REVISTA ENFERMAGEM ATUAL IN DERME

SKIN LESION RELATED TO THE USE OF MEDICAL ADHESIVES (MARSI): INTEGRATIVE REVIEW

LESIÓN CUTÁNEA RELACIONADA CON EL USO DE ADHESIVOS MÉDICOS (MARSI): REVISIÓN INTEGRADORA

LESÃO CUTÂNEA RELACIONADA AO USO DE ADESIVOS MÉDICOS (MARSI): *REVISÃO INTEGRATIVA*

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ABSTRACT
Introduction: Medical Adhesive Related Skin Injury (MARSI) is characterized by the presence of erythema and/or other skin abnormalities, such as vesicles, blisters, erosion and skin rupture, persisting for 30 minutes or more after removal of the adhesive. These injuries are classified into three types: mechanical, dermatitis and others. **Objective:** To identify the incidence and prevalence of Medical Adhesive Related Skin Injury – MARSI, and the scientific evidence that can support prevention. **Method:** Integrative review with search in databases: CINAHL, PubMed, Scopus, VHL and Web of Science, carried out in February/2024, based on the question in the PICo acronym model. **Results:** Final sample included 14 articles, published between 2019 and 2023. The studies were characterized for analysis in groups, namely: in the care group for MARSI prevention, six studies (42.85%), in the incidence group, four studies (28.57%), in the incidence and preventive care group, two studies (14.28%), in the prevalence group, two studies (14.28%). A prevalence of 22.7% in critically ill patients was observed, the highest incidence was 34.6%, with mechanical injury being the cause of MARSI. As for care, studies have brought prevention with the application of a barrier film before the adhesive, applying removers before removing to avoid pain and MARSI. They also suggest training the team regarding the technique of applying and removing stickers. **Conclusion:** To prevent MARSI, it is necessary to qualify the care team regarding the care in choosing the adhesive.
Keywords: Adhesive; Wounds and Injuries; Nursing care; Stomatherapy.

RESUMEN
Introducción: Lesiones cutáneas asociadas a adhesivos médicos (Medical Adhesive Related Skin Injury – MARSI) caracterizan por presencia de eritema y/u otras anomalías en la piel, como vesículas, ampollas, erosión y rotura de la piel, que persisten durante 30 minutos o más después de quitar la pegatina. Estas lesiones se clasifican en tres tipos: Mecánicas, dermatitis y otras. **Objetivo**: Identificar la incidencia y prevalencia de Lesiones Cutáneas Relacionadas con Adhesivos Médicos – MARSI, y la evidencia científica que puede apoyar prevención. **Método:** Revisión integrativa con búsqueda en bases de datos: CINAHL, PubMed, Scopus, VHL y Web of Science, realizada en febrero/2024, a partir de la pregunta del modelo de siglas PICo. **Resultados:** Muestra final incluyó 14 artículos, publicados entre 2019 y 2023. Estudios caracterizaron para el análisis en grupos, a saber: en el grupo de atención para la prevención MARSI, seis estudios (42,85%), en el grupo de incidencia, cuatro estudios (28,57%), en grupo de incidencia y cuidados preventivos, dos estudios (14,28%), grupo de prevalencia, dos estudios (14,28%). Se observó una prevalencia del 22,7% en pacientes críticos, mayor incidencia fue del 34,6%, siendo lesión mecánica causa de MARSI. En cuanto a los cuidados, los estudios han traído la prevención con la aplicación de una película barrera antes del adhesivo, aplicando removedores antes de retirar para evitar dolores y MARSI. También sugieren capacitar al equipo sobre técnica de aplicación y eliminación de stickers. **Conclusión:** Prevenir MARSI es necesario capacitar equipo de atención en cuanto al cuidado en elección del adhesivo.
Palabras clave: Adhesivos; Heridas y Lesiones; Cuidado de Enfermera; Estomaterapia.

RESUMO
Introdução: A lesão de pele associada a adesivos médicos (*Medical Adhesive Related Skin Injury* – MARSI), é caracterizada pela presença de eritema e/ou outras anormalidades na pele, como vesículas, bolhas, erosão e ruptura cutânea, persistindo por 30 minutos ou mais após a remoção do adesivo. Essas lesões são classificadas em três tipos: Mecânico, dermatite e outros. **Objetivo**: Identificar a incidência e a prevalência da *Medical Adhesive Related Skin Injury* – MARSI, e as evidências científicas que possam subsidiar a prevenção. **Método:** Revisão integrativa com busca nas bases dados: CINAHL, PubMed, Scopus, BVS e *Web of Science*, realizada em fevereiro/2024, a partir da pergunta no modelo acrônimo PICo. **Resultados:** Amostra final incluiu 14 artigos, publicados entre 2019 e 2023. Os estudos foram caracterizados para análise em grupos, a saber: no grupo de cuidados para prevenção de MARSI, seis estudos (42,85%), no grupo incidência, quatro estudos (28,57%), no grupo incidência e cuidados preventivos dois estudos (14,28%), no grupo prevalência, dois estudos (14,28%). Observou-se prevalência em pacientes críticos 22,7%, a maior incidência foi de 34,6% sendo a causa de MARSI a lesão mecânica. Quanto aos cuidados, estudos trouxeram prevenção com aplicação de película barreira antes do adesivo, aplicar removedores antes de remover para evitar dor e MARSI. Também sugerem treinamento da equipe quanto a técnica de aplicação e remoção de adesivos. **Conclusão:** Prevenir MARSI é necessário qualificar a equipe assistencial quanto aos cuidados na escolha do adesivo.
Palavras-Chaves: Adesivos; Ferimentos e lesões; Cuidados de Enfermagem; Estomaterapia.

