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Stomal therapist nurses role in necrotizing fasciitis and Fournier's syndrome

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ABSTRACT

Objective: To understand the role of the stomal therapist nurses in necrotizing fasciitis through the analysis of scientific articles. **Method:** This is a integrative review that addressed the question: What are the scientific evidences regarding the role of the nurse enterostomal therapist in Fournier's syndrome and necrotizing fasciitis? The descriptors were selected from the Medical Subject Headings Section (MeSH), Health Sciences Descriptors (DeCS), and CINAHL Subject Headings. A bibliographic search of scientific articles was conducted in EMBASE, Medline via PubMed, Scopus, Science Direct/Elsevier, and CINAHL-EBSCO, consulted up to May 2023. **Results:** Thirty-three studies were included, and the main interventions identified in the studies were categorized into six categories, namely: 1) Wound care; 2) Treatment; 3) Warning signs; 4) Patient care; 5) Adjunct therapies; and 6) Nursing team's work process. **Conclusion:** It was possible to identify the main interventions of the stomal therapist nurses and their importance in assisting people with necrotizing fasciitis, as their interventions range from direct wound care to comprehensive patient care, as well as establishing an interprofessional work process.

DESCRIPTORS: Nurses. Nursing care. Enterostomal therapy. Fournier Gangrene. Fasciitis, necrotizing.

Atuação de enfermeiros estomaterapeutas na fasciíte necrosante e na síndrome de Fournier

RESUMO

Objetivo: Conhecer a atuação do enfermeiro estomaterapeuta na fasciíte necrosante, por meio da análise de artigos científicos. **Método:** Trata-se de revisão integrativa, que respondeu à questão: Quais são as evidências científicas sobre a atuação do enfermeiro estomaterapeuta na síndrome de Fournier e fasciíte necrosante? Os descritores foram selecionados da *Medical Subject Headings Section*, Descritores em Ciências da Saúde e *Cumulative Index to Nursing and Allied Health Literature Subject Headings*. Realizou-se levantamento bibliográfico de artigos científicos na *Excerpta Medica Database, Medical Literature Analysis and Retrieval System Online, Scopus, Science Direct e Cumulative Index to Nursing and Allied Health Literature*, consultadas até maio de 2023. **Resultados:** Foram incluídos 33 estudos, e as principais intervenções identificadas nos estudos foram assim categorizadas:

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1) Cuidados com a lesão; 2) Tratamento; 3) Sinais de alerta; 4) Atenção à pessoa; 5) Terapias adjuvantes e; 6) Processo de trabalho do enfermeiro e da equipe de enfermagem. **Conclusão:** Foi possível identificar as principais intervenções do enfermeiro estomaterapeuta e sua importância na assistência de pessoas com fasciíte necrosante, pois suas intervenções abrangem desde cuidados diretos com a lesão até a atenção integral à pessoa, bem como o estabelecimento de um processo de trabalho interprofissional.

DESCRITORES: Enfermeiras e enfermeiros. Cuidados de enfermagem. Estomaterapia. Gangrena de Fournier. Fasciíte necrosante.

Actuación de los enfermeros estomaterapeutas en la fascitis necrosante y en el síndrome de Fournier

RESUMEN

Objetivo: Conocer la actuación del enfermero estomaterapeuta en la fascitis necrosante, mediante el análisis de artículos científicos. **Método:** Se trata de una revisión integrativa que respondió a la pregunta:¿Cuáles son las evidencias científicas sobre la actuación del enfermero estomaterapeuta en el síndrome de Fournier y la fascitis necrosante? Los descriptores fueron seleccionados a partir del *Medical Subject Headings Section* (MeSH), Descriptores en Ciencias de la Salud (DeCS) *y Cumulative Index to Nursing and Allied Health Literature Subject Headings*. Se realizó un levantamiento bibliográfico de artículos científicos en *Excerpta Medica Database, Medical Literature Analysis and Retrieval System Online, Scopus, Science Direct y Cumulative Index to Nursing and Allied Health Literature*, consultados hasta mayo de 2023. **Resultados:** Se incluyeron 33 estudios, y las principales intervenciones identificadas fueron categorizadas en seis categorías, a saber: 1) Cuidados de la lesión; 2) Tratamiento; 3) Signos de alerta; 4) Atención a la persona; 5) Terapias adyuvantes; y 6) Proceso de trabajo del enfermero y del equipo de enfermería. **Conclusión:** Fue posible identificar las principales intervenciones del enfermero estomaterapeuta y su importancia en la atención a personas con fascitis necrosante, ya que sus intervenciones abarcan desde los cuidados directos de la lesión hasta la atención integral a la persona, así como el establecimiento de un proceso de trabajo interprofesional.

DESCRIPTORES: Enfermeras y enfermeros. Atención de enfermería. Estomaterapia. Gangrena de Fournier. Fascitis necrotizante.

INTRODUCTION

Fasciitis refers to inflammatory conditions that affect the fascia, a connective tissue structure that surrounds muscles, organs, and other bodily structures. Among the different types of fasciitis, necrotizing fasciitis stands out (NF)[3].

In 1883, the infectious disease physician Jean Alfred Fournier described necrotizing fasciitis (NF) in the genital and perineal regions, referring to it as Fournier's syndrome. Later, in 1952, physician Wilson Ben proposed the term necrotizing fasciitis, characterizing fascial necrosis as the key feature of the disease, not limited to urogenital tract tissues. He described NF as a necrotizing soft tissue infection marked by its rapid and destructive progression, leading to necrosis of the skin, subcutaneous tissues, fascia, muscle planes, and nerves in any part of the body[4-8].

Therefore, Fournier's syndrome is a type of necrotizing fasciitis, and these conditions are caused by the invasion of various bacterial microorganisms, both aerobic and anaerobic. The entry of these microorganisms into the body can occur through different routes, including the urogenital and gastrointestinal tracts, urinary tract infections, invasive medical procedures, or traumatic injurie[4,5].

Most patients present with a polymicrobial infection, typically involving an average of 4.4 distinct types of microorganisms, with the most common being group A beta-hemolytic Streptococcu [9].

Necrotizing fasciitis can be difficult to diagnose in its early stages, as it may resemble cellulitis with initially intact skin. However, signs such as redness, erythema, and disproportionate pain may be present. As the infection spreads, blisters increase in number and size, the skin takes on a grayish-blue hue, and becomes hardened. Later, patients may develop sepsis, characterized by high fever, elevated white blood cell count, shock, and multiple organ failure. In advanced stages, the patient may become disoriented or unconscious[10,11].

NF has a high mortality rate, estimated at 32.2%, and can reach 100% without appropriate treatment[3,7,8]. In recent years, mortality rates have declined due to advances in disease management. However, it is crucial to initiate treatment as early as possible, as any delay can significantly increase the risk of death[12].

The primary treatment currently involves the use of broad-spectrum systemic antibiotics and aggressive surgical debridement [13,14]. Patients at higher risk of developing necrotizing fasciitis include the elderly and neonates, as well as individuals who are obese, malnourished, immunocompromised, diabetic, or have vascular disorders. Occurrence in otherwise healthy individuals is typically associated with a history of minor trauma[11,14]. Healthcare professionals play a fundamental role in the care of patients with necrotizing fasciitis, as it is a severe condition that requires an interdisciplinary approach for proper treatment and management. Treatment includes surgical interventions to remove necrotic tissue, intensive clinical support, and, critically, appropriate wound care[15,16].

