

Epidemiology, Etiology, and Pathophysiology of Incontinence-associated Dermatitis in Hospitalized Patients: Scope Review

Epidemiologia, Etiologia e Fisiopatologia da Dermatite Associada à Incontinência em Pacientes Hospitalizados: Revisão de Escopo
Epidemiología, Etiología y Fisiopatología de la Dermatitis Asociada a la Incontinencia en Pacientes Hospitalizados: Revisión de Alcance

RESUMO

Objetivo: Mapear os conceitos acerca da dermatite associada à incontinência (DAI) quanto sua epidemiologia, etiologia e fisiopatologia em pacientes hospitalizados. **Método:** Revisão de escopo seguindo as recomendações do Instituto Joanna Briggs (JBI) e do Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist. A estratégia de busca foi realizada nas bases de dados Pubmed, LILACS, SCielo, (BVS) Scopus, Embase, CINAHL, Cochrane, Web of Science. **Resultados:** Foram encontrados 551 estudos, dos quais 11 compuseram a amostra final. Em relação a epidemiologia da DAI, compreendeu-se que a incidência da DAI variou de 7,6% a 34,7%. A prevalência da DAI variou de 3,4% a 56,2%. Não foram obtidos resultados em relação à etiologia e fisiopatologia da DAI. **Conclusão:** Embora a literatura permita compreender sua distribuição e fatores associados, permanecem lacunas significativas quanto à compreensão dos mecanismos etiológicos e fisiopatológicos, reforçando a necessidade de novas investigações. **DESCRIPTORIOS:** Dermatite; Hospitalização; Incontinência Urinária; Incontinência Fecal.

ABSTRACT

Objective: To map the concepts regarding incontinence-associated dermatitis (IAD) in terms of its epidemiology, etiology, and pathophysiology in hospitalized patients. **Method:** Scoping review following the recommendations of the Joanna Briggs Institute (JBI) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist. The search strategy was carried out in the PubMed, LILACS, SciELO, VHL, Scopus, Embase, CINAHL, Cochrane, and Web of Science databases. **Results:** A total of 551 studies were identified, of which 11 comprised the final sample. Regarding IAD epidemiology, the incidence ranged from 7.6% to 34.7%. The prevalence of IAD ranged from 3.4% to 56.2%. No results were found regarding the etiology and pathophysiology of IAD. **Conclusion:** Although the literature allows understanding of its distribution and associated factors, significant gaps remain regarding the understanding of etiological and pathophysiological mechanisms, reinforcing the need for further research. **DESCRIPTORS:** Dermatitis; Hospitalization; Urinary Incontinence; Fecal Incontinence.

RESUMEN

Objetivo: Mapear los conceptos sobre la dermatitis asociada a la incontinencia (DAI) en cuanto a su epidemiología, etiología y fisiopatología en pacientes hospitalizados. **Método:** Revisión de alcance siguiendo las recomendaciones del Instituto Joanna Briggs (JBI) y de la lista de verificación Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR). La estrategia de búsqueda se realizó en las bases de datos PubMed, LILACS, SciELO, BVS, Scopus, Embase, CINAHL, Cochrane y Web of Science. **Resultados:** Se identificaron 551 estudios, de los cuales 11 compusieron la muestra final. En relación con la epidemiología de la DAI, la incidencia varió del 7,6% al 34,7%. La prevalencia de la DAI varió del 3,4% al 56,2%. No se obtuvieron resultados en relación con la etiología y la fisiopatología de la DAI. **Conclusión:** Aunque la literatura permite comprender su distribución y los factores asociados, persisten lagunas significativas en la comprensión de los mecanismos etiológicos y fisiopatológicos, lo que refuerza la necesidad de nuevas investigaciones. **DESCRIPTORIOS:** Dermatitis; Hospitalización; Incontinencia urinaria; Incontinencia fecal.

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INTRODUCTION

Incontinence-associated dermatitis (IAD) is characterized by erythema and edema of the superficial part of the skin, which may be accompanied by blisters, deterioration, serous exudates, and even secondary infection, with consequent pain and pruritus caused by exposure of the skin to urine and/or feces⁽¹⁻³⁾.

In addition, when the skin is exposed, there is an increase in tissue permeability, a decrease in barrier function, and external mechanical forces, which are evidenced by friction⁽⁴⁻⁵⁾.

The population most prone to developing IAD is male, with risk factors such as diabetes, high body mass index (BMI), fecal incontinence, and a higher degree of dependence and functional and physical disability. In addition, having constantly moist skin exposed to friction or shear forces during repositioning or mobilization is a major contributor to the development of the lesion⁽⁵⁾.