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INTRODUCTION

Medical Adhesive Related Skin Injury (MARSI) was defined in the United States in 2013 by McNichol and colleagues. Medical Adhesive Related Skin Injury is characterized by the presence of erythema and/or other skin abnormalities, such as vesicles, blisters, erosion, and skin rupture, persisting for 30 minutes or more after removal of the adhesive. These injuries are classified into three types: Mechanical, dermatitis, and others[1].

In Brazil, in 2023, the translation, cross-cultural adaptation, and content validation of the Medical Adhesive Related Skin Injury (MARSI) classification instrument into Portuguese were carried out. However, the expression "medical adhesive" generated significant disagreements between judges and translators, leading to a reduction in the Content Validity Index (CVI) values. Some judges suggested the term "adhesive supplies", arguing that adhesives are not exclusively for medical use. However, after discussions with the focus group, the selected translation remained "adhesivos Médicos", as it is a well-known and accepted term in Brazil, as is the expression "lesão por pressão relacionados ao dispositivo Médico". Another important point of discussion was the terminology "skin (epidermal) stripping", which led some judges to suggest the use of "removal superficial da pele (epidermis)". However, this terminology was also modified during the discussions in the focus group. In the end, it was chosen to use desnudação da epidermis[2].

MARSI is considered a sentinel event in the scenario of care for hospitalized patients, as it is understood that maintaining skin integrity is an important indicator of the quality of care in health facilities. Although often underestimated, skin injuries related to medical adhesives are significant and still have the potential to impact patient outcomes, satisfaction and safety. It is known that medical adhesives are widely used in health care settings, and they cover a significant variety of products, such as: tapes; dressings; electrodes; barriers for stomas; among other adhesives used to fix devices to the skin, monitor patients non-invasively, perform secondary wound coverage, approximate the edges of lesions and promote the skin healing process10.

The epidermis serves as the body's physical defense against the external environment. However, when moisture or trauma damage the outer layer of the skin, its protective capacity is compromised, which can result in pain, injury, infection or even delayed healing. The skin also plays a role in regulating body temperature and pressure, in addition to contributing to the body's homeostasis, since it receives about a third of the circulating blood volume and prevents the loss or excessive absorption of fluids. Thus, when exposed to high levels of humidity, the skin tends to soften, swell and wrinkle, becoming susceptible to damage from friction4.

Finally, it is stated that MARSI is a clinically significant and potentially preventable event. A study conducted in Guangxi, China (2017) revealed the occurrence of MARSI at

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catheter insertion sites in cancer patients, pointing to independent risk factors that support the identification of the elderly as a high-risk population for the occurrence of these injuries. In the elderly, there is a thinning of the junction between the epidermis and dermis, as well as a reduction in collagen and elastin, making the skin more susceptible to mechanical and friction injuries when exposed to adhesives. In addition, the skin of the elderly has a reduced response to the growth factors necessary for the healing process to begin, due to reduced perfusion, a fact that can delay the repair and healing of the skin barrier[3].

Given the scenario presented, it is concluded that it is important to know both the incidence and prevalence of MARSI in the adult population and hospitalized elderly people, as well as the scientific evidence already produced in primary articles, to support the standardization of preventive actions for MARSI, with regard to skin care for receiving the patch, how to apply it, and remove it properly and safely.

METHODS

This study consists of an integrative literature review, which allows the exploration of the results of original primary studies, listing information for the knowledge of those interested in the topic and to support the safe and preventive care of MARSI.

The integrative review comprises the following development stages: 1) Identification of the problem; 2) Literature search; 3) Data evaluation; 4) Analysis of results and 5) Presentation of the review7.

To ensure the maintenance of methodological rigor, from the beginning of the research to publication, the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses – PRISMA8 were carefully applied.

The research question was developed with the support of the acronym PICo: P (Population) - hospitalized adult and elderly patients, using devices and patches and with MARSI; I (Phenomenon of interest) - Care for prevention; incidence and prevalence of MARSI; Co (context) - hospital 9. Thus, the research was developed based on the following question: What is the incidence, prevalence and care for preventing skin lesions caused by the use of medical adhesives in hospitalized adult and elderly patients?

