C, D, E, F) | 27 | 51.9 | - |
| Dependent for all activities (Katz G) | 13 | 25.0 | - |

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## DISCUSSION

The assessment of the risk for the development of Pressure Injury (PI) as part of the nursing care plan for institutionalized elderly individuals is essential for health promotion and the prevention of complications associated with immobility. It is well known that elderly individuals are particularly vulnerable to these injuries due to factors such as skin fragility, decreased mobility, and common comorbidities in this age group. Furthermore, institutionalized elderly individuals are considered more fragile and require evaluations and interventions that promote quality of life[13].

Pressure Injuries represent an important public health problem, especially among the elderly population residing in LTCIs, which is rapidly increasing. Regarding the prevalence of these injuries, data vary depending on the context in which the elderly person is placed. In long-term care institutions, such as the nursing home where this study was conducted, the prevalence rates of PI range from 11.1% to 25.2%, and can reach 37%[14,15]. In the present study, the prevalence of PI among institutionalized elderly individuals was 13.5%.

Among the injuries identified in elderly individuals during the course of this study, lesions in the sacral and trochanteric regions predominated, mostly classified as Stage II and III. These areas are frequently affected due to prolonged pressure and decreased mobility in elderly patients, which increases the risk for the development of PI. Early identification and proper intervention in these regions are essential for the prevention and effective treatment of these injuries, as prevention and treatment focused approaches can significantly reduce associated complications (16,17).

From the application of the Braden Scale, it was observed that 55.8% (n=29) of the elderly individuals were at some risk for the development of PI, ranging from "low risk" (21.2%) to "high risk" (21.2%) and "very high risk" (3.8%). A study conducted in Italy using the same assessment tool with elderly individuals who received home care and lived alone obtained similar results to those of the present study for low-risk (25.8%) and high-risk (15.5%) classifications, in addition to the result for very high risk (7.1%) being under 10%[18].

By examining each variable of the Braden Scale, it is possible to take a critical look at the main factors contributing to the development of PI in the elderly participants of the study. This evaluation can guide personalized prevention and care strategies for each individual, focusing on their specificities.

Immobility is one of the most important risk factors when assessing elderly individuals for the risk of developing pressure injury. Sequelae of CVA (Cerebrovascular Accident), spinal cord injuries, and lower limb fractures reduce mobility by interfering with elderly people's ability to perform basic activities[19]. Therefore, the "mobility" variable reveals that 36.5% of the elderly individuals were completely immobile and 9.6% were highly limited, showing a relationship between physical

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limitations, risk of developing PI, and the degree of immobility of these elderly individuals.

The low scores in the mobility and friction and shear variables highlight the high risk for the development of PI in bedridden and/or confined elderly individuals, as decreased mobility leads to increased friction and shear forces during patient handling[20,17].

Skin fragility is intensified due to age-related changes. Thus, abrasions can form during bed-to-chair-to-bed transfers and position changes, as sudden movements of the skin over bony prominences and surfaces, such as sheets or chair fabric, can lead to the appearance of blisters, epidermal ruptures, and even deeper dermal injuries[17].

Elderly individuals with greater degrees of dependence, as observed in the participants of this study, are at higher risk for developing PI due to their fragile condition, characterized by the loss of autonomy, independence, and mobility[21]. This impedes or prevents the performance of simple actions, such as body movement, leading to prolonged periods in the same position. Other factors, such as skin fragility, moisture, cognitive decline, and other comorbidities associated with the limitations of these elderly individuals, highlight the need for comprehensive and direct care to perform activities such as bathing, changing clothes, repositioning, among others[22].

Cognitive deficits have multifactorial causes, including smoking, alcoholism, chronic diseases (hypertension, type II diabetes, and CVA sequelae), depression, anxiety, and decreased functional capacity, all of which significantly impair quality of life[23,24]. Elderly individuals who are dependent to perform daily activities, with some mobility limitations and cognitive deficits, tend to be more prone to developing PI due to decreased sensory perception[25], as evidenced by the elderly individuals in this study who showed moderate (9.6%), high (21.2%), and very high (3.8%) risk for pressure injury.

Regarding the PI prevention measures used in the LTCI, it was observed the practice of repositioning after every 2 hours, using cushions to reduce tissue pressure on bony prominences, and using pneumatic mattresses. However, it was noted that better adjustments are needed for reducing friction and shear in immobile elderly individuals who use diapers, such as prioritizing short periods (1 hour) for the positioning of bedridden patients in wheelchairs, with necessary support to avoid sliding, rather than after periods longer than 2 hours[10,17].

Furthermore, there is a need to raise awareness among the institution's professionals regarding the use of risk assessment tools for the development of PI in daily routines, as well as updating appropriate treatment coverings for each stage of injury. It is also important to involve the entire multidisciplinary healthcare team and caregivers, which is crucial for comprehensive care, with a focus on PI prevention[16]. Conducting continuous training and continuing education, along with implementing evidence-based prevention measures and evaluating their effectiveness for

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elderly individuals in LTCIs, will aim to qualify nursing care, especially by the nurse, who will establish and adjust personalized care plans for each resident through identification, implementation, monitoring, and daily reassessment of the patient[26].

In this context, there is an increasing demand for LTCIs, which, regardless of whether they are public or private, government- or non-government-managed, must provide holistic, high-quality care for elderly residents, promoting their autonomy, independence, and participation in health promotion, respecting their particularities, and meeting their needs as best as possible, although, in most cases, they are not prepared to meet the demand[7].

Due to its impact on health, it is essential to develop planning capable of guiding good care practices in LTCIs, aiming to implement effective practices for PI prevention. With this objective, nurses working in these settings need to take on the responsibility of care prescribers, supervisors, and guides for caregivers regarding daily care to maintain skin integrity, following planned activities[27].

## CONCLUSIONS

The conclusions point to descriptions of elevated risks for the development of PI among elderly individuals due to factors such as mobility, activity, and friction and shear, which align with studies in the field, and highlighted the need to qualify nursing and caregiver teams regarding PI prevention, skin care, and continuous evaluation of elderly individuals.

Furthermore, it is emphasized that a large portion of elderly individuals with cognitive deficits and decreased mobility, which directly influence sensory perception and independence for performing basic daily activities, have a higher degree of dependence and are more prone to developing PI.

The use of the Braden Scale as a tool for assessing the risk of PI development in elderly individuals was shown to be a favorable and easy-to-handle instrument for the initial and subsequent evaluation of institutionalized elderly people, as it tracks the evolution of risk classification through the implementation of more appropriate prevention measures.

One limitation of this study is that the sample is not representative of the general population, which compromises the ability to generalize the results found. The sample was restricted to a specific number of participants, which may not reflect the diversity and characteristics of the larger population. This means that the study's conclusions are valid only for the analyzed group and cannot be applied broadly to other contexts or populations, limiting the generalization of the findings.

However, the data from this study allow for the development of care models for both groups of elderly individuals — those with and without risks — focusing on preventive nursing interventions in collaboration with the multidisciplinary team, improving the quality of healthcare provided, and, consequently, promoting the quality of life of elderly residents in LTCIs. Thus, the study calls for the scientific

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investigation of the associations between nursing interventions and other areas of healthcare assistance related to this topic.

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In obtaining, analyzing and/or interpreting the data: Eulalio RBNM, Ferreira LG, Cruz AL, Silveira GC, Caldart RV.
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**Conflict of Interests**

“Nothing to declare”.

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