

# CUIDADO É FUNDAMENTAL

Escola de Enfermagem Alfredo Pinto – UNIRIO

SYSTEMATIC REVIEW OF LITERATURE

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## RISK FACTORS FOR THE DEVELOPMENT OF PRESSURE INJURY IN THE ELDERLY: INTEGRATIVE REVIEW

*Fatores de risco o para desenvolvimento de lesão por pressão em idosos: revisão integrativa**Factores de riesgo para el desarrollo de lesiones por presión en los ancianos: revisión integrativa***Ana Patricia do Egito Cavalcanti de Farias<sup>1</sup>** **Ronaldo Bezerra de Queiroz<sup>1</sup>** 

### ABSTRACT

**Objective:** to analyze the scientific production on the prevention of pressure injuries in the elderly, identifying the predisposing factors for its emergence. **Method:** integrative review carried out in September 2019, in the LILACS, MEDLINE, CINAHL, Scopus and Web of Science databases. **Results:** fifteen articles were selected from a universe of 618 publications with predominance of cross-sectional and international studies. The analysis identified advanced age, presence of comorbidities, malnutrition, immobility, prolonged hospital stay are risk factors. **Conclusion:** it becomes increasingly clear the importance of preventing pressure injuries, observing the clinical conditions, identifying risk factors, performing early intervention in order to minimize its incidence, thereby improving the quality of life of the elderly.

**DESCRIPTORS:** Pressure ulcer; Elderly; Prevention; Risk factors; Quality of life.

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## RESUMO

**Objetivo:** analisar a produção científica acerca da prevenção de lesões por pressão em idosos, identificando os fatores predisponentes para o seu surgimento. **Método:** revisão integrativa realizada no mês de setembro de 2019, nas bases de dados LILACS, MEDLINE, CINAHL, Scopus e *Web of Science*. **Resultados:** quinze artigos foram selecionados, de um universo de 618 publicações, com predomínio de estudos transversais e internacionais. A análise identificou que a idade avançada, presença de comorbidades, má nutrição, imobilidade, tempo prolongado de internação configuram-se como fatores de risco. **Conclusão:** torna-se cada vez mais clara a importância de prevenir a lesão por pressão, observando as condições clínicas, identificando os fatores de risco, realizando intervenção precoce a fim de que seja minimizada sua incidência melhorando com isso a qualidade de vida do idoso.

**DESCRITORES:** Lesão por pressão; Idoso; Prevenção; Fatores de risco; Qualidade de vida.

## RESUMEN

**Objetivo:** analizar la producción científica sobre la prevención de las lesiones por presión en el adulto mayor, identificando los factores predisponentes para su aparición. **Método:** revisión integradora realizó en septiembre de 2019, en las bases de datos LILACS, MEDLINE, CINAHL, Scopus y *Web of Science*. **Resultados:** quince artículos fueron seleccionados de un universo de 618 publicaciones, con predominio de estudios transversales y internacionales. El análisis identificó que la edad avanzada, la presencia de comorbilidades, la desnutrición, la inmovilidad, la estancia hospitalaria prolongada son factores de riesgo. **Conclusión:** se hace cada vez más evidente la importancia de prevenir las lesiones por presión, observar las condiciones clínicas, identificar los factores de riesgo, realizar una intervención temprana para minimizar su incidencia, mejorando así la calidad de vida de los ancianos.

**DESCRIPTORES:** Úlcera por presión; Anciano; Prevención; Factores de riesgo; Calidad de vida.

## INTRODUCTION

Pressure ulcers (PUs) are a universal public health problem, whose attention has been highlighted in the context of the global movement for patient safety, since they can cause several types of harm to individuals.<sup>1</sup>

It has implications in the lives of people who develop it, as it is a source of pain, discomfort, emotional suffering, and increases the risk of developing other complications, influencing morbidity and mortality.<sup>2</sup> For health services, it generates high costs, as it requires specific treatments, leads to prolonged hospitalization, increases the workload of the health team, and is considered an indicator of the quality of care provided and generally guides the development of public policies, decision-making, goal setting, and comparison between institutions.<sup>3-5</sup>