For the literature search, keywords applicable to the specificities of the topic were used and, to broaden the scope of the research, since there are no specific descriptors in DeCs - Health Science Descriptors, the terms were associated with the Boolean operators AND and OR. With the support of a librarian, with his experience in researching the main databases, strategies were constructed for each database, as shown in Table 1. There was support from a librarian, with his experience in researching the main databases, and strategies were constructed for each database, as shown in Table 1. The terms used in the search were adapted as necessary, for each database, always paying

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attention to the research question and the inclusion and exclusion criteria outlined for the research.

Table 1 - Databases according to search strategies and number (n) of articles, Curitiba, PR, Brazil, 2024

Databse	Search Strategies	(n)
PubMed	('medical adhesive related skin injury') AND ((skin/exp. OR 'cutis' OR 'derma' OR 'human skin' OR 'skin' OR 'skin layer') OR ('skin infection'/exp OR 'cutaneous infection' OR 'cutaneous infectious disease' OR 'dermal infection' OR 'infection of the skin' OR 'infection, skin' OR 'infectious disease of the skin' OR 'infectious skin diseases' OR 'skin diseases, infectious' OR 'skin infection')) AND ('hospital patient'/exp OR 'hospital patient' OR 'hospitalised patient' OR 'hospitalised patients' OR 'hospitalized patient' OR 'hospitalized patients' OR 'in-hospital patient' OR 'in-hospital patients' OR 'in-patient' OR 'in-patients' OR 'inpatient' OR 'inpatients' OR 'patient, hospital')	44
Scopus	('medical adhesive related skin injury') AND ((skin/exp OR 'cutis' OR 'derma' OR 'human skin' OR 'skin' OR 'skin layer') OR ('skin infection'/exp OR 'cutaneous infection' OR 'cutaneous infectious disease' OR 'dermal infection' OR 'infection of the skin' OR 'infection, skin' OR 'infectious disease of the skin' OR 'infectious skin diseases' OR 'skin diseases, infectious' OR 'skin infection')) AND ('hospital patient'/exp OR 'hospital patient' OR 'hospitalised patient' OR 'hospitalised patients' OR 'hospitalized patient' OR 'hospitalized patients' OR 'in-hospital patient' OR 'in-hospital patients' OR 'in-patient' OR 'in-patients' OR 'inpatient' OR 'inpatients' OR 'patient, hospital')	148
BVS	(("medical adhesive related skin injury")) AND (((skin OR "cutis" OR "derma" OR "human skin" OR "skin" OR "skin layer") OR ("skin infection" OR "cutaneous infection" OR "cutaneous infectious disease" OR "dermal infection" OR "infection of the skin" OR "infection, skin" OR "infectious disease of the skin" OR "infectious skin diseases" OR "skin diseases, infectious" OR "skin infection"))) AND (("hospital patient" OR "hospital patient" OR "hospitalised patient" OR "hospitalised patients" OR "hospitalized patient" OR "hospitalized patients" OR "in-hospital patient" OR "in-hospital patients" OR "in-patient" OR "in-patients" OR "inpatient" OR "inpatients" OR "patient, hospital")) AND adults AND (elderly OR aged)	73
CINAHL	medical adhesive related skin injury	119
Web of Science	medical adhesive related skin injury	42

Source: The authors (2024).

The bibliographic research was carried out from February 2 to 11, 2024, using the journal portal of the Coordination for the Improvement of Higher Education Personnel (CAPES), of the Ministry of Education (MEC), through the Federal University of Paraná. The following databases were consulted: Cumulative Index to Nursing and Allied Health Literature (CINAHL); U.S. National Library of Medicine (PubMed); Scopus; Virtual Health Library (BVS); and Web of Science (WOS). In the CINAHL and WOS databases, only the keywords Medical Adhesive Related Skin Injury were used, due to the specificity of the topic.

The researchers who searched for and selected the articles are nurses, specialists in Dermatology Nursing, and in Stomatherapy, one of whom has a doctorate, therefore, they have knowledge in the area of this study. To define the sample, both researchers established and

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applied the inclusion criteria, such as the type of study, which sought to be primary, consensus or expert recommendation; with quantitative, qualitative or mixed research methods; which included an adult or elderly population, over 18 years of age, published electronically between 2019 and 2024; the cut-off for the last five years was aimed at searching for recent evidence, available in full in indexed journals, in article format, regardless of the language (with the possibility of translation). And also, the approach to the incidence and prevalence of skin lesions related to the use of medical adhesives, and skin care to prevent their occurrence in hospitalized adults and elderly people, that is, in the hospital context.

After searching the databases, the researchers used the Rayyan reference management tool, available online. On this platform, the articles were selected independently by peers and blindly, by reading the title and abstract, and then transferred to an Excel® spreadsheet. The articles that presented divergences underwent a consensus discussion to decide whether or not to include them. Subsequently, the selected articles were read in full.