In this context, the stomal therapy nurse plays a crucial role by providing systematic assessment and specialized interventions throughout the entire therapeutic process. Their comprehensive and individualized care contributes to improved wound healing, reduced complications, and, consequently, better clinical outcomes and quality of life for patients with necrotizing fasciitis[17].

OBJECTIVES

To understand the role of the stomal therapy nurse in necrotizing fasciitis through the analysis of scientific articles.

METHODS

This is an integrative review that followed the steps below:

1. Formulation of the research question, which defined the descriptors and search strategy in the databases;
2. Definition of inclusion and exclusion criteria for the studies;
3. Categorization;
4. Evaluation of the included studies;
5. Interpretation of the results; and
6. Knowledge synthesis[18].

The research question was developed based on the PICo strategy, in which 'P' referred to the participants (stomal therapy nurses), 'I' to the phenomenon of interest (Fournier's gangrene and NF), and 'Co' to the context of the study (professional practice)[19], being: What are the scientific evidences regarding the role of the stomal therapy nurse in Fournier's syndrome and NF?

The descriptors were selected from the Medical Subject Headings (MeSH), Health Sciences Descriptors (DeCS), and the Cumulative Index to Nursing and Allied Health Literature (CINAHL), via EBSCOhost (CINAHL-EBSCO) Subject Headings. The following search terms were used in the Medical Literature Analysis and Retrieval System Online (Medline), via PubMed: nurses; nurse's role; nursing care; Fournier gangrene; and fasciitis, necrotizing, as well as enterostomal therapy and enterostomal. It is worth noting that the strategy was adapted for other databases, and evidence was also sought in articles involving generalist nurses due to the limited number of publications specifically addressing stomal therapy, in order to avoid overly restricting the search strategy.

A bibliographic search of scientific articles was conducted in the following databases: Excerpta Medica Database (EMBASE), Medline via PubMed, Scopus (Elsevier's multidisciplinary database), ScienceDirect (Elsevier platform), and CINAHL-EBSCO, using different search strategies (Table 1), considering that each database has distinct characteristics (Table 2)[10,11,13,14,20-48]

The eligibility criteria included full-text scientific articles published in Portuguese, English, or Spanish, with no restrictions regarding the year of publication. Duplicate articles and those not directly addressing the proposed topic were excluded. Data collection was carried out in May 2023.

Two researchers independently conducted the study search, ensuring rigor and reliability. Article selection followed this sequence: reading of the title and abstract, followed by full-text review. Any disagreements were discussed by the reviewers to reach a consensus, and a third reviewer was consulted when necessary.

For data extraction, a form specifically developed for this study was used. This pre-established form included the following information: study identification (author, reference, country, journal, area/setting, title), design/method/level of evidence, objective, and main findings.

For the level of evidence, the classification considered was:

Level I – Systematic review or meta-analysis

Level II – Well-designed randomized controlled clinical trial

Level III – Well-designed clinical trials without randomization

Level IV – Well-designed cohort and case-control studies

Level V – Systematic review of descriptive and qualitative studies

Level VI – Descriptive or qualitative study

Level VII – Expert opinion and/or reports from expert committee[49].

RESULTS

A total of 412 articles were identified, with 304 excluded based on title and abstract, and 56 due to duplication. Of the 52 studies selected, 12 were excluded for not meeting the inclusion criteria and 7 did not address the nurse's role. In this review, 33 studies were included for results synthesis.

A flowchart illustrating the search and selection process, along with the distribution of the articles according to the inclusion and exclusion criteria, is presented in Figure 1, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)[50].

Table 1. Search strategies applied by database. São Paulo (SP), Brazil, 2023.

Database	Search strategy
EMBASE	('nurse'/exp OR nurse OR 'enterostomal therapy nursing'/exp OR 'enterostomal therapy nursing') AND ('necrotizing fasciitis'/exp OR 'necrotizing fasciitis' OR 'fournier gangrene'/exp OR 'fournier gangrene')
Medline/PubMed	("fasciitis, necrotizing"[MeSH Terms] OR "fasciitis necrotizing"[All Fields] OR "Fournier Gangrene"[MeSH Terms] OR "Fournier Gangrene"[All Fields]) AND ("Nurses"[MeSH Terms] OR "Nurses"[All Fields] OR "Nurse's Role"[MeSH Terms] OR "Nurse's Role"[All Fields] OR "Nursing Care"[MeSH Terms] OR "Nursing Care"[All Fields] OR ("Enterostomal Therapy"[All Fields] OR "Enterostomal"[All Fields]))
Scopus	(((TITLE-ABS-KEY ("Nurses") OR TITLE-ABS-KEY ("Nurse's Role") OR TITLE-ABS-KEY ("Nursing Care"))) OR ((KEY ("Nurses") OR KEY ("Nurse's Role") OR KEY ("Nursing Care"))) OR ((TITLE-ABS-KEY ("Enterostomal Therapy") OR TITLE-ABS-KEY ("Enterostomal")))) AND (((TITLE-ABS-KEY ("Fasciitis, Necrotizing") OR KEY ("Fasciitis, Necrotizing"))) OR ((TITLE-ABS-KEY ("fournier gangrene") OR KEY ("fournier gangrene"))))
Web of Science	("Nurses" OR "Nurse's Role" OR "Nursing Care" OR "Enterostomal Therapy" OR "Enterostomal") AND ("Fournier Gangrene" OR "Fasciitis, Necrotizing")
CINAHL	("Nurses" OR "nursing role" OR "nursing care" OR "Enterostomal Therapy Nursing") AND ("fourniers gangrene" OR "fasciitis, necrotizing")

Source: Prepared by the authors.

Table 2. Summary of the characteristics of the included studies. São Paulo (SP), Brazil, 2023.