With regard to this type of injury, it is relevant to mention that in April 2016, the National Pressure Ulcer Advisory Panel (NPUAP) published new guidelines for their classification and announced a change in the terminology “Pressure Ulcer” to “Pressure Injury”, defining it as an injury located on the skin and/or underlying soft tissues, usually over a bony prominence or related to the use of a medical device or other artifact.<sup>6</sup>

It occurs as a result of intense and/or prolonged pressure in combination with shear and intrinsic patient factors. Among the factors associated with the risk of its development are advanced age, systemic arterial hypertension, diabetes, unconsciousness, immobilization, loss of sensibility, loss of motor function, loss of urinary or fecal continence, presence of muscle spasms, nutritional deficiencies, anemia, very high or very low body mass index, circulatory diseases, peripheral arterial disease, immunodeficiency or use of corticosteroids, and smoking.<sup>6-7</sup>

With the population aging more and more and with the natural aging process, the organic transformations that occur increase the risk of the elderly to develop pressure ulcers and consequently require more care, since advanced age produces intense changes in the human body making it more vulnerable due to changes in skin structure, impaired mobility, altered cognitive pattern and the presence of degenerative diseases.<sup>7-8</sup>

Therefore, it is necessary and relevant to recognize the specific factors that put people at risk in order to provide subsidies for the analysis and determination of the most appropriate interventions, thus contributing to the planning and implementation of actions aimed at preventing this disease. Therefore, this study aimed to analyze the scientific production on the prevention of PU in the elderly, identifying the predisposing factors for its emergence.

## METHODS

This is an integrative literature review, considered a research method that allows the search, critical evaluation and synthesis of available evidence on the investigated theme. It includes the analysis of relevant research in the scientific community on the investigated theme, in addition to identifying gaps in knowledge that need to be filled by further research.<sup>9</sup>

The integrative review was built in the following stages: 1) formulation of the guiding question; 2) search of primary databases; 3) selection and categorization of studies; 4) evaluation of the selected studies; 5) discussion and interpretation of results; and 6) synthesis of knowledge with recommendations for practice.

To guide the study, the following guiding question was formulated: What is the scientific evidence on the prevention and predisposing factors for the development of PU in the elderly?

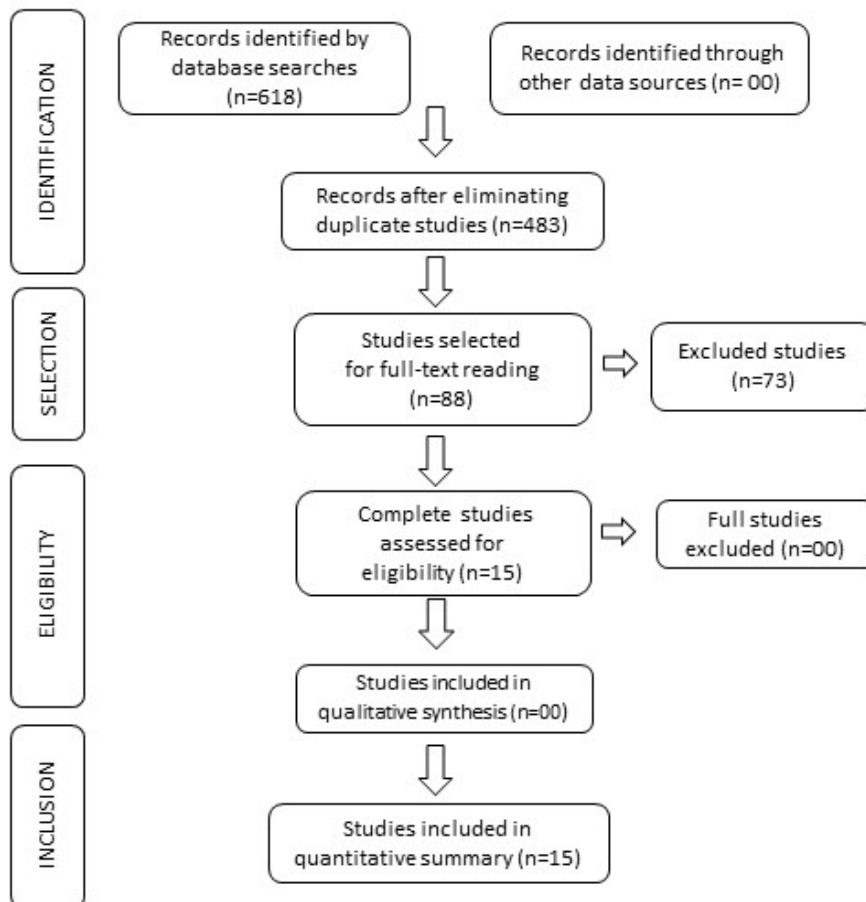
The search for articles was conducted in September 2019 in the databases of Latin American and Caribbean Literature in Health Science (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Elsevier B.V. (Scopus), and Thomson Reuters Scientific (Web of Science). Cross-references were made with descriptors indexed in MeSH Terms: “pressure ulcer” OR “decubitus ulcer” OR bed sore AND aged. These descriptors were combined with the Boolean operators AND and OR in order to refine the studies.