Approximately one-third of people with fecal incontinence develop IAD⁽⁶⁾. Previous studies have shown a prevalence of 5.6% to 50% of IAD depending on the population studied and type of environment, in addition to incidence rates between 3.4% and

25%⁽⁷⁾. Similarly, a study conducted with patients hospitalized in intensive care in the United States reported a prevalence of IAD of 27%⁽⁸⁾. Therefore, it is possible to observe a wide variety of prevalence and incidence of DAI in the literature, and most studies were conducted in chronic care units and were based on small samples. As a result, it is necessary to be aware of and cover studies in this area, given the need to understand the injury scientifically, in addition to improving this approach⁽⁴⁾.

In this sense, the etiology of DAI is complex and multifactorial, and related research is limited, as is research on its pathophysiology. In 2009, Dimitri et al. pointed out the influencing factors that are important in elucidating the pathophysiology of IAD to be investigated, such as the fact that the perineal environment is the injured site, the type of incontinence (urinary, fecal, or both), the volume and frequency of this incontinence, irritants, skin friction, and factors that impair the skin's barrier function⁽⁸⁾.

Previous studies have also suggested that describing the nature of AID would allow for the establishment and implementation of rational clinical actions and a clear definition. Additionally, an observation tool would result in a more systematic observation

of this lesion and improve the clarity of the investigation and applicability of the results in practice⁽⁸⁾.

Given the above, incontinence and consequent skin lesions have an immeasurable effect on the physical and psychological well-being of these patients⁽⁹⁾. Therefore, in order to diagnose and treat this health condition, it is necessary to elucidate the epidemiological, etiological, and pathophysiological concepts related to IAD, since at the time of this study, findings related to the details of these key concepts are still scarce, and little is known, especially about its etiology and pathophysiology⁽⁷⁾.

Thus, there is an important research gap to be explored. Therefore, the objective of this study is to map the conceptual aspects of DAI in hospitalized patients, focusing on epidemiology, etiology, and pathophysiology.

METHOD

This refers to a scoping review (SR) of the literature, which makes it possible to identify the available evidence, elucidating key concepts in the literature related to the central theme, providing a mapping of the available literature, thus allowing the context of the theme to be summarized and exposing the research gaps to be addressed and investigated⁽¹⁰⁾.

The study was guided by the Joanna Briggs Institute (JBI) methodology for scoping reviews⁽¹⁰⁻¹¹⁾ and described in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR⁽¹²⁾). The protocol was registered in the Open Science Framework (OSF), available at <https://doi.org/10.17605/OSF.IO/ZA964>.

To answer the research question and study objective, the PCC (Population, Concept, and Context) mnemonic

proposed by the JBI was used. Where: (P) Population: Patients of both sexes with no age limit; (C) Concept: Epidemiology, etiology, and pathophysiology of incontinence-associated dermatitis; (C) Context: Hospital. Therefore, the research question for this review is: what are the epidemiological, etiological, and pathophysiological concepts of incontinence-associated dermatitis in hospitalized patients?

Studies whose population consisted of patients of both sexes with no age limit, with the central question to be examined and admitted to a hospital unit, using various methodologies such as experimental and quasi-experimental studies, randomized and non-randomized clinical trials, interrupted time series studies, descriptive and analytical observational studies, prospective and retrospective cohort studies, case-control studies, cross-sectional studies, case series, and individual case reports, as well as theses, dissertations, technical notes, and case reports, as recommended in the scope review design. The exclusion criteria were studies that did not address the study objective and did not answer the research question, as well as advertisements, editorials, opinion articles, articles published in annals, and letters to the editor.

The search strategy was developed through the research question, using Health Sciences Descriptors (DeCS), Medical Subject Headings (MeSH), and Emtree (Embase subject headings), in addition to the Boolean operators AND and OR. The strategy consisted of cross-referenced descriptors in two versions, English and Portuguese. Each version was used in the databases according to the probabilities of retrieving better results and greater sensitivity in the search, and consequently meeting the requirements of the scope review according to the JBI manual⁽¹⁰⁾. There was no time or language limit so that it could

include national and international literature sources, and the online search took place between July and August 2024, using the journal portal of the Coordination for the Improvement of Higher Education Personnel (CAPES), with the assistance of the Virtual Private Network (VPN) of the São Paulo State University "Júlio de Mesquita Filho" (UNESP).