Reference	Title	Method/Level of evidence	Objective
Skacel e Boyle[38]	A five year review of anaerobic, necrotizing soft tissue infections: a nursing perspective	Retrospective cohort study/IV	This article presented a description of the classification, etiology, pathophysiology, and treatment of necrotizing soft tissue infection, followed by a review of the intensive care unit's experience regarding the nursing care needs of this patient group.
Gillen[21]	Necrotizing fasciitis: early recognition and aggressive treatment remain important	Review/V	To review the causes and treatment of cellulitis complicated by necrotizing fasciitis.
Foster et al.[40]	The use of a hydrofibre dressing in fulminating necrotizing fasciitis	Case study/VI	Case study of Fournier's gangrene using hydrofiber dressing (Aquacel) during the intraoperative period and subsequently continued postoperatively.
Bashford et al.[34]	Necrotizing fasciitis: a model nursing care plan	Case study/VI	To assist nurses in assessing and addressing the numerous problems commonly faced by patients with necrotizing fasciitis.
Fink e DeLuca[14]	Necrotizing fasciitis: pathophysiology and treatment	Descriptive/VI	To describe the signs and symptoms, pathophysiology, and diagnosis of necrotizing fasciitis. To discuss key elements of a comprehensive nursing care plan for the treatment of patients with necrotizing fasciitis.
Gully[46]	Nursing management of necrotising fasciitis	Review/V	To provide an overview of the symptoms, treatment, and nursing care for patients with necrotizing fasciitis. Psychosocial considerations, public perceptions, patient consent, and advocacy are also discussed.
Timmons[10]	Necrotizing fasciitis in primary care: presentation, risk factors and treatment	Review/V	To conduct a clinical review on necrotizing fasciitis in primary care: presentation, risk factors, and treatment.
Fritzsche[11]	Soft-tissue infection: necrotizing fasciitis	Descriptive/VI	To increase knowledge and understanding of necrotizing fasciitis and to discuss the role of nurses in minimizing adverse outcomes.
Purnell et al.[24]	A new weapon against severe sepsis related to necrotizing fasciitis	Case study/VI	To review a case of necrotizing fasciitis progressing to severe sepsis in a healthy 19-year-old male.
Gwyn[47]	A divine encounter	Case study/VI	To report a real-life experience of providing vital spiritual care to a man dying from necrotizing fasciitis.
Schroeder e Steinke[25]	Necrotizing fasciitis--the importance of early diagnosis and debridement.	Case study/VI	To describe the pathophysiological mechanisms, clinical manifestations, and treatment of necrotizing fasciitis, as well as the implications for perioperative nursing
Ferreira et al.[26]	Complex wounds	Review/V	To bring awareness of complex wounds to the healthcare community, suggesting that they should be managed by multidisciplinary teams in specialized hospital center
Ruth-Sahd e Gonzales[28]	Multiple dimensions of caring for a patient with acute necrotizing fasciitis	Case study/VI	To report the care of a patient with necrotizing fasciitis and the need for a multidisciplinary approach
Cano e Wigoda[32]	State-of-the-art adjuncts in the treatment of necrotizing fasciitis improves survivability and cosmesis	Case study/VI	To evaluate the use of advanced adjuncts in patient acceptance and physical outcomes
Magel[23]	The nurse's role in managing necrotizing fasciitis	Case study/VI	To report the nurse's role in the treatment of necrotizing fasciitis
Niehuser[44]	Negative pressure therapy dressing application in a patient with Fournier's gangrene	Case study/VI	To demonstrate how negative pressure wound therapy facilitated granulation tissue formation
Astorino et al.[22]	Necrotizing FASCIITIS: EARLY DETECTION MAY SAVE YOUR PATIENT'S LIMB	Case study/VI	To discuss the pathophysiology, early disease detection, diagnostic and treatment challenges, and appropriate nursing interventions related to improving care for patients with necrotizing fasciiti.
Moorman[45]	Surviving life-threatening illness: keys to optimal nursing care	Descriptive/VI	To examine the experience of a mother with necrotizing fasciitis, the application of the Neuman Systems Model (NSM) to address her healing needs, and nursing practice guided by personal worldview

Continue...

Table 2. Continuation.

Reference	Title	Method/Level of evidence	Objective
Vallejo et al.[13]	Utilización de un sistema de derivación fecal en una paciente que desarrolla una fascitis necrotizante de la zona génito-perineal en una unidad de traumatologia	Case study/VI	To present the case of a patient with necrotizing fasciitis and the use of fecal diversion systems
Pour[42]	Use of negative pressure wound therapy with silver base dressing for necrotizing fasciitis	Case study/VI	To discuss negative pressure wound therapy and antimicrobial dressings in the management of Fournier's gangrene
Jones e El-Zawahry[30]	Curative treatment without surgical reconstruction after perineal debridement of Fournier's gangrene	Case study/VI	To present three clinical cases of male patients with Fournier's gangrene, using negative pressure wound therapy after surgical debridement.
Mondragón-Gómez e Jiménez-Utrilla[36]	Proceso de atención de Enfermería a pacientes con gangrena de Fournier	Case study/VI	To identify the affected human needs of patients with Fournier's gangrene through the assessment of functional health patterns and to improve the quality of care using the North American Nursing Diagnosis Association, Nursing Interventions Classification, and Nursing Outcomes Classification taxonomies."
Santos et al.[35]	Assistência de enfermagem a puérpera com fasceíte necrotizante: relato de experiência	Experience report/VI	To report the experience of nursing care provided to a postpartum woman.
Fodel e Smith[27]	Necrotizing soft tissue infections: a review of diagnosis, management, and implications for NP practice	Descriptive/VI	To highlight the symptoms of skin and soft tissue infections, their differences, and severity
Mota et al.[48]	Atuação do enfermeiro na prevenção da gangrena de Fournier: atenção à saúde do homem	Review/V	To describe and analyze the importance of the nurse's role in the prevention of Fournier's gangrene, with an emphasis on men's health.
Durham[39]	Necrotising fasciitis--the importance of both evidence-based nursing care and reflective practice	Case study/VI	To report reflective practice aimed at achieving continuous positive outcomes for all patients and caregivers.
Harrington et al.[20]	A practitioner's guide to necrotizing fasciitis	Case study/VI	To discuss necrotizing fasciitis by addressing disease cost, risk factors, categories/pathology, differential diagnosis, and clinical management.
Özşaker et al.[33]	The care of a patient with Fournier's gangrene	Case study/VI	To present nursing interventions for an elderly male patient referred to the urology department with a diagnosis of Fournier's gangrene.
Cruz et al.[41]	Produção científica sobre gangrena de Fournier e os cuidados de enfermagem: revisão integrativa	Review/V	To describe the characteristics of scientific health literature on Fournier's gangrene, with an emphasis on nursing care."
Meekul et al.[43]	A randomized controlled trial on the outcome in comparing an alginate silver dressing with a conventional treatment of a necrotizing fasciitis wound	Randomized controlled trial/II	To investigate the outcome of comparing silver alginate dressing with conventional treatment for necrotizing fasciitis wounds
Symonds[37]	The community nurse's role in early identification of necrotising fasciitis: raising awareness	Case study/VI	To raise awareness, especially among primary care professionals and the community, as they are often the first point of contact with patients in the early stages of necrotizing fasciitis.
Guevel e Shifrin[29]	Necrotizing fasciitis in the adult patient: implications for nurse practitioners	Review/V	To reduce morbidity and mortality rates, costs, and hospital stay duration for patients with necrotizing fasciitis through early diagnosis, awareness of risk factors, recognition of signs and symptoms, and appropriate treatment.
Alves et al.[31]	Gangrena de Fournier: conhecimento de enfermeiros sobre a doença e suas experiências no cuidado aos pacientes	Quantitative cross-sectional study /VI	To analyze the knowledge of nurses from a teaching hospital regarding Fournier's gangrene and their experiences in caring for patients affected by the disease.

Source: Prepared by the authors.

The selected studies were published between 1995 and 2022; only three (9.09%) were more recent publications (2018 to 2022). Nineteen articles (57.57%) were published before 2004, eleven (33.33%) between 2013 and 2017, and three (9.09%) between 2018 and 2020. The vast majority of the studies were published in English (27; 81.81%), followed by Portuguese (4; 12.12%) and Spanish (2; 6.06%).

The studies were analyzed according to their level of evidence. It was observed that only one study had level II evidence, one had level IV, and seven were classified as level V. The remaining studies were classified as level VI. Table 2 summarizes the descriptive characteristics of the studies included in this integrative review.