The study selection process followed the recommendations of the Statement for Reporting Systematic Review and Meta-Analyses of Studies – PRISMA checklist, and the recommended flowchart was structured as shown in figure 1.

To organize and analyze the selected studies, an information matrix was used, containing the following elements: alphanumeric identification of the article, specifying P as prevalence article, I as incidence, C as care, IC as incidence and care, letters that were followed by a number that identifies the order and quantity of each category, followed by the reference number in which it is presented in the final list of the article, examples: P1; I4; C5; IC2. Next, the next columns present: authorship and year of publication; method and sample; intervention and types of adhesives used; objective of the study; findings; and the level of evidence of the study.

As the included articles were read, they were analyzed and the information that answered the research question (called main results) and the objectives of the study were extracted, fulfilled and organized in the matrix. The logical and explanatory analysis of the entire process was carried out, from preparation to conclusion, supporting it with scientific references, so that, finally, it could be forwarded for dissemination.

To analyze the level of evidence, the framework developed by the Joanna Briggs Institute Levels of Evidence and Grades of Recommendation Working Party October was applied, therefore, the authors made it available in the last column, after the results of the studies24.

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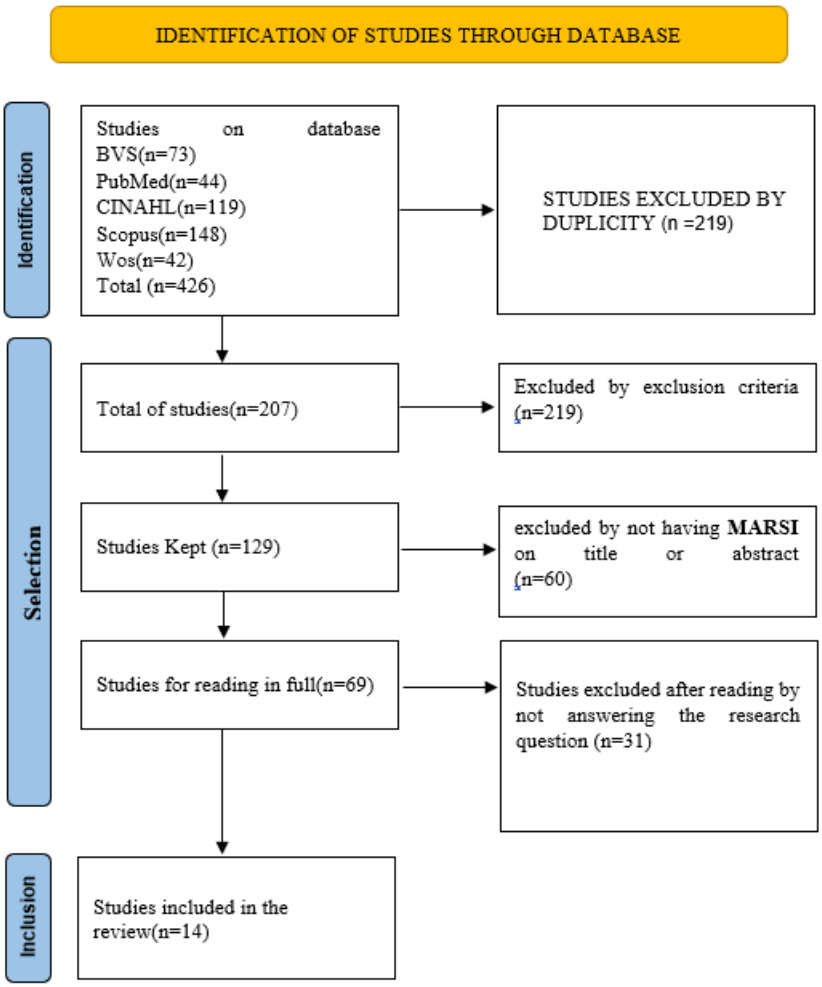
Figure 1 - Flowchart for selection of primary articles included in the sample of this integrative review. Curitiba, PR, Brazil, 2024



Source: Adapted from PRISMA (2020).

RESULTS

The results were organized according to the study theme, including the incidence, prevalence, and care for the prevention of MARSI, presented in Table 2.