The usability of a range of databases is compatible with the method proposed by JBI and allows for the retrieval of study records appropriate for

answering the broad research question characteristic of a scoping review⁽¹⁰⁾. The databases were: PubMed, Scielo via Web of Science, Virtual Health Library (VHL), Latin American and Caribbean Health Science and Technical Information (LILACS), Scopus, Excerpta Medica dataBASE (Embase), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Cochrane, and Web of Science. The details of the search strategies used in each database are presented in Table 1.

Quadro 1. Estratégias de busca utilizadas nas diferentes bases de dados. Botucatu, SP, Brasil, 2024.

Bases de dados	Estratégias de busca
SciELO BVS L LILACS	(Urinary Incontinence OR Fecal Incontinence OR Fecal Escape OR Intestinal Incontinence OR Fecal Incontinence) AND (Dermatitis) AND (Hospitals OR Hospital Environment OR Hospital Center OR Hospital OR Nosocomial)
Cochrane Cinhal Scopus PubMed Embase Web of Scienc	("Urinary Incontinence" OR "Incontinence, Urinary" OR "bladder incontinence" OR "incontinence, urine" OR "incontinentia urinae" OR "involuntary urinary loss" OR "involuntary urination" OR "involuntary urine loss" OR "leakage of urine" OR "unwanted urine loss" OR "urinary leakage" OR "urine bladder incontinence" OR "urine leakage" OR "wetting, urine" OR "urine incontinence" OR "Fecal Incontinence" OR "Incontinence, Fecal" OR "Bowel Incontinence" OR "Incontinence, Bowel" OR "Fecal Soiling" OR "Soilings, Fecal" OR "anal incontinence" OR "anus incontinence" OR "bowel incontinence" OR "defecation incontinence" OR encopresia OR encopresis OR encopresy OR "excretory incontinence" OR "faecal incontinence" OR "faeces incontinence" OR "fecal incontinence" OR "fecal incontinuity" OR "incontinence, anal" OR "incontinentia alvi" OR "intestinal incontinence" OR "rectal incontinence" OR "rectum incontinence" OR "stool incontinence" OR "feces incontinence") AND (Dermatitis OR Dermatitides OR "chronic dermatitis" OR "cutaneous inflammation" OR "dermal inflammation" OR dermatitis OR "eczematous skin diseases" OR epidermitis OR "inflammatory dermatosis" OR "inflammatory skin disease" OR "skin diseases, eczematous" OR "skin inflammation") AND (Hospitals OR Hospital)

Source: Research data, 2024.

After searching the databases, studies were selected using the Rayyan® tool. Initially, titles and abstracts were read, and duplicate articles were excluded. Then, the texts were read in full, respecting the eligibility criteria of this review, as well as the criteria of the PRISMA-Sc Checklist⁽¹²⁾. Furthermore, the selected articles were ana-

lyzed by two independent reviewers, and any discrepancies were analyzed by a third reviewer in order to systematize and reduce research bias. The flowchart for this strategy is shown in Figure 1.

Data extraction and capture of the necessary information were performed using a tool developed for this review. The first part of the tool

contained data such as authors, year of publication, original title, study design, and objectives. The second part of the tool allowed for the organization of the population, setting, and main results to answer questions about the epidemiology, etiology, and pathophysiology of incontinence-associated dermatitis, and no changes to the strategy were necessary.