The main interventions identified in the studies that may be performed by stomal therapy nurses were categorized into:

1. Treatment
2. Wound care
3. Warning signs
4. Patient-centered care
5. Adjunct therapies
6. Work processes of the nurse and the nursing team (Table 3)[10,11,13,14,22-41,44-46,48-52].

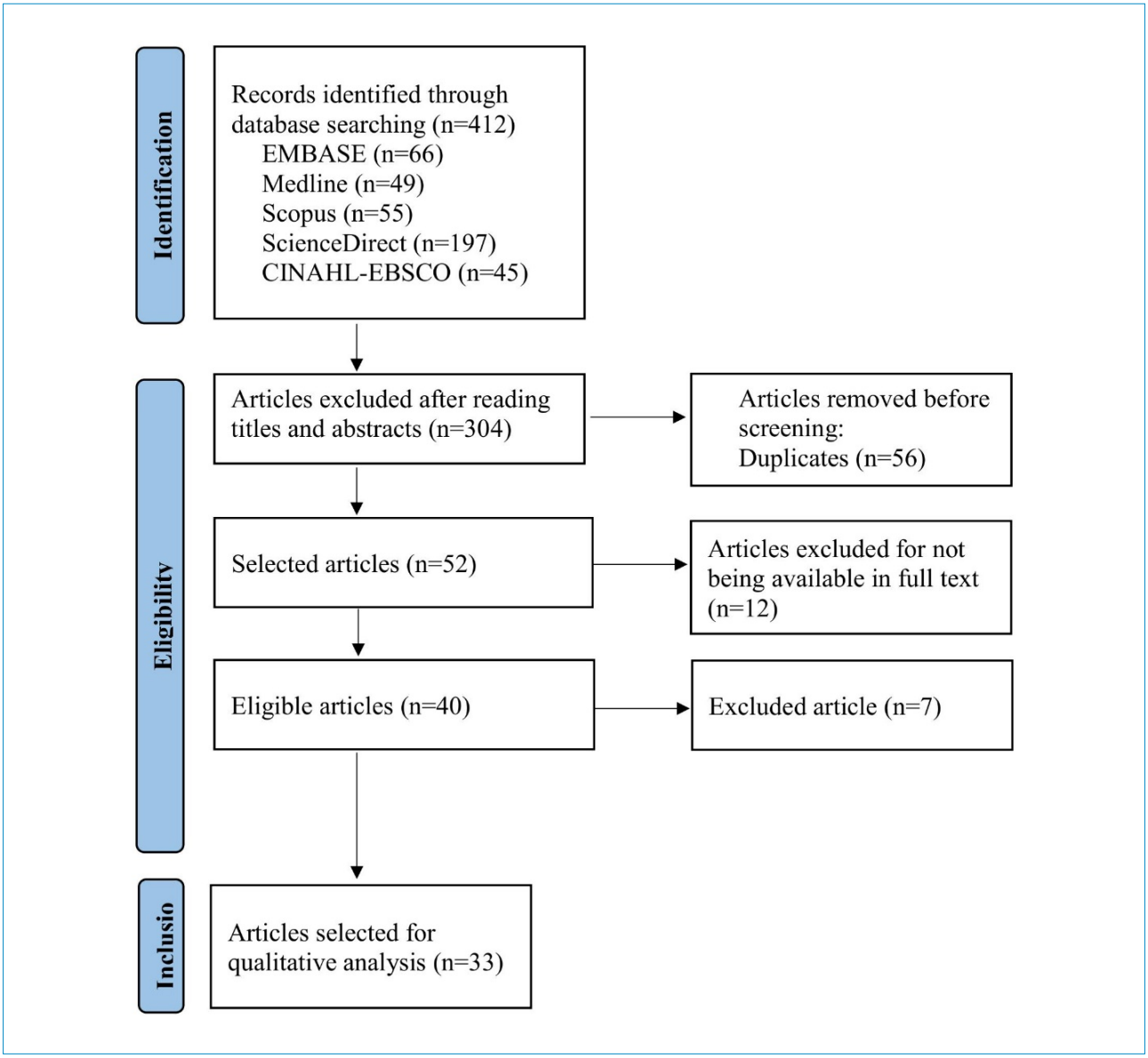

Figure 1. Flowchart of the article selection process. São Paulo, Brazil, 2023[50].

Table 3. Synthesis of the content of the articles from the integrative review. São Paulo (SP), Brazil, 2023.

Category	Nursing Interventions
1. Treatment	Early diagnosis[10,11,13,14,22-31,35,38,39,44,51]
	Surgical intervention[10,11,13,14,22-32,34,35,38-40,44,51]
	Antibiotic administration[11,13,14,22-24,26-31,33,35,36,38-40,44,51]
	Hemodynamic and metabolic stabilization[26,29,38,39,44,51]
	Skin graft care[11,14,22,23,28,30,32]
	Multidisciplinary team[11,22,27,28,36-38,41,51]
2. Wound care	Wound-focused care[10,11,13,14,23-25,27,30,31,33,36,37,40,41,44-46,49,51]
	Use of appropriate dressings[11,13,14,30,33,40,44-46,49]
3. Warning signs	Monitoring and risk factors[10,14,22,24,26,27,30,31,33,36-39,44,51]
	Recognition of signs and symptoms[10,11,14,22-27,29-33,35-39,44,45,48,51]
	Diagnostic tests[10,14,22,24,26,30,31,35,36,38,39,44,51]
4. Patient-centered care	Nutritional support[10,11,13,14,23,24,26,27,30,36-41,44,49,51]
	Psychological support[10,11,14,24,25,27,30,35-37,40,44,51]
	Pain management[10,13,14,24-27,30,36,39,40,45,51]
	Holistic approach[14,38,44,50,51]
	Self-care assessment[10,14,36]
	Hydration[13,14,38,51]
	Immunization[36]
	Sleep/rest assessment[36]
	Spiritual care[50,52]
	Bowel function[36]
5. Adjunct therapies	Hyperbaric oxygen therapy[10,11,23,24,26,30,33,36,40,49]
	Negative pressure wound therapy[22,24,28,32-34,41,45,49]
6. Work processes of the nurse and the nursing team	Nursing care systematization[37,44]
	Nursing process[22,27,29,31,35-39,44]
	Maintain large-bore venous access[11,24,30,36,44,51]
	Vital signs monitoring[10,14,40,44,51]
	Health education[11,14,24,30,36,37,44,48]
	Nurse continuing education[33,37,48]

Source: Prepared by the authors.

DISCUSSION

Category 1 — Treatment

Early diagnosis of NF is challenging in its initial stage due to its resemblance to other conditions such as erysipelas, cellulitis, and osteomyelitis, and it can rapidly progress to a life-threatening disease.[20,21]. The progression of necrotizing fasciitis can be extremely fast, with tissue destruction occurring at a rate of up to one inch (2.54 cm) per hour, posing a serious risk to life within a short period. The mortality rate ranges from 70 to 80% when treated with antibiotics alone, but decreases to 30 to 40% with immediate recognition and prompt surgical intervention.[11,20-24].