In relation to the countries where the studies were developed, China stands out in first place with 5 studies (P2; I3; I4; IC1 and IC2)15,23,17,12,20, followed by Brazil with 3 (P1; C3 and IC1)10,16,12, the United Kingdom with 2 (C1 and C2)13,14. And with 1 study in each of the countries: Korea (I2)22; Australia (C6)21; United States (C5)5 and Russia (C4)19. Regarding the year of publication: 1 study in 2024 (I4)17; 4 studies (28.57%) were in 2023 (P2; I3; C3 and C4)15,23,16,19, 2 studies in 2022 (IC2; C6)20,21, 3 studies in 2021 (C1; IC1 and I2)13,12,22; 3 studies in 2020 (I4, P1 and C5)17,10,5 and 1 in 2019 (C2)14,

Furthermore, regarding the language, all publications were found in English (P2; C1; C2; C4; C5; C6; I1; I2; I3; I4 and I5)15,13,14,19,5,21,18,22,23,17, or in

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Portuguese (P1, C3 and IC1)10,16,12. In the characterization of the publications, a predominance (6; 42.9%) of studies that addressed care for the prevention of MARSI (C1 to C6) was observed13,14,16,19,5,21. Next came the MARSI incidence group (4; 28.6%) (I1 to I4)18,22,23,17; followed by the incidence and care group (2; 14.3%) (IC1 and IC2)12,20 and, finally, the MARSI prevalence group (2; 14.3%) (P1 and P2)10,15.

Regarding the study methods, cohort studies prevailed with 4 (28.57%)12,16,12,23, 4 randomized studies (28.57%)20,19,21,5 2 case reports (14.28%)13,14, 3 cross-sectional studies (21.42%)15,17,22, and 1 observational study (14.28%)10. In the prevalence group, only two studies, one in patients admitted to a cardiology intensive care unit10 and the other studying the prevalence of MARSI in healthcare professionals in China during the COVID-19 pandemic15.

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ID	Author/Year	Method, aproach and sample	Intervention/ Types of stickers	Aim	Main results	Level of evidence
P1[10]	Alcântara et al., 2020	Observational, epidemiological, cross-sectional, quantitative study N=123 people admitted to ICU, age >18 years	• Polyurethane film • Electrode • Adhesive elastic bandage • Microporated tape • Surgical tape • Adhesive tape • Collection equipment	To identify and analyze the point prevalence of skin injury related to medical adhesives in patients admitted to Cardiac Intensive Care Units and the demographic and clinical factors associated with its occurrence.	The study showed that the prevalence of MARSI was 22.7%, epidermal removal was the prevalent subtype, followed by friction injury. The adhesive that caused the most injury was the transparent polyurethane film with 46.9%. The region with the highest incidence was the cervical region with 25.1%.	**2C**
P2[15]	Wei et al., 2023	Cross-sectional survey N=414 Health professionals Age <30 years and 50 years.	• Silicone foam • Hydrocolloid • Acrylate Tape • Adhesive Remover	To identify the prevalence and risk factors of MARSI caused by medical staff in China during the COVID-19 pandemic.	The prevalence of MARSI was 41.9% in professionals who used hydrocolloid, silicone foams and acrylate adhesive tapes, in the period between 4h and 8h. Based on the statistical analysis, it was identified that there was a relationship between the type of dressing, time of use and pain score, as a risk factor for MARSI.	**2C**

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C1[13]	Hitchcock et al., 2021	Case series, N=3 Ages: 28 years; 66 years; 83 years	• Barrier spray • Adhesive remover	Report of three cases of MARSI and indication for prevention and health education.	It is recommended that the skin be assessed before applying the patch. Among the preventive measures for MARSI, a barrier spray has been applied to the skin before applying the patch, and care has been taken during removal, using adhesive removers to avoid pain and maintain skin integrity.	**2A**
C2[14]	Collier, 2019	Case series N= 2 Age: 56 years; 36 years.	• Adhesive remover • Foam with silicone	Maintain the integrity of the skin around the Peripherally Inserted Central Catheter (PICC).	To alleviate pain and improve tissue function in study patients, care for skin assessment, patch removal, and treatment of MARSI.	**2A**
C3 [16]	Frota et al., 2023	Prospective cohort study N=150 individuals N=439 catheters in two general adult ICUs of two public hospitals. Population over 18 years old; with catheters fixed in the skin for more than 48 hours	• Natural rubber • Acrylate • Polyurethane film • Hydrocolloid • Preventive care • Skin hydration • Adhesive removers • Avoid alcohol-based products • Application of the Braden scale	To identify the incidence and risk factors for MARSI in critically ill patients with catheters.	The incidence rate was 42%, and the following were associated with the occurrence of MARSI: advanced age (61.4 years); reduced skin hydration and elasticity, prolonged hospital stay (18.4 days); dry skin, repeated removal of patches, low Braden scale score, and hypoalbuminemia were associated with MARSI.	**2A**

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C4[19]	Gogoleva, Kucher, Bogomolnyi, 2023	Randomized Clinical Trial N=46 adults aged 18 to 66 years. Control group: (n=26) used alcohol-based solution. Intervention group: (n=20) used silicone-based solution	• Adhesive film dressing with 2% chlorhexidine gluconate antiseptic • Adhesive remover • Isopropanol-based solution	To compare the safety and efficacy of a silicone-containing adhesive remover and an isopropanol-based solution in CVC procedures in hematologic patients.	CVC dressings were removed with an isopropanol-based skin antiseptic solution and others with a silicone-based remover spray. Skin irritation at the dressing site was lower (5%) in the control group, and six times higher (30.1%) with the use of a silicone-containing spray. No patient in the study was allergic to the silicone spray.	**2B**
C5[5]	Cole, et al., 2020	Clinical Trial Randomized N=185 Control group: N=92 Treatment group: N=93 Age: 40 to 70 years	• Assessment with the Braden scale • Skin barrier film	To evaluate the efficacy of skin barrier film over standard dressings in preventing MARSI in postoperative spinal surgery patients.	Approximately 15% of participants in the intervention group and 15% of participants in the control group developed postoperative skin injury. The study results do not support the use of barrier film in spine surgery patients.	**2B**