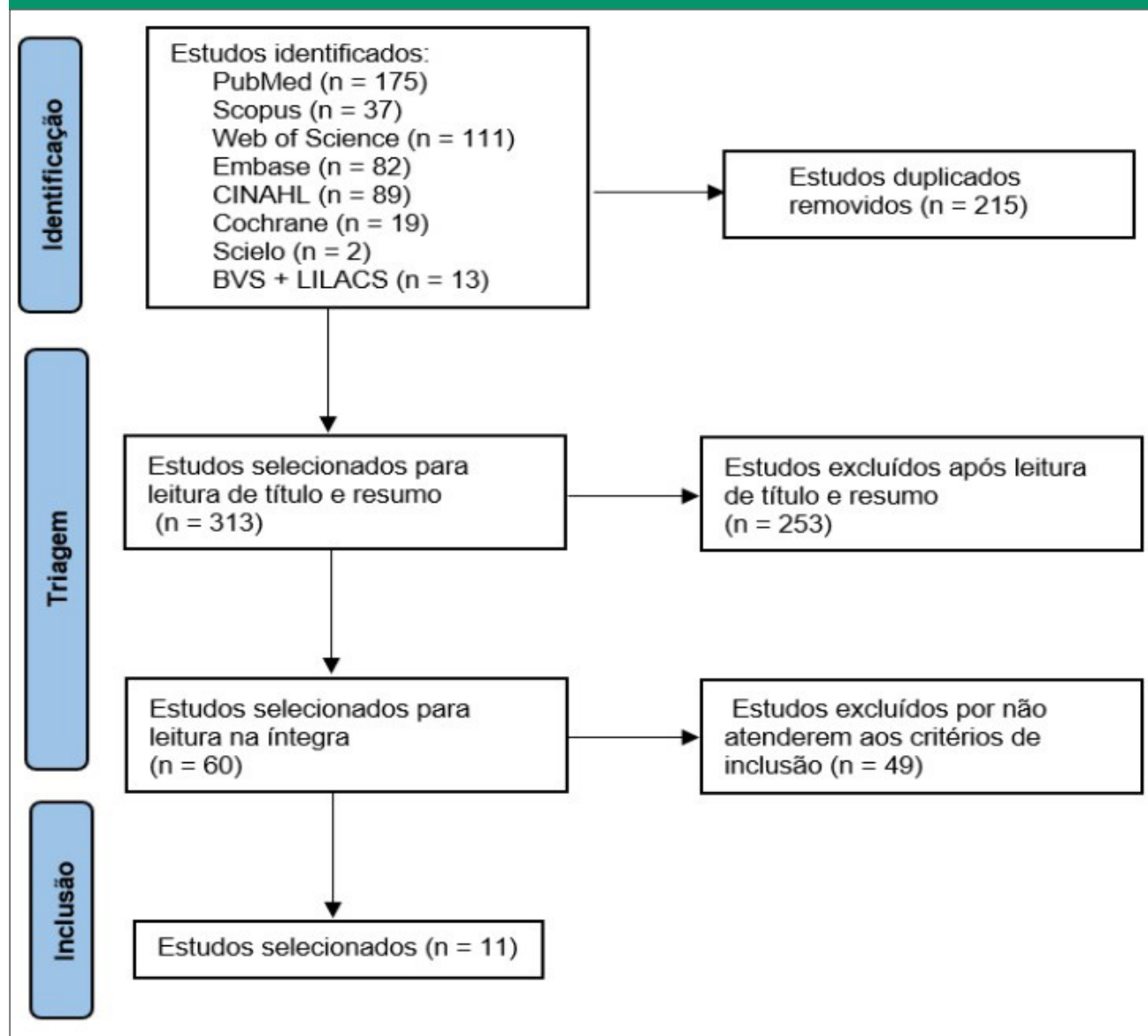
Considering that this is a review study based on publicly available data and does not involve human subjects, approval by the Research Ethics Committee was waived.

RESULTS

The search performed using the proposed strategies resulted in the

identification of 551 studies, which, after applying the eligibility criteria, resulted in eleven studies in this review. Figure 1 presents the PRISMA-Scr flowchart, detailing the selection and screening process of the studies included in the review.

Figure 1. PRISMA-Scr flowchart for study selection. Botucatu, SP, Brazil, 2024.



Source: Research data, 2024.

Among the 11 studies included in the final sample of the review, all focused on the epidemiology of IAD. No studies were identified whose results focused on the etiology or pathophysiology of this condition.

Of the studies analyzed, six were international, coming from Spain, the United States, Wales, and China. The remaining studies were conducted in Brazil. The Brazilian articles were

available in Portuguese, while among the international studies, four were written in English and two in Spanish.

The included studies were published between 2012 and 2024. The following distribution was observed: 2012 (n=1), 2016 (n=1), 2017 (n=1), 2018 (n=3), 2020 (n=3), 2022 (n=1), and 2024 (n=1).

When analyzing the thematic focus of the included articles, it was

observed that the majority (n=8) had IAD as their main object of study. The others (n=3) primarily addressed pressure injuries, with IAD being treated as a secondary issue. Table 2 presents details of the selected studies, including authors, year of publication, title, methodological design, study location, and objective.

Table 2. Characterization of the studies included in the review. Botucatu, SP, Brazil, 2024.