The inclusion criteria defined for the selection of articles were: original articles; primary research developed with human beings and published between the years 2014 and 2019; with an approach to prevention and risk factors related to PU in the elderly, measured by validated instruments in national and international journals; available in English, Spanish and Portuguese languages in full and indexed in these databases. The period defined was due to the fact that studies in the health area are constantly evolving, and its updating is essential.

Review articles, opinion articles, dissertations, theses, articles that did not answer the guiding question, and duplicate articles were excluded. A total of 618 scientific articles were selected, and of this quantity, the articles were evaluated for quality and adequacy to the eligibility criteria among the databases; after refinement, the final sample consisted of 15 articles. The selection of studies was organized according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) recommendations as shown in Figure 1.<sup>10</sup>

For data collection, we used an instrument composed of database, title, authors, year of publication, country, journal, objective, methodological approach, sample, and main results.

As for the selection of articles, the title and abstract of each publication were carefully read in order to check for consistency with the guiding question. When there was doubt regarding the inclusion or exclusion of the study, it was read in its entirety to reduce the risk of losing relevant publications. Thus, those that did not address the theme were discarded in the second analysis.



**Figure 1** – Flowchart of study selection adapted from the Preferred Reporting Items for Systematic Reviews and Meta- Analyses (PRISMA 2009). João Pessoa, PB, Brazil, 2019

Regarding the classification of the levels of evidence, it was considered: I – Evidence derived from systematic review or meta-analysis of all relevant randomized controlled trials or from clinical guidelines based on systematic reviews of randomized controlled trials; II – Evidence derived from at least one well-designed randomized controlled trial; III – Evidence from well-designed clinical trials without randomization; IV – Evidence from well-designed cohort studies and case-control studies; V – Evidence from systematic review of descriptive and qualitative studies; VI – Evidence from a single descriptive or qualitative study; VII – Evidence from opinion of authorities and/or expert committee reports.<sup>11</sup>

## RESULTS

A total of 15 articles were selected from a universe of 618 publications, where nine were indexed in the MEDLINE database; one in CINAHL; two in Scopus; two in the Web of Science; and one in LILACS. Chart 1 reveals the synthesis of the included articles, in which we identified variables related to the selected publications: identification of the publication (authors, year, country of study), objective, type of study, level of evidence, sample, and main results. The data were examined by means of descriptive analysis in order to answer the research's guiding question.

**Chart 1** – Characterization of the selected studies according to identification, objective, type of study, level of evidence, sampling and main results. João Pessoa, PB, Brazil, 2019

