The Role of Nursing in the Management of Skin Burns in Emergency Care at Primary Health Centers

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Abstract:

Nursing plays a vital role in the management of skin burns in emergency care settings, particularly within primary health centers. Nurses are often the first healthcare professionals to assess and treat burn injuries, providing crucial initial care that can reduce complications and promote healing. Their responsibilities include evaluating the severity of the burn, which involves understanding the degree of injury—first, second, or third degree—and determining the appropriate course of action. They administer first aid, such as cooling the burn, preventing infection through proper wound care, and managing pain. Education is also a key component, as nurses guide patients on post-burn care, signs of infection, and the importance of follow-up consultations. In addition to immediate care, nursing in primary health centers extends to preventive education and community outreach about burn safety. Nurses can play a critical role in educating communities about burn prevention strategies, such as safe cooking practices, proper use of flammable substances, and child safety around hot surfaces. This preventive approach can significantly reduce the incidence of burn injuries in the community. Furthermore, nurses collaborate with other healthcare professionals to ensure comprehensive burn management, including referral to specialized care when needed. Their holistic approach not only addresses the physical needs of burn patients but also supports psychological recovery through empathy and emotional support.

Keywords: nursing, skin burns, emergency care, primary health centers, assessment, first aid, wound care, pain management, infection prevention, community education, burn prevention, interdisciplinary collaboration, psychological support.

Introduction:

Burn injuries represent a significant global health challenge, accounting for approximately 11 million injuries annually, according to the World Health Organization (WHO). Among these, skin burns are particularly alarming due to their acute nature, varying degrees of severity, and associated complications. The management of skin burns is critical within emergency care settings, particularly at primary health centers (PHCs), which serve as the first point of contact for patients seeking medical assistance. Nursing professionals play a pivotal role in the immediate and ongoing management of burn injuries, making it imperative to understand their contributions and the complexities involved in care delivery [1].

Skin burns occur as a result of exposure to heat, chemicals, electricity, or radiation, leading to varying degrees of skin damage that can compromise structural integrity and cause systemic complications. Burns are typically categorized into three primary classifications: first-degree, second-degree, and third-degree, with each type warranting a different management approach. First-degree burns are characterized by superficial damage, primarily affecting the outer layer of skin, while second-degree burns involve deeper layers, often presenting with blisters. Third-degree burns, on the other hand, penetrate all layers of the skin, potentially affecting underlying tissues and requiring advanced medical intervention [2].

In emergency care, the initial assessment and management of burn injuries are crucial to prevent further complications, such as infection, dehydration, and hypothermia, which can arise from significant injuries. Nurses, as frontline healthcare providers, are tasked with the responsibility of not only assessing the severity of the burns but also implementing immediate treatment protocols to stabilize the patient's condition and facilitate optimal healing [3].

Primary health centers serve a critical function in the healthcare system by providing accessible and affordable medical care. Their role in managing skin burns cannot be overstated, as PHCs often handle a considerable volume of emergency cases, particularly in rural or underserved areas where specialized burn units may be geographically distant. The timely intervention by nursing staff in these settings can significantly alter patient outcomes, underscoring the need for effective training and resource allocation to equip nurses with the skills necessary for managing burn injuries [4].

Nursing encompasses a broad range of responsibilities in the emergency care setting, particularly when managing skin burns. The key roles include patient assessment, triage, wound care, pain management, and education. Upon the patient's arrival at the primary health center, the nursing staff conducts a thorough assessment, which includes evaluating the extent and depth of the burn, determining the patient's medical history, and identifying any co-morbid conditions that may complicate treatment [5].

Effective wound care is vital in the management of burns. Nurses are trained to cleanse and debride wounds, apply appropriate dressings, and maintain an aseptic environment to prevent infection. Moreover, they monitor for complications such as infection or delayed healing, providing critical documentation and communication to other healthcare professionals involved in the patient's care [6].

Pain management also plays a substantial role in the comprehensive care of burn victims. Nursing staff must assess pain levels using validated pain scales and administer analgesics as needed, ensuring patient comfort during the healing process. Furthermore, nurses educate patients and their families regarding burn care, emphasizing the importance of hygiene, dressing changes, and recognizing signs of complications [7].

Additionally, the psychological impact of burn injuries should not be underestimated. Nurses are often the first to offer emotional support to patients who may feel anxiety, fear, or distress related to their injuries. Providing a compassionate presence, along with resource referrals for psychological support, is an essential aspect of holistic nursing care [8].