Authors/Year/Reference	Title	Type of study	Study location	Objective
Long et al., 2012 ⁽¹³⁾	Incontinence-Associated Dermatitis in a Long-term Acute Care Facility	Longitudinal	United States	To measure the prevalence of IAD and pressure injuries at admission to a long-term acute care facility
Chianca et al., 2016 ⁽¹⁴⁾	Incontinence-associated dermatitis: a cohort study in critically ill patients	Cohort	Brazil	Estimate incidence, determine risk factors, and propose a risk prediction model for the development of IAD in critically ill adult patients
Clark et al., 2017 ⁽¹⁵⁾	National audit of pressure ulcers and incontinence-associated dermatitis in hospitals across Wales: a cross-sectional study	Cross-sectional	Wales	Identify the prevalence of pressure injuries and IAD
Wang et al., 2018 ⁽¹⁶⁾	Incidence and Risk Factors of Incontinence-associated Dermatitis among Patients in the Intensive Care Unit	Prospective cohort	China	Investigate the incidence of IAD among patients in the intensive care unit and identify possible risk factors in order to establish a reference for clinical nursing practice
Ferreira et al., 2018 ⁽¹⁷⁾	Incontinence-associated dermatitis in the elderly: prevalence and risk factors	Cross-sectional exploratory	Brazil	Determine the prevalence and risk factors for IAD in the elderly
Pérez- Acevedo et al., 2018 ⁽¹⁸⁾	Prevalence of pressure injuries, incontinence, incontinence-associated dermatitis, and risk factors for the development of pressure injuries in a tertiary maternity and children's hospital	Cross-sectional	Spain	To determine the prevalence of pressure injuries, incontinence, IAD, and risk factors for pressure injuries in a tertiary-level university maternity and children's hospital
Belini et al., 2020 ⁽¹⁹⁾	Prevalence of incontinence-associated dermatitis in adult patients at a university hospital	Descriptive and cross-sectional	Brazil	Identify the point prevalence and characteristics of IAD in adult patients admitted to the medical clinic of a general hospital
Meirelles et al., 2020 ⁽²⁰⁾	Incidence of incontinence-associated dermatitis in patients in a	Prospective cohort	Brazil	To identify the incidence of IAD and risk factors in patients in a clinical inpatient unit
Grdenl et al., 2020 ⁽²¹⁾	Incontinence-associated dermatitis in elderly patients admitted to a university hospital	Cross-sectional	Brazil	Identify the prevalence and factors associated with IAD in elderly patients
Domingues et al., 2022 ⁽²²⁾	Incontinence-associated dermatitis: prevalence and associated factors in an intensive care unit	Cross-sectional, observational, and retrospective	Brazil	To analyze the point prevalence of IAD and associated factors in adult patients admitted to intensive care units
Balaguer- López et al., 2024 ⁽²³⁾	Incidence of incontinence-associated dermatitis in hospitalized neonates. Adaptation and validation of a severity scale	Observational, prospective, and multicenter	Spain	Adapt the Clinical Assessment Scale for Characterizing the Severity of Diaper Dermatitis to the Spanish context and investigate the national magnitude of DI in hospitalized neonates

Source: Research data, 2024.

Table 3 presents a detailed summary of the articles included in the analysis, with information on the characteristics of the sample studied,

epidemiological data, and the main outcomes observed. This organization aims to provide a clear and concise overview of the key elements of each

study, facilitating understanding of the results found.

Quadro 3. Caracterização dos estudos com relação a amostra, epidemiologia e desfecho. Botucatu, SP, Brasil, 2024.

Author/Year/Reference	Sample	Epidemiology	Outcomes
Long et al., 2012(13)	171 patients in long-term acute care units	Prevalence of 22.8% Incidence of 7.6%	The prevalence of ADI on admission to long-term acute care units was similar to that observed in acute care units, but substantially higher than that observed in long-term care
Chianca et al., 2016(14)	157 patients in intensive care units	Incidence of 20.4%	IAI is a preventable condition through the adoption of an effective preventive approach. This study aims to contribute to the qualification of care focused on the prevention of IAI in patients admitted to adult intensive care units, promoting safer and better quality nursing care
Clark et al., 2017(15)	8,365 patients from 66 hospitals	Prevalence of 4.3%	The research demonstrated the feasibility of conducting national surveys on pressure injuries, IAD, and other wounds, showing that, despite the complexity, it is possible to obtain accurate data to support the planning of improvements in wound care in Wales
Wang et al., 2018(16)	109 intensive care unit patients	Incidence of 23.9%.	IAD is a frequent complication in critically ill patients, compromising quality of life, causing pain, and increasing the workload of nursing staff. There is a need to train professionals to improve the distinction between IAD and pressure injuries, recognize risk factors, and adopt preventive interventions for skin integrity care
Ferreira et al., 2018(17)	138 patients in clinical and surgical hospitalization, long-term care unit	Prevalence of 36.4% in the medical clinic Prevalence of 25% in surgical clinics	High prevalence of IUD, with greater risk among patients hospitalized for more than 15 days, obesity, high dependency, and very high risk classification on the Braden Scale, highlighting the need for early identification, monitoring of risk factors, and implementation of preventive measures
Pérez-Acevedo et al., 2018(18)	263 pediatric and neonatal intensive care patients, pediatric and adult clinical unit	Prevalence of 8.3% in pediatric intensive care units Prevalence of 3.4% in pediatric inpatient units	It is recommended to continue working on two key safety aspects related to pediatric nursing care: pressure injuries and incontinence. The importance of implementing systems for reporting and monitoring these adverse events is highlighted, in addition to developing a specific theoretical framework for DAI in pediatrics, in order to guide more effective preventive practices
Belini et al., 2020(19)	16 patients in a medical clinic	Prevalence of 56.2%	High prevalence of IAD, with a higher occurrence in women, although incontinence is more frequent among men. Double incontinence was the most prevalent type. Although several pathologies were observed, it was not possible to establish a correlation between these conditions, incontinence, and the development of IAD
Meirelles et al., 2020(20)	197 patients in the clinical inpatient unit	Incidence of 20.3%	The incidence of AID was considered high, especially since this was not a population in critical care. The risk increased in elderly patients, those using enteral tubes, those with prolonged hospitalizations, those using diapers, those dependent on eliminatory care, those with liquid stools, those using certain medications, and those hospitalized for mental or behavioral disorders or external traumatic causes. The need for effective nursing interventions with the skin is highlighted
Grdenl et al., 2020(21)	202 patients in inpatient units	Prevalence of 9.41%	The study identified an average prevalence of IAD in the elderly, highlighting associated factors such as the use of nasoenteral tubes, medical devices, restricted mobility, prolonged hospitalization, and cognitive impairment. The findings reinforce the importance of continuous strategies for the prevention, assessment, and monitoring of IAD