Authors, Year/ Country of Study	Goal	Study Type	Level of Evidence	Sample/Main Results
Vieira et al. <sup>12</sup> (2018); Brasil	To assess the risk of institutionalized elderly people with impaired performance of activities of daily living to develop PUs.	Transversal	VI	Sample 42 elderly people. Average age 79.07. Majority female. Prevalence of PU risk was 64.3%. Braden Scale.
Karahan et al. <sup>13</sup> (2018); Turquia	To identify factors that may affect wound healing in individuals with pressure ulcers in a private university hospital.	Retrospective cohort	IV	Sample 78 records. Mean age 70.8 ±. Female gender (52.6%). Chronic diseases and medications can affect healing. Braden Scale.
MBARKA et al. <sup>14</sup> (2017); Tunísia	Measure the prevalence of pressure ulcers in the hospital. Measure risk and analyze risk factors for pressure ulcers, and evaluate means of prevention in patients at risk.	Transversal	VI	Sample 473 patients. Acquired during hospitalization (93%). Mean age 52.26; Men (53%). Half use modern dressings. Little record in medical records. Malnutrition and immobilization represent a risk. Braden Scale.
Silva et al. <sup>15</sup> (2017); Brasil	To analyze the socio demographic and clinical profile associated with skin and wound care in hospitalized elderly.	Prospective cohort	IV	Sample 75 patients. Mean age 73.6. Prevalence of women. Prolonged hospitalization (65.3%) mainly for cardiovascular disease, cancer and infection.
Amir et al. <sup>16</sup> (2017); Indonésia	Assess the outcome indicator(nosocomial prevalence of PU), process indicators (PU preventive measures) and structural quality indicators (hospital facilities/wards and resources for PU care, as well as the characteristics of patients related to PU in Indonesia.	Transversal	VI	Sample 1132 patients. Average age 48.7 years. Preventive measures patient education, repositioning and skin hydration.
Reffatti et al. <sup>17</sup> (2017); Brasil	To evaluate the risk of developing pressure ulcers and associated factors using the Braden scale, validated in Brazil, in elderly individuals aged 60 years or older, living in a long-stay care facility in a medium-sized city in the south of Brazil	Transversal	VI	Sample 21 elderly where 66.6% were between 60 to 79 years old. Braden Scale.
Bergstrom et al. <sup>18</sup> (2014); EUA	Determine the optimal repositioning frequency in long-term care facilities for residents at risk for pressure ulcers who are cared for on high-density foam mattresses.	Randomized clinical trial	II	Sample 942 participants. Mean age 85.1%. Female gender (77.6%). Most common comorbidities: cardiovascular disease and dementia. High-density foam replacement mattresses. Braden scale.
Lai; Yip; Sham <sup>19</sup> (2019); China	To identify the relationships between patients' functional status, systemic factors, and wound condition and the likelihood of pressure injury healing in palliative care in a hospital setting.	Retrospective cohort	IV	Accomplished 127 medical records. Ages 40 to 97 years. Advanced stage of the wound.
Pachá et al. <sup>20</sup> (2018); Brasil	To evaluate the relationship between the presence/absence of PUs and sociodemographic and hospitalization factors.	Case-control	IV	Study conducted on 189 patients who were considered cases and 570 patients who were considered controls. Male sex (66.1%). Age between 61 and 80 years. Risk factors: advanced age, infectious and parasitic diseases, cancer and prolonged hospitalization.

Chart 1 – Cont.

Authors, Year/ Country of Study	Goal	Study Type	Level of Evidence	Sample/Main Results
Dincer et al. <sup>21</sup> (2018); Turquia	To determine the effective factors in wound treatment and wound healing, along with the demographics of pressure ulcer (PU) patients in the palliative care (PC) center and the costs of PU treatment in the PC.	Retrospective cohort	IV	Study on 154 medical records. Male gender (55, 2%). Diabetes mellitus (24.7%); Hypertension (49, 4%).
Gray et al. <sup>22</sup> (2018); Inglaterra	Quantify the number, type, and treatment of complex wounds being treated over a two-week period and explore variations in care by comparing current wound assessment, prevention, and treatment practices	Transversal	VI	Sample 3179 patients, where covered eight community services in five regions of the National Health Service (NHS) in the North of England. People with complex wounds tended to be elderly (median age: 74) with at least one comorbidity, cardiovascular disease (57%).
Seyhan <sup>23</sup> (2018); Turquia	Examine the factors that affect the development of decubitus ulcer in home care patients and provide extensive data to the literature.	Transversal	VI	Sample 336 patients. Mean age 77.8 . Female gender (30.95%). Presence of urinary incontinence, accompanying diseases, equipment used by patients, malnutrition, decreased mobility, psychological problems.
Matozinhos et al. <sup>24</sup> (2017); Brasil	To estimate the incidence rate of PU in a cohort of patients hospitalized in the medical clinic and to verify the factors associated with this occurrence.	Prospective cohort	IV	Sample 442 adults. Length of stay was 22 days. Over 60 years old (37.78%). Female gender (54.98%). Braden Scale.
Bordghardt et al. <sup>25</sup> (2016); Brasil	To identify the incidence of PU and describe the factors associated with its development in adults admitted to the intensive care units of a university hospital in Vitória, Espírito Santo.	Prospective cohort	IV	Sample 77 patients. Male sex (59%). Age > 60 years (53%). Predominance of length of stay greater than 10 days (71%); Congestive heart failure (53%); High risk in the Braden scale (59%).
Bredesen et al. <sup>26</sup> (2015); Noruega	To investigate the association of ward level differences in the odds of hospital acquired pressure ulcers (HAPUs) with selected ward organizational variables and patient risk factors.	Transversal	VI	Sample 1056 patients in 84 somatic wards. Age above 70 years. Cost of care. Braden scale.