C6[21]	Pearse et al., 2022	Two-arm randomized controlled trial conducted in three hospitals in Australia. N=160 CG=80 standard adhesive dressings according to local hospital policy. IG=80 standard dressings and liquid adhesive.	• Liquid adhesive • Skin barrier	To evaluate the effectiveness of liquid adhesive compared to standard care with respect to adverse events, dressing changes, workload and costs.	Patients were followed from the time of central venous catheter insertion until 48 hours after catheter removal. The primary outcome was 'dressing failure', defined as the need for dressing replacement on the initial central catheter before seven days. The liquid adhesive was applied over the institution's standard dressing.	**1A**
IC1[12]	Pires-Júnior et al., 2021	Prospective cohort Conducted in an ICU in an Oncology Hospital N=100 Age between 26 and 89 years Mixed race	• Skin assessment • Braden Scale • Risk factors	To estimate the incidence of MARSI in the peripheral venous catheter fixation region in critically ill oncology patients, identify risk factors and establish a prediction model for MARSI.	The incidence of MARSI was 31.0%, with a density of 3.4 cases per 100 person-days, ranging from 1.9 to 3.7% cases per 100 patient-days. The mean time to occurrence was 5.60 days. MARSI was identified as skin removal. Associated factors were: alcoholism, smoking, deep vein thrombosis, acute respiratory failure, immediate postoperative period, heart disease, dyslipidemia, use of antiarrhythmics, having received packed red blood cells, presence of pressure injury, skin tear, decreased turgor, edema, hematoma, petechiae, Braden scale risk scores, clinical severity, elasticity, moisture, texture and color of the skin..	**2A**

IC2[20]	Zhao, Bian, Yang, 2022	Case-control N= 156 participants with PICC, CG: 85 participants, conventional nursing care IG: 71 participants, MARSI nursing care management	**Assessment** of skin, color, uniformity, texture, appearance, integrity, moisture and edema. **General assessment** Age, malnutrition, dehydration and chemotherapy treatment. **Risk prevention**: Individualized selection of the appropriate adhesive, use of self-adhesive thin foam; adhesive removers, avoid the use of skin irritating products, clean the skin with saline solution, apply skin protector, dressing with film hypoallergenic dressing. **Risk management:** Education and training of nursing staff. **Skin preparation:** Technique for applying and removing adhesives, barrier products, use of adhesive removers.	To evaluate the effectiveness of intervention in nursing management of skin lesions related to medical adhesives at the peripherally inserted central catheter (PICC) insertion site in cancer patients.	The total incidence of MARSI was approximately 30.59% in the CG and 7.04% in the IG. Mechanical injury in the CG was 12.94%, decreasing to 2.8% in the IG. Dermatitis in the CG was 11.76% and in the IG 2.82%. Maceration in the CG was 5.88% and in the IG 1.41%. Folliculitis in the CG 2.35% and in the IG 0%.	**3B**
I1[18]	Kim, Shin, 2021	Cross-sectional study N= 143 individuals aged 20 years or older, undergoing elective spinal surgery.	Silicone Adhesive Polyurethane Foam Dressing Non-woven Fabric Adhesive	To determine the incidence, types and factors associated with MARSI in spinal surgery patients.	The incidence of MARSI in surgical areas was 36.4%; and the rate per 100 medical adhesives was 9.8%. MARSI lesions occurred on the 1st or 2nd postoperative day, and were: Skin stripping 23.1%; Skin tears 28.8%; Tension injury or blister 13.5%; Contact dermatitis 34.6%.	**2C**

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I2[22]	Yang, et al., 2023	Prospective cohort N=382 individuals aged 18 years or older, undergoing cancer treatment and undergoing PICC placement.	Transparent film dressing	Identify the incidence of MARSI and risk factors.	The overall incidence of MARSI was 15.7%. The most common types of MARSI were mechanical skin damage (7.1%) and contact dermatitis (8.1%). Tension/blister injury was the most common type of mechanical skin damage (4.7%). Contact dermatitis (3.7%) was the most common type of MARSI. MARSI lesions were observed on average 7.2 days after PICC placement. No folliculitis was observed during the study..	**2A**
I3[19]	Gao-Chao et al., 2020	Cross-sectional N=430 individuals over 18 years old, admitted to the intensive care unit.	• Transparent film; ∉ Silk tape; ∉ Mesh tape; ∉ Hydrocolloid; ∉ Foam.	Present epidemiological data on MARSI and emphasize the need to implement preventive measures.	The incidence of different types of MARSI in 57 patients with catheters. The overall incidence of MARSI was 11.86%. MARSI (94.5%) were caused by mechanical injury. Three patients developed dermatitis and two developed irritant contact dermatitis.	**2C**