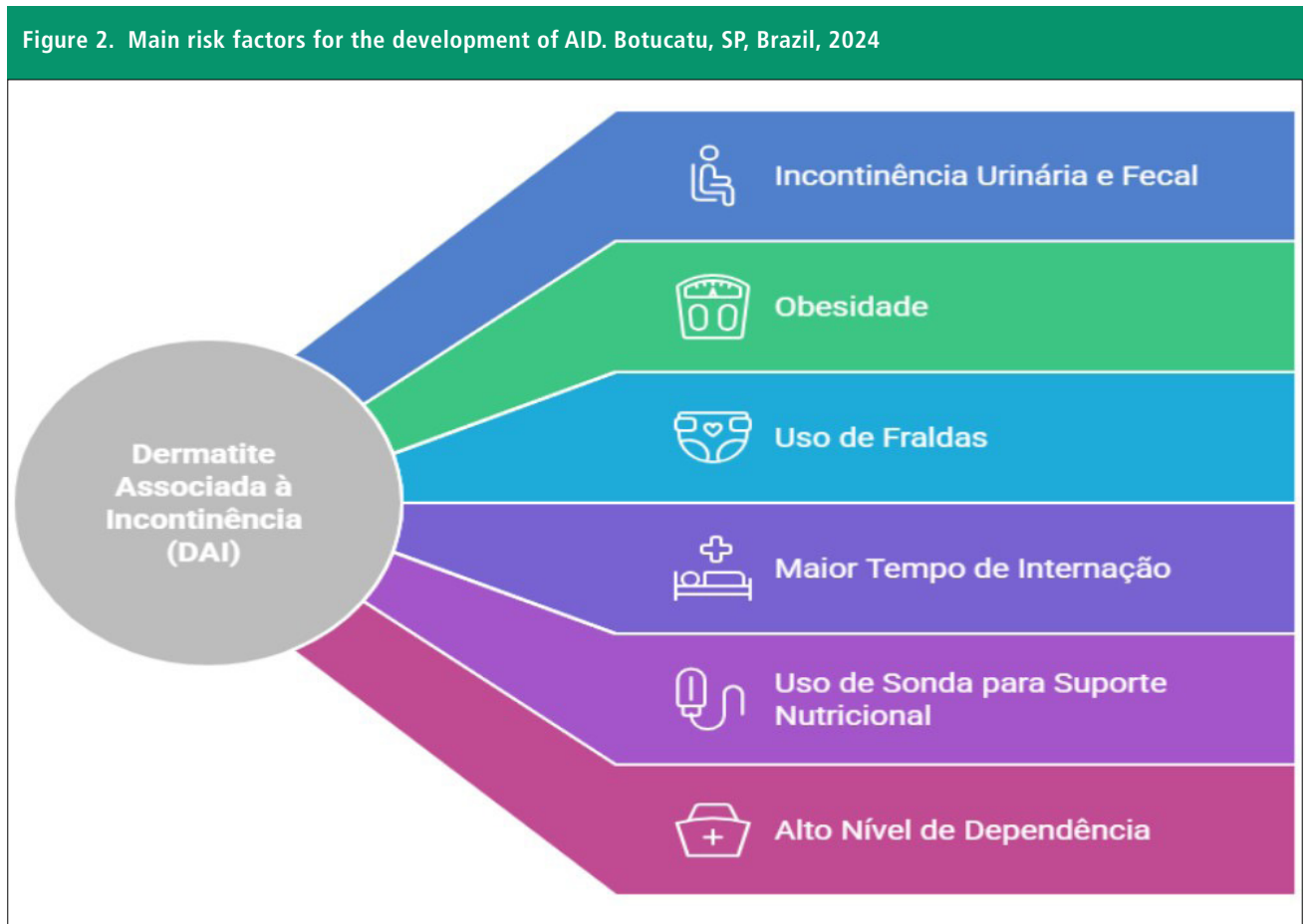
Domingues et al., 2022(22)	105 intensive care unit patients	Prevalence of 9.5%	Prevalence of AID of 9.5% in adult intensive care patients, and the factor associated with its occurrence was the type of admission to the ICU, highlighting admission due to trauma. It is important to investigate the epidemiology and factors associated with AID, as it can affect patient well-being and the care process. Conducting studies on IAD is essential to improve nursing practice and ensure more effective and structured care.
Balaguer-López et al., 2024(23)	196 neonatal patients	Incidence of 34.7%	As neonates progress in their development, there is an increase in bowel movements and urination, raising the risk of IAD due to greater exposure to irritants. Factors such as increased bowel movements, mixed feeding, the use of oral medications, and the application of local devices in the perianal region contribute to the risk of diaper dermatitis. Preventive use of barrier products is recommended, but these products are more commonly applied after lesions appear. The use of clinical assessment scales can facilitate early detection of IAD, allowing early intervention with products that prevent lesions from progressing to more severe stages.