Patients with suspected necrotizing fasciitis should undergo early and aggressive surgical debridement within 12 hours of initial presentation, accompanied by a multidisciplinary team, as any delay may increase morbidity and mortality in these patient[21-23,25-29]. After surgical debridement, the wound edges should be left open and filled with dressings and drain s[29]. Additional procedures, such as temporary urostomy and/or colostomy[14,30], may also be performed, especially when necrotizing fasciitis affects the perineal and vulvar regions[13,31,32]. Although some surgical techniques preserve portions of viable

skin, most patients require reconstructive surgery and grafting after complete eradication of the infection[21,28]. Skin grafts and flaps are viable options; however, in cases of significant soft tissue loss, the use of skin and dermal substitutes may be considered, such as dermal regeneration matrices, which provide protection against bacterial infection and help reduce fluid, protein, and electrolyte loss[11].

The rapid intravenous administration of broad-spectrum antibiotics should be initiated immediately upon diagnosis of NF to prevent rapid progression and ensure adequate coverage of aerobic gram-positive, gram-negative, anaerobic bacteria, and fungis[14,24-29,31,33,34]. Once wound cultures are analyzed, antibiotics may be adjusted according to the susceptibility of the identified microorganisms[21,22,24,27].

Integration and collaboration among all team members are especially critical in complex cases such as necrotizing fasciitis, where multiple factors can influence the prognosis[20,26,34-36]. Nurses play a vital role in ensuring the immediate availability of resources for emergency surgical debridement, which should be performed every six hours during the first 48 hours until necrosis is under control. After that, daily debridements may be required[14,22,25,28,31,37,38].

Category 2 – Wound care

Wound care involves prevention, assessment, treatment, and follow-up, especially when the wound is complex and has undergone surgical debridement[10,21]. The progression of the healing process should be closely monitored, and events that may interfere with wound recovery must be evaluated. Comprehensive data collection and physical examination are essential to identify determining or contributing factors to favorable or unfavorable wound healing outcomes[10,35].

The use of the TIMERS mnemonic is relevant for the assessment, treatment, and follow-up of woundss[10]. In this model, 'T' refers to the tissue present in the wound bed; 'I' to signs of infection or inflammation; 'M' to moisture imbalance; 'E' to the epithelial edge; 'R' to repair and regeneration; and 'S' to social factors affecting wound healing. This tool aims to guide wound care and highlight the main barriers that hinder the healing process, ensuring thorough assessment and enabling the implementation of appropriate interventions to promote wound healing[39,53].

At each dressing change, it is important to assess and document the characteristics of the wound and the periwound tissue [14,34]. Authorization should be obtained to photograph the sequence of dressings, creating a photographic record [39] to assist in identifying the progression of healing [11,23,34,38].

Dressings for open surgical wounds should be applied using sterile technique[28,40] o reduce the risk of infection in patients during treatment[14], in addition to proper handwashing before and after dressing changes to prevent the introduction of bacteria into exposed tissue, a private room with contact isolation is also important[29,34].

These procedures are generally complex and require the collaboration of multiple personnel to position the patient and perform the dressings [38]. he choice of dressing is fundamental to wound healing, patient comfort, and rehabilitation[40]. It is essential for nurses to be familiar with the products available on the market in order to select the most appropriate dressing. They must also have knowledge of the healing process and its influencing factors, acquired through technical and scientific training[40-42].

The ideal dressing for treating such wounds should include antimicrobial therapy to reduce odor and protect the surrounding skin. The use of silver's antimicrobial mechanisms is the best choice for managing necrotizing fasciitis, as it ensures a clean environment and adequately prepares the wound bed[20,43].

The use of hydrofiber dressings with silver, both during and after surgery, maintains a moist wound environment and controls exudate, preventing infections and promoting proper healing of the exposed tissue. The antimicrobial efficacy is immediate upon application and lasts for up to seven days[13,40,54]. The use of silver sulfadiazine is also effective, but it requires frequent dressing changes, which may cause patient discomfort and increase costs[14,28,51]. Calcium alginate with silver is an effective and affordable alternative, especially in situations involving bleeding or maceration of the wound edges [28,43]. Wound cleansing with saline solution followed by the application of dressings is essential to prevent infections and promote proper healing of the exposed tissue [13,28,38]. Although not widely discussed in the literature, the use of PHMB-based solutions may help reduce bacterial colonization.

Category 3 — Warning signs

Nurses play a crucial role in the early identification of signs and symptoms of NAto prevent misdiagnosis and initiate treatment as quickly as possible, given the rapid progression of the disease. Early symptoms include pain at the wound site, fever, body aches, dizziness, malaise, erythema, nausea, diarrhea, and extreme thirst. In more advanced stages, between two and four days, symptoms may include lesions, edema, blisters, ischemia, necrosis, dehydration, infrequent urination, hypotension, tachycardia, dizziness, and weakness. After four days, critical symptoms may occur, such as severe hypotension, shortness of breath, mental confusion, loss of consciousness, toxic shock, generalized edema, large blood-filled blisters, and renal, hepatic, and pulmonary failure, which can lead to death. Sepsis is the most common complication in individuals who die from necrotizing fasciitis[20,28,31,35-37,44,45,46,52,55].

In this context, it is extremely important that professionals working in Primary Care are fully aware of the relevant signs and symptoms in order to enable early recognition of the condition, allowing for appropriate referral and treatment[10]. Moreover, in the hospital setting, professionals should perform frequent physical assessments of the affected area in order to monitor the progression of signs and symptoms, changes in the skin, and the ongoing need for surgical debridement[11,22,25,27,29].

The main laboratory tests requested include a complete blood count with white blood cell count, protein, blood glucose, albumin, prealbumin, and electrolytes (sodium, potassium, urea, and creatinine); urinary nitrogen levels and C-reactive protein are important parameters for assessing the patient's condition and guiding treatment[22,28]. The aforementioned laboratory tests are important complementary tools in the diagnosis of NAand assist in guiding treatment and assessing disease severity[22], they include liver function tests, coagulation profile, albumin, lactic acid, antibiogram, culture, and blood culture. These data help monitor organ function, nutritional status, electrolyte balance, and the progression of the infection[10,20,34,36,37,40]. It is important to highlight that hypocalcemia is an early diagnostic finding for necrotizing fasciitis, according to the literature[33].

The diagnosis of NF is predominantly clinical, based primarily on the patient's signs and symptoms, along with a careful physical examination. However, imaging tests can be useful to confirm the diagnosis and help assess the extent of the infection. Abdominal X-rays, ultrasound, computed tomography (CT), and magnetic resonance imaging (MRI), for example, may reveal suggestive signs of infection, such as fluid accumulation and gas in the soft tissues[20,36,46].

Category 4 — Patient-centered care

Care for individuals with NF must go beyond the wound itself. Skills in assessment, clinical decision-making, and critical thinking are essential for nurses to promote patient recovery. Individualizing the care plan is crucial for continuity and efficiency, and nurses should assess the patient's support system and coping abilities from admission through discharge. Additionally, measures such as promoting adequate nutrition, managing pain, organizing sleep and rest, updating immunizations, providing social support, resuming daily activities, teaching coping skills, and educating the family about the healing process are vital and should be implemented by the nursing team[14,34,40,47].

The psychological consequences of NF stem from extreme pain, painful dressing changes, physical disfigurement, and emotional factors such as anxiety, fear, and depression, all of which may delay the healing process. Nurses should encourage realistic expectations regarding the appearance of skin grafts and reconstructive surgery, as well as set achievable goals for the rehabilitation process. It is therapeutic to encourage patients to express their emotions related to disfigurement, role conflict, and sexual function[14]. In addition, the appropriate administration of psychotropic and analgesic medications, optimal nutrition, and psychological and social services support for patients and their families will aid in both physical and emotional healingl[25,35].