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I4[17]	Mengying et al., 2024	Prospective observational cohort study N=340 participants with cancer, aged 18 years or older, with CHF.	Transparent film dressing	To explore the incidence and risk factors for MARSI at peripherally inserted catheter (PICC) sites in cancer patients.	The incidence of MARSI was 9.7%, ● Skin injury 24.2%, ∉ Stress injury 15.2% ∉ Irritant contact dermatitis 30.3% ∉ Allergic dermatitis 21.2% ∉ Maceration 9.1%	**2A**

Legend: P - prevalence I - incidence; C- Care IC- incidence and care.

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DISCUSSION

The National Health Surveillance Agency (ANVISA), as the Brazilian regulatory body in the field of health surveillance, has not yet standardized skin lesions related to the use of medical adhesives as an adverse event requiring mandatory reporting, as is the case with pressure injuries[3].

In this scenario, where reporting is not mandatory, there are difficulties in assessing the prevalence of MARSI in hospitals and, consequently, there are few publications on the subject. This article summarizes two studies on the prevalence of MARSI, P1 and P2. However, only P1 is a study of prevalence in patients, while P2 portrays the prevalence of MARSI in health workers outside the Brazilian setting.

Study P1 was carried out in two highly complex teaching hospitals specializing in Cardiology, located in the city of São Paulo, and showed a prevalence of MARSI in an Intensive Care Unit, where it was observed that the prevalence was 22.7%, with the prevalent causative agent being polyurethane film (46.9%) and the most affected region being the cervical region (25.1%), due to the use of film for catheter fixation. The predominant subtypes in the study were epidermal removal (43.8%), friction injury (40.6%), tension injury (12.5%) and irritant dermatitis (3.1%), where the tail can be considered the mechanical trauma due to the removal of the adhesive. We can also consider the severity of the population, since the study was carried out in an intensive care unit10.

This is consistent with the results presented in the aforementioned study, a prospective and descriptive study carried out at a university institution in the United States in 2015, which demonstrated a prevalence of 3.4 to 25.0% of MARSI in patients admitted to non-intensive care units, with an average of 13.0%, and for venous catheter fixation the prevalence was 35.6%6.

The consensus (2020) Overlooked and underestimated: medical adhesive-related skin injuries, encourages the analysis of adverse events in depth, through root cause analysis instruments, which is essential for improving the quality of care and reducing MARSI4.

The other study on the prevalence of MARSI in health workers, P2, carried out in China, interviewed 46 hospitals and 414 members of the care team during the COVID-19 pandemic through questionnaires. The professionals who used dressings on their face and head for prevention were 83.1%, with the prevalence of MARSI being 41.9%. The highest incidence of the event occurred in professionals who used hydrocolloid, and they also reported pain during removal15.

The COVID-19 pandemic has brought up previously unheard-of topics, such as MARSI in workers. In Brazil, the Brazilian Society of Ostomy Therapy launched a Manual on Skin Injuries Related to the Use of Personal Protective Equipment in Health Professionals, to guide and

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inform professionals about the recommendations for protection, use of PPE and self-care measures to prevent skin injuries. In order to prevent medical device-related pressure injuries (MDRIs), health professionals used various types of adhesives as an interface for preventing MDRIs and were affected by MARSI due to the repeated removal of the adhesive, causing skin fragility and increasing the risk of MARSI11.

Despite the different populations, P1 and P2 report a high prevalence of MARSI, whether due to the use of hydrocolloid dressings or film for catheter fixation. In this sense, it is important to emphasize that the choice of adhesive, frequent removal of the adhesive from the skin, increases the risk of MARSI, and the lack of preventive care4.

Regarding the incidence of MARSI, article I1, using a cross-sectional method conducted in Korea, analyzed a sample of 143 patients. The results demonstrated an incidence of contact dermatitis in 34.6%, followed by Skin Tear in 28.8% of postoperative spinal surgery patients, with onset observed up to the second postoperative day18.

Studies I2 and I3, which addressed cancer patients, reported the occurrence of MARSI at the PICC fixation site. Cohort study I2, with a population of 382 patients, identified contact dermatitis in 8.1% of cases, followed by mechanical injury in 7.1%22. Cross-sectional study I3, with a population of 430 patients, presented an incidence rate of 11.86%. This study highlighted mechanical injury in 94.55% of cases, followed by skin stripping in 72.73% and skin Tear in 14.55%19. The researchers attributed these results to the fragility of the skin of the study population and the use of medications such as immunosuppressants and anticoagulants, considered independent risk factors for MARSI5.