Source: Research data, 2024.

Figure 2 presents the six main risk factors identified in the articles selected for this review, which are strongly associated with the development of IAD. These factors were extracted

from a careful analysis of the studies reviewed and represent the conditions most frequently observed in the onset and progression of IAD. The analysis includes both intrinsic factors, such as the patient's physiological charac-

teristics, and extrinsic factors related to the environment and incontinence management, reflecting the multifactorial complexity of the condition.



Source: Image created with the help of the Napkin AI tool, 2024⁽²⁴⁾

DISCUSSION

In the studies retrieved, it can be noted that there is a wide variation in the incidence and prevalence of IAD epidemiology, and in the samples studied, the incidence ranged from 7.6%⁽¹³⁾ to 34.7%⁽²³⁾. Similarly, the observed prevalence drew even more attention due to the large difference, ranging from 3.4%⁽¹⁸⁾ to 56.2%⁽¹⁹⁾.

The reasons behind this significant difference between the lowest and highest incidence and prevalence rates can be explained by the wide variability in the setting chosen for the studies, where certain researchers conducted their data collection in intensive care units^(13-14,16,23,22) and others in inpatient units/wards^(15,17,19,20-21,25). The population of the samples studied also varied widely, ranging from neonatal patients^(13,18,23), pediatric patients⁽¹⁸⁾, adults⁽¹⁴⁻¹⁵⁻¹⁶⁻¹⁷⁻¹⁸⁻¹⁹⁻²⁰⁻²¹⁻²²⁾ and the elderly^(17,19,21,25) demonstrating that different populations and settings can significantly alter prevalence and incidence rates, suggesting the need for specific studies for each population.

Furthermore, in our findings, we observed high incidence rates of AID in patients who were admitted to the ICU (20.4%)⁽¹⁴⁾, (23.9%)⁽¹⁶⁾, (34.7%)⁽²³⁾. The average onset of DAI in patients is only 4 days after admission, so it is necessary for healthcare teams to have the knowledge to identify and manage DAI early, so that they can start treatment as soon as possible to prevent the injury from progressing to a more severe category⁽²⁶⁾.

Previous studies have shown that an important risk factor for the development of DAI is extreme age⁽¹⁴⁾. In studies conducted in the adult population, it was found that DAI affects the elderly more frequently due to the fragility of their skin, making it more susceptible to the development of lesions⁽⁴⁾ especially if they are hos-

pitalized in long-term care facilities or intensive and semi-intensive care units⁽²⁷⁾.