Nutritional support for patients with NF is important for wound healing and for fighting infection [10,21]. Many patients with will be in a hypermetabolic state due to the infectious process and will have a compromised nutritional status. Caloric and protein intake should be twice the normal basal requirement [11,13,22,28,34,38,44,45].

Psychosocial support is also extremely important and should not be underestimated. Due to the rapid and aggressive course of the disease, patients are emotionally vulnerable, often experiencing anxiety and depression. Numerous factors contribute to this, including prolonged hospitalization, severe pain, painful dressing changes, serial surgical debridement, physical disfigurement, amputation, and altered body image, all of which have financial, social, and psychological implications for both the patient and their family[22,23,28,38,46].

Pain assessment and management are fundamental aspects of nursing care, aiming to ensure patient comfort and to help monitor disease progression. In this condition, pain is intense and often disproportionate many patients experience fainting episodes during dressing changes, making it necessary to administer opioid analgesics prior to these procedures. Other possible interventions for pain management include elevating the affected limbs, applying dressings, and using complementary therapies. The use of ice packs should be avoided due to the risk of tissue ischemia[10,13,14,23,25,28,34,37,38,43,56].

Category 5 — Adjunct therapies

There are currently several adjunct therapies that contribute to wound healing, such as hyperbaric oxygen therapy (HBOT) and negative pressure wound therapy (NPWT).

HBOT significantly increases oxygen saturation in infected wounds, promoting faster healing. This is facilitated by improved antibiotic transport across cell walls, which reduces the formation of bacterial toxins. HBOT also enhances the ability of white blood cells to fight bacteria, reducing their number and exerting a bactericidal effect. Additionally, this therapy can improve healing by reducing tissue swelling, restoring new blood vessel formation, and increasing tissue oxygenation in the affected area[10,11,22,28,31,56-59].

Given these effects, HBOT has been considered an adjunct therapy in the treatment of necrotizing fasciitis, particularly for creating a hostile environment for anaerobic microorganisms. However, its effectiveness in managing this condition remains controversial, and the use of multiple sessions is not recommended. If healing does not progress as expected, it is essential to reassess the therapeutic approach, including wound care, topical therapy, antibiotic treatment, and debridement.

NPWT should also be used with caution in the management of necrotizing fasciitis, as it is an extremely aggressive condition that requires constant vigilance and thorough assessment of the wound bed. Therefore, NPWT should only be applied after effective infection control has been achieved, ensuring that the intervention does not promote bacterial proliferation or worsen the patient's clinical condition.

When applied at the appropriate time, NPWT offers several benefits for wound treatment, including reduced exudate, relief of local pain, increased blood flow to the wound bed, stimulation of granulation tissue proliferation, and infection control. These effects contribute to the overall improvement of the wound condition, making it better prepared for grafting and significantly reducing the total duration of treatment and hospitalization[20,22,30-32,39,43,44].

The mechanism of action of NPWT encompasses two main aspects: biological and physical. On the biological level, the therapy induces processes such as angiogenesis, connective tissue deposition, and extracellular matrix formation, promoting granulation tissue development and modulation of the inflammatory response. The physical effects include increased blood flow, reduction of edema, exudate control, and decreased wound dimensions, creating a more favorable environment for healing[30,42,44,60].

Category 6 — Work processes of the nurse and the nursing team

The healthcare team must have a clear understanding of the disease and its complications, in addition to providing specialized care to the patient and their family [34,41,48]. The lack of ongoing training and qualification presents a challenge for nurses in the care of patients with this condition, highlighting the importance of training programs to enhance professional competence[31,35,48].

It is essential for nurses to apply their scientific knowledge in practice, establishing their professional role and defining their position within the healthcare team. Patient care focused on human needs aims to help individuals achieve an

optimal level of health and well-being, taking into account various aspects such as physiological, psychological, social, and spiritual factors[46,48,52].

The importance of a thorough medical history and complete physical examination is emphasized for the accurate diagnosis of NA[27,29,33,41]. The use of the Nursing Care Systematization (SAE) and the nursing process allows for the development of a targeted and effective action plan, enabling a more systematic and evidence-based approach[35,41]. The use of taxonomies such as the North American Nursing Diagnosis Association (NANDA), Nursing Interventions Classification (NIC), and Nursing Outcomes Classification (NOC) is highlighted as a tool that facilitates the unification of criteria and critical thinking for nursing professionals in care planning[20,25,34,36,37,41].

It is essential for nurses to guide and educate patients and their families about hospitalization, necessary procedures, and isolation precautions, emphasizing hand hygiene and strict adherence to instructions[22,28]. The nurse must also assess the patient's understanding of wound care and other needs in order to plan post-discharge care [34,35,48].

The nurse's role in public health education is also emphasized, through actions that promote health and prevent diseases such as necrotizing fasciitis. Society should be aware of risk factors and be empowered to identify health problems, encouraging self-care[34,35,39,48].

Study limitations

This review was limited by the predominance of low-level evidence studies and the scarcity of publications specifically addressing stomatherapy, which required the inclusion of studies with generalist nurses. The heterogeneity of contexts analyzed and the limited number of recent publications are also noteworthy. These limitations highlight the need for more robust and updated clinical research.

Recommendations

It is recommended to develop more robust and multicenter clinical studies to assess the role of stomal therapy nurses in necrotizing fasciitis, particularly in the Brazilian context. Continuous professional training is essential, focusing on early recognition of the disease, interdisciplinary management, and the implementation of evidence-based care technologies. Furthermore, increasing recent scientific production on the topic is crucial to support more specific care protocols and strengthen clinical practice.

CONCLUSION

The analysis of scientific articles highlighted the crucial role of nurses in the care of necrotizing fasciitis, ranging from direct wound management to emotional and educational support for patients and their families. Close monitoring of signs and symptoms allows for early interventions, reducing hospital stay, costs, and morbidity and mortality. Stomal therapy nurses play a key role in preventing complications and promoting self-care. Their proactive approach, combined with effective coordination among the healthcare team, maximizes positive treatment outcomes. Investment in research and ongoing training is essential to strengthen nursing care in this severe condition.

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software, supervision, validation, visualization. RMSP: project administration, formal analysis, conceptualization, data curation, writing – original draft, writing – review and editing, investigation, methodology, funding acquisition, resources, software, supervision, validation, visualization. GMS: formal analysis, conceptualization, writing – review and editing, investigation, methodology, validation, visualization. PY: formal analysis, conceptualization, writing – review and editing, investigation, methodology, validation, visualization. TRH: formal analysis, conceptualization, writing – review and editing, investigation, methodology, validation, visualization. CS: formal analysis, conceptualization, writing – review and editing, investigation, methodology, validation, visualization.