The Nursing Assessment of Burn Severity:

Burn injuries represent a significant public health concern, impacting millions worldwide each year. Among the most critical aspects of burn care

management is the assessment of burn severity, which plays a crucial role in guiding treatment plans, determining the need for referral to specialized services, and predicting patient outcomes. The nursing assessment of burn severity involves a systematic approach that incorporates clinical evaluation, patient history, and an understanding of the various factors that influence burn severity [9].

Understanding Burn Severity

Burn severity is typically described in terms of depth, body surface area (BSA) affected, and the presence of associated injuries or medical comorbidities. Burns can be classified into four primary categories based on their depth, which directly affects the treatment required and patient prognosis:

1. **First-Degree Burns**: Affecting only the outer layer of skin (epidermis), first-degree burns result in redness, minor swelling, and pain. They typically heal within a week without scarring and are often associated with minor sunburns [10].
2. **Second-Degree Burns**: These burns penetrate the epidermis into the second layer of skin (dermis). They are classified into superficial partial-thickness burns, characterized by blistering and significant pain but a more favorable healing prognosis, and deep partial-thickness burns, which may require surgical intervention due to the loss of skin integrity.
3. **Third-Degree Burns**: Affecting the full thickness of the skin, third-degree burns may appear white, charred, or leathery. These burns are painless due to the destruction of nerve endings and typically require skin grafting or extensive surgical management for healing.
4. **Fourth-Degree Burns**: These severe injuries extend beyond the skin into underlying tissues, muscles, and bones, resulting in irreversible damage. Fourth-degree burns often necessitate amputation or reconstructive surgery [10].

Assessing burn severity is imperative, as it informs decisions regarding appropriate treatment interventions and potential complications such as infection, dehydration, or impairment of functional abilities.

Components of Nursing Assessment

A comprehensive nursing assessment of burn severity encompasses various domains: patient history, physical examination, and evaluation of the burn itself. The initial assessment should focus on acquiring vital data quickly and efficiently, especially in emergencies [11].

1. Patient History

Obtaining a thorough patient history is crucial in understanding the context of the burn injury. Nurses should inquire about the mechanism of injury (thermal, chemical, electrical, or radiation), time elapsed since the injury, and the total area affected. Important historical factors include:

- **Past Medical History**: Identification of underlying health conditions, such as diabetes or cardiovascular diseases, which may complicate burn healing [12].
- **Medications**: Use of immunosuppressive therapies or anticoagulants that can affect healing.
- **Allergies**: Noting any allergies to medications or topical agents is essential to avoid adverse reactions during treatment [12].

2. Physical Examination

A physical examination prioritizes an assessment of airway, breathing, and circulation (the "ABCs"), especially in cases of severe burns or when the airway may be compromised due to inhalation injuries. Subsequently, nurses should systematically evaluate the burn injuries, documenting:

- **Location**: The anatomical site of the burns, as certain locations (like the face, hands, perineum, and major joints) may be more functionally significant [13].

- **Depth of Burn**: As previously defined, determining whether burns are first, second, third, or fourth degree is vital.
- **Total Body Surface Area (TBSA)**: Accurate estimation of the burn size is crucial for fluid resuscitation calculations. The "Rule of Nines" can be utilized for adults, dividing the body into sections, each contributing 9% (or multiples thereof) to the total surface area. Although less applicable for pediatric patients, the Lund and Browder chart or a percentage of the palm method can be used to gauge burn size [14].

3. Evaluation of Burn Characteristics

In addition to the depth and TBSA, evaluating other characteristics of the burn is essential. Nurses should assess:

- **Wound Condition**: Presence of blisters, eschar, or odor can indicate potential complications such as infection [15].
- **Pain Assessment**: Understanding the patient's pain level is essential for providing adequate pain management.
- **Functional Assessment**: Evaluating how the burn may impact mobility and functionality, particularly for burns around joints or involving large areas [15].

Tools and Scales for Assessment

Several established tools and scales aid nurses in assessing burn severity and guiding treatment decisions. The **Lund and Browder chart** provides a more precise estimation of TBSA, particularly in children, while the **Baxter formula** calculates fluid requirements for burn care. The **Abbreviated Burn Severity Index (ABSI)** is another tool that incorporates multiple factors, including age, inhalation injury, and percentage of TBSA burned, to predict outcomes and guide interventions [16].

Nursing Implications

The nursing implications of understanding and performing a burn severity assessment are profound. Adequate assessment guides interventions such as:

- **Fluid Resuscitation**: Properly calculating fluid needs based on TBSA and individual patient characteristics is crucial to prevent complications like shock [16].
- **Pain Management**: Identification of pain levels allows for the timely administration of analgesics and interventions to promote comfort.
- **Infection Control**: Assessing wound characteristics helps in implementing appropriate dressings and determining when to initiate antibiotic therapy.
- **Psychosocial Support**: Burns can have significant psychological implications, necessitating a holistic approach to care that includes emotional support for the patient and family [16].