The prevalence of complications related to IAD also increases in the elderly as they are previously affected by urinary, fecal, or double incontinence⁽²⁸⁾. In our results, we observed higher prevalence rates from a study conducted with adult and elderly patients (56.2%)⁽¹⁹⁾. Similarly, children's skin is also fragile and more likely to develop IAD, in this case due to natural incontinence during the development of adequate sphincter control and skin immaturity, which makes it more susceptible to lesions from contact with incontinence and abrasions from cleaning⁽¹⁸⁾. Studies report that patients with fecal incontinence are more likely to develop AID than patients who only have urinary incontinence^(1,29-30). This fact can be explained by the irritating nature of feces when in contact with the skin, especially if they are soft or watery, increasing the severity of AID⁽⁷⁾.

Similarly, it has been shown that patients with critical illnesses are more likely to develop AID due to physiological aspects and pathophysiological threats, which together cause diarrhea⁽²⁹⁾.

In this sense, regarding etiology and pathophysiology, we did not obtain significant results in our sample that could be presented in this study, demonstrating an important research gap to be addressed in future studies. And although the included studies did not present data on the etiology and pathophysiology of AID, these data were able to relate several factors associated with or at risk for its development, which we highlight below.

In newborns, the most important factors were: increased frequency of bowel movements, mixed feeding, oral medications, or the use of medical devices in the perianal region (collection bags), demonstrating the

importance of prevention with barrier products⁽²³⁾. Another study showed that most patients with IAD were women (55.6%), over 70 years of age (44.4%), and (66.7%) with double incontinence⁽¹⁹⁾.

The findings reinforce the greater susceptibility of the elderly population to developing IAD^(14,21) and the impact of exposure to double incontinence on affecting the skin^(13,16,19,28). The reason for hospital admission due to trauma was also highlighted as an associated factor⁽²⁰⁾, due to the patient's lack of mobility and consequent greater exposure to incontinence^(31,32).

Furthermore, patients with a history of previous neoplasia, a high number of episodes of fecal incontinence and diaper changes per day, complaints of burning, itching, pain, presence of reactive erythema, erosion, and fungi were characterized as risk factors for developing IAD⁽¹⁴⁾. Longer hospital stays were also an important factor in the onset of IAD^(17,20,21), as was obesity,^(13,17) greater dependence on care and/or restricted mobility,^(17,20,21) and altered scores on the Braden scale⁽¹⁶⁻¹⁷⁾. In addition, other relevant factors were: use of nasogastric tube^(20,21), use of medical devices, cognition⁽¹⁴⁾, hospitalization for diseases categorized as Mental and Behavioral Disorders, use of diapers, liquid stools⁽²¹⁾, use of soap/water and towel for cleaning⁽¹³⁾, and use of certain types of medication (corticosteroids, vasodilators, cardiac glycosides, antifungals, or antidiarrheals)⁽²¹⁾.

The points found highlight the impact that hospitalization and its consequences can have on the patient's quality of life, in addition to showing the importance of being aware of the risk factors/factors associated with IAD, in order to establish preventive measures and improve the teams' knowledge of early detection.

In addition to all the harm that ADI can cause to the patient in relation to

the injury itself, there is also the relationship between longer hospitalization, increased readmission rates, a large increase in the probability of developing LP or worsening existing ones, which culminate in an increase in the overall total cost of hospital treatment⁽³³⁾.

Finally, another important topic in the discussion on DAI is the lack of widely used and standardized tools to measure skin damage, which leads to considerable subjectivity in the researcher's assessment. In addition, DAI is often misdiagnosed as LP, which causes a significant limitation in comparing the levels of findings between different studies⁽³⁴⁻³⁵⁾. Thus, it is clear that new studies are needed to standardize instruments that can be

widely used and disseminated, leaving another research gap open.

An important limitation of this research was the unavailability of the full text of some studies that could elucidate the etiological factors and the role of the DAI in the diagnosis of LP. Full text of some studies that could elucidate the etiological and pathophysiological factors of IAD.

CONCLUSION

Therefore, this scoping review allowed us to map and clarify the main epidemiological concepts related to DAI, contributing to the systematization of available knowledge about its prevalence/incidence, associated factors, and most affected popula-

tions. However, a significant gap was observed in the literature regarding the understanding of the etiological and pathophysiological aspects of DAI. The absence of in-depth studies on these components limits the construction of a solid basis for the development of more effective therapeutic and preventive approaches.

Given this scenario, there is a clear need for future research that rigorously and comprehensively explores the etiology and pathophysiological mechanisms involved in DAI. The generation of scientific evidence in these areas is fundamental for advancing knowledge, improving clinical practice, and strengthening evidence-based care strategies, contributing to the safety and quality of life of affected patients.

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