These results highlight the fragility of the skin of the study population and the impact of the use of medications such as immunosuppressants and anticoagulants, considered risk factors for MARSI4. Finally, the I4 cohort study, with a population of 340 cancer patients using PICC, reported an incidence of 9.7% of MARSI. The main types of occurrence were contact dermatitis (30.3%), skin lesion (24.2%), allergic dermatitis (21.2%) and tension injury (15.2%)17.

The risk factors for MARSI, cited in the incidence articles, are mentioned in the consensus, which demonstrates that it is sine qua non to evaluate risk factors, such as immunosuppression, infection, diabetes, renal failure and chronic venous insufficiency, and that it is also necessary to pay attention to the choice of adhesives to be used in this population that is more prone to damage4.

Regarding care, the IC1 study, a prospective cohort study with 338 oncology patients using peripheral venous catheters, demonstrated an incidence of 31.0%, with the medical diagnosis for the occurrence of MARSI being 5.6 days, identified as skin removal. The associated risk factors were alcoholism, smoking, deep vein

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thrombosis, acute respiratory failure, immediate postoperative period, heart disease, dyslipidemia, use of antiarrhythmic drugs, blood transfusion, presence of pressure injury, friction injury, decreased turgor, edema, hematoma, petechiae, Braden scale with risk, clinical severity, skin elasticity, moisture and discoloration12.

The importance of assessing the skin and the patient's risk factors, in addition to applying the Braden scale and other predictive risk scales, are part of the best practices for preventing MARSI5,16.

According to Table 2, cited above, six studies were found that discussed skin care for preventing MARSI, with C3 and C5 highlighting the importance of applying the Braden scale for skin assessment.

Also in the Incidence/Care group, a case-control study conducted in China with a sample of 156 IC2 patients demonstrated an incidence of 30.59% in the control group and 7.04% in the intervention group, and mechanical injury was identified in the control group with 12.94%, decreasing to 2.82 in the intervention group. Skin was assessed for color, uniformity, texture, appearance, integrity, age, moist skin, edema, malnutrition, dehydration, and chemotherapy treatment. Regarding risk prevention, individualized selection of adhesives, removers, application of skin protectors, use of transparent film and use of hypoallergenic dressings were highlighted. The authors recommend training the team, skin preparation, application and removal techniques for adhesives, use of barrier products and removers20.

As for the care found in this study and listed in Table 2, they are in line with the consensus (2020), Overlooked and underestimated: medical adhesive-related skin injuries, which recommends assessing the skin for turgor, integrity, performing a risk assessment, checking the skin microclimate, and assessing risk factors such as immunosuppression and chronic venous insufficiency4.

The aforementioned consensus regarding training on the prevention of MARSI injuries suggests that it should be broadly provided and made available to all healthcare professionals4.

Care regarding the application of barrier film as prevention was mentioned in C1, which provided guidance on care for the periwound skin in pressure injuries in the sacral region, also on the periwound skin before applying transparent film for negative pressure therapy and sacral region at risk for incontinence-associated dermatitis13. Similarly, C5, in its study with post-operative spinal patients, applied barrier film before applying the adhesive in its intervention group5. Study C6, on the other hand, used liquid adhesive to fix a central catheter in the cervical region, and applied barrier film to protect the skin22.

These recommendations are in line with the 2020 consensus, which emphasizes the importance of applying skin barriers to create a protective interface between the skin and the

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adhesive, thus reducing trauma during removal and relieving pain, preventing MARSI4.

Regarding adhesive removers, in studies C1, C2, C3 and C4 this practice was applied, in accordance with the consensus that recommends its use to loosen the adhesive bond and relieve pain13,14,16,19.

We did not find in the studies a description of the technique for applying and removing adhesives; there is only a mention of the need to use these techniques. The studies summarized did not encourage teaching and involving the patient and companion in the care provided by the use of adhesives.

FINAL CONSIDERATIONS

Studies report that skin lesions are commonly found in high-risk patients, in intensive care units, and in the elderly. However, their incidence can be reduced with individualized care, choosing the appropriate product, and providing training to the care team, raising awareness among all, including the patient and family. Skin lesions related to medical adhesives are mostly preventable when preventive measures are implemented and the team is trained.

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Declaration of conflict of interest

Nothing to declare.

Authorship criteria (authors' contributions)

Adrieli Aparecida Simões de Oliveira, 1. contributed substantially to the conception and/or planning of the study; 2. to obtaining, analyzing and/or interpreting the data.

Márcia Helena de Souza Freire, 1. contributed substantially to the conception and/or planning of the study; 2. to obtaining, analyzing and/or interpreting the data; 3. as well as to the writing and/or critical review and final approval of the published version.

Paula e Souza Silva Freitas, 1. contributed substantially to the conception and/or planning of the study; 2. to obtaining, analyzing and/or interpreting the data; 3. as well as to the writing and/or critical review and final approval of the published version.

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