Immediate Nursing Interventions for Burn Treatment:

Burn injuries can result from various sources, including thermal (heat), electrical, chemical, and radiation. Given the potential for both physical and psychological harm that burns cause, immediate nursing interventions are essential in providing effective care and improving patient outcomes [17].

Assessment and Initial Response

The initial assessment begins as soon as a nurse arrives on the scene or the patient arrives in the emergency care setting. A systematic approach, often employing the ABCDE method (Airway, Breathing, Circulation, Disability, Exposure), is crucial for effective evaluation and management. If the burn results from thermal or chemical sources, a focus on airway protection becomes paramount, as swelling can occur rapidly [17].

1. **Airway and Breathing**: Assessing the airway is critical, especially in cases of facial or neck burns where edema can obstruct breathing. Inhalation injuries are also a

concern in thermal burns, particularly in confined spaces. If airway obstruction is suspected, the nurse should be prepared to perform intubation or other advanced airway management as necessary [18].

2. **Circulation**: Assessing the circulatory status involves examining the patient's vital signs and monitoring for signs of shock. In cases of significant burn injuries, fluid resuscitation may be needed, and nursing staff should begin calculating the required volumes based on established protocols, like the Parkland formula, which guides fluid replacement in burn patients.

3. **Disability and Exposure**: A quick neurological assessment using the AVPU scale (Alert, Verbal, Pain, Unresponsive) helps identify any immediate threats to consciousness. Covering all burned areas while preventing hypothermia through careful exposure of the body can help minimize further complications [18].

Stabilization and Fluid Resuscitation

Once initial assessments are completed, the next step involves stabilization of the patient. Following the principles of the American Burn Association, fluid resuscitation is often the first-line treatment in burn victims, especially in those with extensive burns covering more than 10% of the total body surface area (TBSA). Nurses must promptly initiate intravenous access for fluid administration to restore the intravascular volume and maintain tissue perfusion [19].

Crystalloids, typically Lactated Ringer's solution, are commonly used for fluid resuscitation. The nurse's responsibility includes frequent monitoring of urine output, heart rate, and blood pressure to adjust fluid therapy as per patient needs and to guide further assessments. Maintaining a urine output of 30 to 50 mL/hr in adults is often a target threshold indicating adequate fluid resuscitation [19].

Wound Management

Effective burn care includes appropriate wound management, which begins shortly after transport to the medical facility. Following initial assessment and stabilization, nursing interventions focus on cleaning and protecting the burned skin to minimize infection risk and promote healing [20].

1. **Cleansing**: The nurse must carefully cleanse the burn area to remove debris, dirt, and any potential contaminants. This can involve rinsing with sterile saline or running water, especially for chemical burns, where flushing is necessary to remove the offending agent.

2. **Debridement**: Assessment of the burn depth is essential for determining the need for debridement. For partial thickness burns (second-degree burns), the nurse may debride blisters that are large or painful. For full-thickness burns (third-degree burns), a more thorough evaluation by a physician may be warranted for surgical intervention.

3. **Dressing**: Application of appropriate dressings is vital. Non-adherent dressings and antimicrobial or silver sulfadiazine products can be used to cover the burned area to help prevent infection. Nurses should educate patients and families on maintaining dressing integrity and recognizing signs of infection [21].

Pain Control

Burns cause significant pain, and managing this pain is critical in care approaches. Pain management protocols should incorporate both pharmacological and non-pharmacological interventions.

1. **Medications**: Administering analgesics, such as opioids, can relieve acute pain. Nurses must closely monitor for side effects such as respiratory depression and sedation, adjusting dosages accordingly [22].

2. **Non-pharmacological methods**: Complementary strategies such as relaxation techniques, guided imagery, and music therapy may help alleviate pain perception. Providing a comforting and supportive

environment to ease anxiety also contributes to pain management [22].

Emotional and Psychological Support

Burn injuries can lead to considerable emotional distress alongside physical trauma. Addressing psychological needs is as vital as physical interventions.

1. **Patient and Family Support**: Nurses play a crucial role in providing emotional support to both the affected individual and their family members. Effective communication, coupled with education about burn care and expected recovery processes, can reduce anxiety levels [23].
2. **Referral to Specialists**: In cases of significant psychological impact, referral to a psychologist or psychiatric specialist should be considered. Providing access to counseling services is essential for coping with the trauma of burn injuries and fostering resilience [23].