Regarding the origin, nine (60%) international publications were identified, three from Turkey, one from Tunisia, one from the USA, one from China, one from England, one from Norway and one from Indonesia and six (40%) national, carried out in different regions of the country.

Regarding the methodological design, seven cross-sectional studies, three retrospective cohort, three prospective cohort, one randomized clinical trial, and one case control were identified. Among the studies mentioned above, seven (46.66%) presented level IV evidence, seven (46.66%) level VI, and one (6.66%) level II.

As for the context, the hospital environment stood out, since it concentrated eleven (73.33%) articles, two (13.33%) in long-stay institutions, one (6.66%) at home, and one (6.66%) in community services. Thus, the occurrence of PU is a reality present in various places of health care.

## DISCUSSION

Increased longevity, individual characteristics, and a higher degree of dependence are risk factors for the formation of PU.<sup>13</sup> The literature assigns the elderly the group with the highest vulnerability because of the changes that appear in the skin regarding the reduction of subcutaneous and muscle cellular tissues,

observed by the decrease of elasticity and texture, making this skin more fragile when compared to the younger population.<sup>15,24</sup>

Concomitant to the aging process, the prevalence of PU can be further aggravated if associated with comorbidities. Chronic diseases are the most disabling, constituting 60% of deaths worldwide.<sup>21</sup> They affect sensory perception, mobility of the elderly, and can precipitate changes in blood circulation, including decreased oxygenation level, an essential factor for the healing process.<sup>27-28</sup>

From the analysis of the articles, cardiovascular disease was the most observed, followed by diabetes mellitus, neoplasms and infectious diseases.<sup>13,20-23</sup> A similar result was found in some research, which represented, respectively, 89.3%, 77.6% and 24% of the main comorbidities found.<sup>15,18,25</sup>

Regarding gender distribution, a slight predominance of females was observed, a fact probably associated with the feminization of old age, as pointed out by national data in which women represent 55.5% of the elderly population.<sup>29</sup> Other studies corroborated this parameter, both in national and international studies.<sup>12-13,15,18,24</sup> However, this variable does not seem to influence or present statistical significance to identify whether it is a contributing factor to the genesis and development of PU, as evidenced in some studies.<sup>30-31</sup> Therefore, it is not known for sure whether gender influences incidence, thus requiring further studies to prove this prerogative.



Another important point observed in the articles was the relationship between malnutrition and PU incidence, in which insufficient nutrition has an adverse effect on wound healing.<sup>13-14</sup> Nutrition is essential for the provision of nutritional support and metabolic needs of the skin, where nutrient deficiencies resulting from poor oral intake may cause malnutrition, reduce body immunity and tissue oxygenation, impair skin elasticity, and decrease tissue tolerance to pressure, negatively impacting wound healing. It is suggested that nutritional status and functional capacity have a clear relationship with the formation and severity of PU.<sup>32</sup>