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REFERENCES

1. Antuña VL, Puchades F, Tapial JM, Ribelles JC, Sanz F, Tamarit JJ. Eosinophilic fasciitis following SARS-CoV-2 vaccination. JAAD Case Rep. 2023;36:11-4. https://doi.org/10.1016/j.jdcr.2022.11.038
2. Vlaic J, Fattorini MZ, Dukaric N, Tomas D. Proliferative fasciitis: a rare cause of disturbances in an adolescent hand. Acta Orthop Traumatol Turc. 2020;54(5):557-60. https://doi.org/10.5152/j.aott.2020.19033
3. Gomes P, Recchioni C, Vieira, WL, Canôas RS, Daruje R, Ramacciato J. Fasciíte necrosante cervical em adolescente: relato de caso. Braz J Develop. 2020;6(8):60473-81. https://doi.org/10.34117/bjdv6n8-456
4. Souza FSL, Gomes FC, Valle NSB, Coelho EE. Assistência de enfermagem ao portador da síndrome de Fournier: uma pesquisa integrativa. Braz J Surg Clin Res. 2019;26(2):54-62.
5. Santos EI, Vale ALVV, Reis ICPM, Neves PB, Pontes CM, Camara SGC. Brazilian scientific evidence on Fournier 's gangrene. Rev Rene. 2014;15(6):1047-55. https://doi.org/10.15253/2175-6783.2014000600019
6. Salcido RS. Necrotizing fasciitis: reviewing the causes and treatment strategies. Adv Skin Wound Care. 2007;20(5):288-93; quiz 294-5. https://doi.org/10.1097/01.ASW.0000269317.76380.3b
7. Soares TH, Penna JTM, Penna LG, Machado JA, Andrade IF, Almeida RC, et al. Diagnóstico e tratamento da Fasciíte Necrotizante: relato de dois casos. Revista Médica de Minas Gerais. 2008;18(2):136-40.
8. Rosich Soteras A, Serrahima Mackay A, Borràs-Maixenchs N, Arcarons Martí J. Catheter related necrotizing fasciitis in hematological patients: case report and implications for nursing. Ann Oncol. 2019;30(Suppl 5):843. https://doi.org/10.1093/annonc/mdz276.028
9. Elliott D, Kufera JA, Myers RA. The microbiology of necrotizing soft tissue infections. Am J Surg. 2000;179(5):361-6. https://doi.org/10.1016/s0002-9610(00)00360-3
10. Timmons J. Necrotizing fasciitis in primary care: presentation, risk factors and treatment. Br J Community Nurs. 2004;9(9):S16-24. https://doi.org/10.12968/bjcn.2004.9.Sup3.15942
11. Fritzsche SD. Soft-tissue infection: necrotizing fasciitis. Plast Surg Nurs. 2013;23(4):155-9. https://doi.org/10.1097/00006527-200323040-00003
12. Suijker J, Zheng KJ, Pijpe A, Nasroe F, Meij-de Vries A. The skin-sparing debridement technique in necrotizing soft-tissue infections: a systematic review. J Surg Res. 2021;264:296-308. https://doi.org/10.1016/j.jss.2021.03.001
13. Vallejo AC, Carrasco RG, Fernández MAM. Utilización de un sistema de derivación fecal en una paciente que desarrolla una fascitis necrotizante de la zona génito-perineal en una unidad de traumatología. Enferm Clín. 2010;20(6):370-3. https://doi.org/10.1016/j.enfcli.2010.07.007
14. Fink A, DeLuca G. Necrotizing fasciitis: pathophysiology and treatment. Dermatol Nurs. 2002;14(5):324-7. PMID: 12430520.
15. Carbonetti F, Carusi V, Guidi M, David V. Necrotizing fasciitis: a comprehensive review. Clin Ter. 2015;166(2):e132-9. https://doi.org/10.7417/CT.2015.1836
16. Egerod I, Knudsen VE, Andersson AE, Fagerdahl AM. Patient and family experience 2 years after necrotizing soft-tissue infection: a longitudinal qualitative investigation. J Adv Nurs. 2023;79(8):2924-35. https://doi.org/10.1111/jan.15535

17. Heerschap C, Duff V. The value of nurses specialized in wound, ostomy, and continence: a systematic review. Adv Skin Wound Care. 2021;34(10):551-9. https://doi.org/10.1097/01.ASW.0000790468.10881.90

18. Souza MT, Silva MD, Carvalho R. Integrative review: what is it? How to do it? Einstein (São Paulo). 2010;8(1):102-6. https://doi.org/10.1590/S1679-45082010RW1134

19. Karino ME, Felli VEA. Evidence-based nursing: advances and innovations in systematic reviews. Ciência, Cuidado e Saúde. 2012;11:11-5.

20. Harrington DH, Lenahan CM, Sanders RM. A practitioner's guide to necrotizing fasciitis. Nurse Pract. 2015;40(4):48-54; quis 54-5. https://doi.org/10.1097/01.NPR.0000461947.30915.0c

21. Gillen PB. Necrotizing fasciitis: early recognition and aggressive treatment remain important. J Wound Ostomy Continence Nurs. 1995;22(5):219-22. https://doi.org/10.1097/00152192-199509000-00008

22. Astorino T, Genrich I, Macgregor L, Victor CS, Eckhouse DR, Barbour L. Necrotizing fasciitis: early detection may save your patient´s limb. Orthop Nurs. 2009;28(2):70-6; quiz 77-8. https://doi.org/10.1097/NOR.0b013e318199ecb4

23. Magel DC. The nurse's role in managing necrotizing fasciitis. AORN J. 2008;88(6):977-82; quiz 983-6. https://doi.org/10.1016/j.aorn.2008.08.014

24. Purnell D, Hazlett T, Alexander SL. A new weapon against severe sepsis related to necrotizing fasciitis. Dimens Crit Care Nurs. 2004;23(1):18-23. https://doi.org/10.1097/00003465-200401000-00006

25. Schroeder JL, Steinke EE. Necrotizing fasciitis--the importance of early diagnosis and debridement. AORN J. 2005;82(6):1031-40. https://doi.org/10.1016/s0001-2092(06)60255-x

26. Ferreira MC, Tuma Júnior P, Carvalho VF, Kamamoto F. Complex wounds. Clinics. 2006;61(6):571-8. https://doi.org/10.1590/S1807-59322006000600014

27. Fodel LP, Smith AM. Necrotizing soft tissue infections: a review of diagnosis, management, and implications for NP practice. J Nurse Pract. 2014;10(4):245-8. https://doi.org/10.1016/j.nurpra.2014.01.003

28. Ruth-Sahd L, Gonzales M. Multiple dimensions of caring for a patient with acute necrotizing fasciitis. Dimens Crit Care Nurs. 2006;25(1):15-21. https://doi.org/10.1097/00003465-200601000-00005

29. Guevel LH, Shifrin MM. Necrotizing fasciitis in the adult patient: implications for nurse practitioners. J Nurse Pract. 2020;16(5):335-7. https://doi.org/10.1016/j.nurpra.2020.02.008

30. Jones EG, El-Zawahry AM. Curative treatment without surgical reconstruction after perineal debridement of Fournier's gangrene. J Wound Ostomy Continence Nurs. 2012;39(1):98-102. https://doi.org/10.1097/WON.0b013e31823fe212

31. Alves AMRS, Morais JLP, Nóbrega LMB, Lima KA, Rodrigues FA, Oliveira JS, et al. Gangrena de Fournier: conhecimento de enfermeiros sobre a doença e suas experiências no cuidado aos pacientes. Enferm Bras. 2002;21(4):375-87. https://doi.org/10.33233/eb.v21i4.4805

32. Cano A, Wigoda P. State-of-the-art adjuncts in the treatment of necrotizing fasciitis improves survivability and cosmesis. J Wound Ostomy Continence Nurs. 2007;34(3):S9. https://doi.org/10.1097/01.WON.0000270862.84535.16

33. Özşaker E, Yavuz M, Altınbaş Y, Kozë BS, Nurülke B. The care of a patient with Fournier's gangrene. Ulus Travma Acil Cerrahi Derg. 2015;21(1):71-4. https://doi.org/10.5505/tjtes.2015.22735

34. Bashford C, Yin T, Pack J. Necrotizing fasciitis: a model nursing care plan. Medsurg Nurs. 2002;11(1):37-42; quis 43. PMID: 11901612.