Pain Management Strategies for Burn Patients:

Pain experiences among burn patients are multifaceted, often characterized by different types of pain: acute pain, which occurs in the direct aftermath of the injury; procedural pain, which emerges during wound care and rehabilitation; and chronic pain, which may develop in the months and years following the injury. The severity of burn injuries can significantly influence pain experiences, with deeper burns typically correlating with increased pain sensitivity. Central sensitization — an amplification of nociceptive signals in the central nervous system — can also contribute to heightened pain experiences in burn patients, making effective management crucial [24].

Pharmacological Approaches

Pharmacological interventions are a cornerstone of pain management for burn patients and can be classified into several categories:

1. **Opioids**: These are often the first line of defense for managing moderate to severe acute pain associated with burns. Morphine, fentanyl, and hydromorphone are commonly administered to provide analgesic relief. Opioids act on the central nervous system to inhibit pain pathways; however, their use must be carefully monitored due to potential side effects, such as respiratory depression, dependence, and constipation. It is also important to tailor dosage to individual patients and consider factors such as pain intensity, previous opioid use, and concurrent medications [25].
2. **Non-Opioid Analgesics**: Non-steroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen and ketorolac, can be effective when used alone or in conjunction with opioids. They help to reduce pain and inflammation by inhibiting the synthesis of prostaglandins. Acetaminophen is another commonly used non-opioid that can be beneficial for burn pain, especially in the management of mild to moderate pain. The use of multimodal analgesia, or the combination of different classes of pain medications, is increasingly recognized as a way to enhance pain relief and minimize opioid use [26].
3. **Adjuvant Medications**: Certain medications not primarily designed for pain relief can be effective for managing pain in burn patients. Antidepressants (such as tricyclic antidepressants and selective serotonin reuptake inhibitors) and anticonvulsants (such as gabapentin and pregabalin) may be used to alleviate neuropathic pain, which can sometimes develop following a severe burn injury. By modulating the way the nervous system processes pain signals, these medications can bolster overall pain management strategies [27].

Non-Pharmacological Interventions

In addition to pharmacological methods, a variety of non-pharmacological strategies can be employed to enhance pain management for burn patients:

1. **Physical Therapy**: Rehabilitation plays a significant role in pain management, particularly during the healing and recovery phases. Physical therapy can help patients regain mobility and function while also reducing pain through exercises designed to strengthen muscles and promote range of motion. Techniques such as hydrotherapy, where patients engage in exercises in water, can be particularly soothing and effective [28].
2. **Psychological Approaches**: Cognitive-behavioral therapy (CBT) can be impactful in reducing pain perception and enhancing coping strategies among burn patients. CBT techniques may include relaxation training, mindfulness, and guided imagery, which can help patients manage their stress and anxiety related to pain. Engaging in mindfulness practices fosters acceptance and can significantly improve the overall quality of life [29].
3. **Complementary Therapies**: Various complementary treatments, such as acupuncture, massage therapy, and aromatherapy, can also serve as adjuncts to traditional pain management. While the scientific evidence supporting these methods can be variable, many patients report subjective improvements in pain symptoms through their use [30].

Psychological Support

The psychological impact of burn injuries cannot be underestimated. Beyond physical pain, burn patients often face emotional and psychological challenges, including anxiety, depression, and post-traumatic stress disorder (PTSD). The integration of mental health professionals into the care team can provide invaluable support. Regular psychological counseling can assist patients in discussing their fears and emotions related to pain and recovery, fostering resilience and adapting coping strategies. Furthermore, support groups can offer communal experiences that validate feelings and encourage social connections, which are often beneficial in promoting emotional healing [31].

An effective pain management strategy for burn patients hinges on a collaborative, multidisciplinary approach. A team consisting of physicians, nurses, pain specialists, physical and occupational therapists, and psychologists can work together to assess and address the diverse pain and rehabilitation needs of the patient. This integrative care model ensures that all aspects of the patient's well-being are considered, tailoring interventions to individual circumstances, and fostering a more comprehensive treatment environment [32].

Infection Prevention and Wound Care in Burn Cases:

Burn injuries are classified into degrees based on the severity and depth of skin damage. First-degree burns affect only the outer layer of skin (epidermis), causing redness and pain but usually heal without scarring. Second-degree burns damage both the epidermis and part of the underlying dermis, resulting in blisters and severe pain. Third-degree burns, which extend through the dermis and affect deeper tissues, can appear white, charred, or leathery and often require surgical intervention. Fourth-degree burns extend through the skin into underlying fat, muscles, and bones, necessitating complex treatment protocols and an extended healing process [33].