With regard to prevention, the articles provided guidance on skin care to prevent injuries, such as periodic assessment; maintenance of hygiene, leaving the skin moist and hydrated; and periodic change of decubitus, because immobility, characterized by the limitation of the individual's ability to reposition himself, makes it impossible to relieve the pressure in areas of bone prominence due to the relationship between the intensity and duration of pressure, contributing to tissue destruction and becoming a predictive factor for the development of PU.<sup>12-13</sup> The adoption of appropriate mobilization techniques aims to reduce the pressure applied by body weight and improve local blood supply, reducing prolonged compression of the skin and consequently ischemia.<sup>16,18</sup>

Some other PU preventive measures were mentioned, such as patient education and repositioning, where dependence and immobility are associated with the rate of PU.<sup>16</sup> Mobility problems affect injury healing, where only 22.5% of patients with mobility problems had the injury healed, and those without this problem totaled 47.4%.<sup>13</sup> Therefore, it can be said that mobility contributes significantly to prevention.

For prevention and treatment, the following measures were also addressed: placement of adequate mattresses; application of protective covers in areas of greater pressure and bony prominences; use of different types of dressings, which promote skin protection; and reduction of friction and shearing forces, since the location of lesions is concentrated in the regions of bony prominences such as the sacrum and calcaneus; however, they can occur in buttocks, trochanters, elbows, trunk, or in any tissue under pressure.<sup>12,14,16,18</sup> As for the distribution of the location of PU, the studies pointed out that there was a predominance of the sacral region and stage 2.<sup>13,18-19,21</sup>

The use of appropriate products is essential for the evolution of injury healing, since in one of the studies it was cited that only half of the patients with PU are treated with modern dressings.<sup>14</sup> Based on this observation, this conduct ends up influencing negatively in some aspects, such as increased costs for the institutions, as well as hospitalization time, hindering the recovery of the elderly.

A prolonged hospital stay longer than 10 days is a factor strongly associated with PU.<sup>20,25</sup> Similar results, also associated with the nosocomial rate, have been reported in other studies.<sup>15-16</sup> Thus, it can be noted that there is an increased risk for

the development of other complications, and it is also considered an aggravating factor in the incidence of PU.

It was found that prevention is also attributed to the use of scales. However, it is necessary to establish which scale is the most accurate in assessing the risk for PU. A risk assessment scale should have high specificity, sensitivity, and predictive ability, be quickly analyzed, and easily applicable in clinical practice, thus facilitating the establishment of conducts by professionals. The most widely used tool was the Braden scale, observed in eight studies.<sup>12-14,17-18,24-26</sup>

The Braden scale evaluates and accounts the etiological factors that contribute to the reduction of tissue tolerance to prolonged compression, by means of six sub-scales: sensorial perception, humidity, activity, mobility, nutrition, friction and shear. Through it, it is possible to know the individual risk of each patient adopting early preventive measures, according to the identified risk.<sup>33-34</sup>

Regarding the performance of the multiprofessional team, it is of fundamental importance in the prevention and treatment of PU in the elderly, and it must keep a complete record in medical records, from the characteristics of the PU, conducts, and treatments, aiming at the continuity of the measures adopted and the effectiveness of the treatment.<sup>16</sup> It is observed that, many times, the records in medical records do not present details about the measures to be taken, and it is important that the inclusion of the treatment in medical records is a concern of the whole team.

Thus, in addition to these aspects, the health professional is also responsible for passing on to caregivers the necessary orientations so that they can perform their functions as expected, improving the clinical picture of the elderly, especially those in situations of frailty, dependence, and immobility, thus reducing the incidence and prevalence of this disease.

## CONCLUSION

The present review made it possible to find relevant scientific evidence on PU, considered as a health problem that requires comprehensive and articulated care, constituting a serious problem commonly identified in the elderly in hospitals, home care, and those who remain in permanent institutions.

Thus, it becomes increasingly clear the importance of prevention by observing the clinical conditions, identifying risk factors, performing early intervention focusing on skin care, proper nutrition, change of decubitus and use of pressure relief devices, in order to reduce its incidence and minimize complications through the institution and implementation of reliable prevention strategies, aiming at a better quality of life for the elderly.

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