35. Santos AA, Silva FCL, Souza KRF, Póvoas FTX, Bastos MLA, Lúcio IML. Assistência de enfermagem a puérpera com fasceíte necrotizante: Experience report. Rev Enferm UFPE on line. 2013;7(4):1248-53. https://doi.org/10.5205/r euol.3188-26334-1-LE.0704201323

36. Mondragón-Gómez S, Jiménez-Utrilla J. Proceso de atención de Enfermería a pacientes con gangrena de Fournier. Enferm Univ. 2013;10(2):58-66.

37. Symonds H. The community nurse's role in early identification of necrotising fasciitis: raising awareness. J Community Nurs. 2018;32(3):45-9.

38. Skacel C, Boyle M. A five year review of anaerobic, necrotizing soft tissue infections: a nursing perspective. Aust Crit Care. 1992;5(4):15-7, 18-20. https://doi.org/10.1016/s1036-7314(92)70064-2

39. Durham LM. Necrotising fasciitis--the importance of both evidence-based nursing care and reflective practice. Journal of Stomal Therapy Australia. 2015;35(4):12-4.

40. Foster L, Smith E, Moore P, Turton P. The use of a hydrofiber dressing in fulminating necrotizing fasciitis. Br J Nurs. 2001;10(11 Suppl):S36-8, S41-2. https://doi.org/10.12968/bjon.2001.10.Sup2.12343

41. Cruz RAO, Andrade LL, Arruda AJCG. Produção científica sobre gangrena de Fournier e os cuidados de enfermagem: revisão integrativa. Rev Enferm UFPE on line. 2016;10(5):4329-35. https://doi.org/10.5205/1981-8963-v10i5a11180p4329-4335-2016

42. Pour SM. Use of negative pressure wound therapy with silver base dressing for necrotizing fasciitis. J Wound Ostomy Continence Nurs. 2011;38(4):449-52. https://doi.org/10.1097/WON.0b013e31821e43f1

43. Meekul J, Chotirosniramit A, Himakalasa W, Orrapin S, Wongthanee A, Pongtam O, et al. A randomized controlled trial on the outcome in comparing an alginate silver dressing with a conventional treatment of a necrotizing fasciitis wound. Int J Low Extrem Wounds. 2017;16(2):108-13. https://doi.org/10.1177/1534734617701051

44. Niehuser ME. Negative pressure therapy dressing application in a patient with Fournier's gangrene. J Wound Ostomy Continence Nurs. 2008;35(3):S19. https://doi.org/10.1097/01.WON.0000319303.21186.53

45. Moorman S. Surviving life-threatening illness: keys to optimal nursing care. J Christ Nurs. 2010;27(1):18-24; quiz 25-6. https://doi.org/10.1097/01.cnj.0000365985.95141.3d

46. Gully S. Nursing management of necrotising fasciitis. Nurs Stand. 2022;16(52):39-42. https://doi.org/10.7748/ns2002.09.16.52.39.c3265

47. Gwyn L. A divine encounter. J Christ Nurs. 2012;29(3):178-9. https://doi.org/10.1097/cnj.0b013e3182579951

48. Mota CMG, Borges JA, Araújo AKL, Batista NJC. Atuação do enfermeiro na prevenção da gangrena de Fournier: atenção à saúde do homem. Enfermagem. 2014;13(4):242-8.

49. Melnyk BM, Fineout-Overholt E. Evidence-based practice in nursing & healthcare: a guide to best practice. Philadelphia: Lippincott Willians & Wilkins; 2022.

50. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. A declaração PRISMA 2020: diretriz atualizada para relatar revisões sistemáticas. Rev Panam Salud Publica. 2022;46:e112. https://doi.org/10.26633/RPSP.2022.112

51. Ferreira E, Lucas R, Rossi LA, Andrad, D. Dressing of burned patients' wounds: a literature review. Rev Esc Enferm USP. 2003;37(1):44-51. https://doi.org/10.1590/S0080-62342003000100006

52. Inácio MF, Lima RP, Rizzo Neto S, Lopes FA, Pantaroto M, Sousa AV. Epidemiological study on Fournier syndrome in a tertiary hospital in Jundiaí-SP from October 2016 to October 2018. J Coloproctol (Rio J.). 2020;40(1):37-42. https://doi.org/10.1016/j.jcol.2019.10.005

53. Coutinho Júnior NFL, Bezerra SMG, Branco NFLC, Carvalho MRD, Rocha Júnior K, Ferreira LFO, et al. TIME wound assessment tool: interobserver agreement. Estima, Braz J Enterostomal Ther. 2020;18:e1720. https://doi.org/10.30886/estima.v18.875_IN

54. Salomé GM, Arbage CC. A aplicabilidade da hidrofibra com prata em lesão provocada pela Síndrome de Fournier: Experience report. Nursing (São Paulo). 2008;11(127):566-70.

55. Tenório CEL, Lima SVC, Albuquerque AV, Cavalcanti MP, Teles F. risk factors for mortality in Fournier's gangrene in a General Hospital: use of Simplified Founier Gangrene Severe Index Score (SFGSI). Int Braz J Urol. 2018;44(1):95-101. https://doi.org/10.1590/S1677-5538.IBJU.2017.0193

56. Araujo LC, Romero B. Pain: evaluation of the fifth vital sign. A theoretical reflection. Rev Dor. 2015;16(4):291-2. https://doi.org/10.5935/1806-0013.20150060

57. Tikami KF, Simão JC, Passerotti LC, Barbosa ASAA. Perfil dos pacientes com gangrena de Fournier utilizando a oxigenoterapia hiperbárica como tratamento adjuvante. Medicina (Ribeirão Preto). 2020;53(1):21-5. https://doi.org/10.11606/issn.2176-7262.v53i1p21-25

58. Rocha ST, Castelan Filho JB, Petry MS, Bernardi RM, Bueno GB, Warmling CZ. Experiência inicial da terapia hiperbárica na síndrome de Fournier em um hospital de referência no sul catarinense. Arq Catarin Med. 2012;41(4):71-6.

59. Cirino GAR, Paiva DFF, Azevedo AH. Hyperbaric oxygen therapy or negative pressure therapy: what is the best form of treatment for patients with Fournier Syndrome? A systematic review of the literature. Res Soc Dev. 2022;11(12): e249111234558. https://doi.org/10.33448/rsd-v11i12.34558

60. Lima RVKS, Coltro PS, Farina Júnior JA. Terapia por pressão negativa no tratamento de feridas complexas. Rev Col Bras Cir. 2017;44(1):81-93. https://doi.org/10.1590/0100-69912017001001