Given the varying degrees of burns, the associated risks of infection escalate with the severity of the injury. Deeper burns compromise the skin's protective barrier, leading to increased susceptibility to bacterial invasion and subsequent systemic infection, such as sepsis. Furthermore, burn injuries often occur in a setting conducive to contamination—open wounds, foreign debris, and the potential for environmental pathogens increase the urgency of infection control strategies [34].

Infection Prevention Strategies

Preventing infection in burn cases is a multidimensional approach encompassing various strategies and interventions:

1. **Immediate First Aid**: The initial response to any burn injury plays a critical role in preventing infection. Cooling the burn with running water for at least 10-20 minutes helps reduce the temperature of the skin and minimize tissue damage. Clean, sterile dressings should be applied to protect the burn area from external contaminants [35].

2. **Hospital Protocols**: Once a burn victim is treated in a clinical setting, strict adherence to infection control protocols is necessary. This includes maintaining a sterile environment, employing barrier methods, and ensuring that healthcare personnel follow hygiene practices such as handwashing and the use of personal protective equipment (PPE) [36].

3. **Wound Assessment and Management**: Regular assessment of burn wounds is crucial to identify early signs of infection. Healthcare providers should monitor for increased redness, swelling, exudate, and systemic symptoms such as fever. In cases of suspected infection, wound cultures can help identify pathogens, guiding targeted antimicrobial therapy.

4. **Use of Topical Antimicrobials**: To minimize the risk of infection, various topical antimicrobial agents are available. Silver sulfadiazine, honey-based dressings, and iodine-based preparations have shown efficacy in reducing microbial load on burn wounds. The choice of antimicrobial should consider burn depth, wound characteristics, and potential allergic reactions [37].

5. **Systemic Antibiotics**: In cases of extensive burns or when there is evidence of systemic infection, initiation of broad-spectrum intravenous antibiotics becomes imperative. The use of antibiotics should be judicious to prevent the development of antibiotic-resistant bacteria.

6. **Hydration and Nutrition**: Fluid resuscitation is critical in the management of burn patients, especially those with extensive injuries. Proper hydration supports the immune system, while adequate nutritional support—rich in proteins and calories—promotes wound healing and fortifies the body against infection [38].

Effective Wound Care Techniques

Wound care in burn cases is not merely about keeping a wound clean; it involves a comprehensive approach that promotes optimal healing while preventing complications. Effective wound care techniques include:

1. **Debridement**: Removal of necrotic tissue is essential in burn management. Debridement can be performed surgically or through enzymatic methods, facilitating granulation tissue formation and reducing infection risk. This process requires careful consideration of the patient's pain levels and overall health status [39].

2. **Moisture Management**: Maintaining an appropriate level of moisture in the wound bed is vital. Burn wounds, when hydrated adequately, create an optimal environment for cellular activities necessary for healing. Various dressing materials, such as hydrocolloids, foams, and alginates, can assist in maintaining moisture balance while protecting the wound from external factors [40].

3. **Dressing Changes**: Frequency of dressing changes should be determined on a case-by-case basis, taking into account the type and extent of the burn, the presence of exudate, and clinical assessment findings. Dressing changes provide an opportunity to assess the wound and look for signs of infection, which are crucial for adjusting treatment plans accordingly [41].

4. **Symptom Management**: Successful wound care involves addressing pain and discomfort, which can indirectly influence the healing process. Utilizing appropriate analgesics, both pharmacological and non-

pharmacological (like cold therapy or relaxation techniques), can enhance patient comfort and promote compliance with wound care protocols [42].

5. **Patient and Family Education**: Empowering patients and their families through education about wound care is crucial in fostering compliance and improving outcomes. They should understand the importance of keeping the wounds clean, recognizing infection signs, and adhering to prescribed treatment regimens, including dressings and medications [43].

Patient Education and Health Promotion on Burn Safety:

Burn injuries are a significant public health concern, representing a major cause of morbidity and mortality worldwide. They can occur in various settings, from households to workplaces, and can result in severe physical, emotional, and financial ramifications for individuals and families. The implications of burn injuries extend beyond the immediate pain and suffering; they can lead to long-term disabilities, psychological issues, and substantial healthcare costs. Therefore, patient education and health promotion on burn safety are crucial to preventing these injuries and ensuring that individuals are adequately prepared to respond to burn incidents when they occur [44].

Understanding Burns

Burns can be categorized based on their severity and the depth of tissue damage:

1. **First-Degree Burns**: These affect only the outer layer of skin (epidermis) and are characterized by redness and pain, like a mild sunburn [45].
2. **Second-Degree Burns**: These involve both the epidermis and the second layer of skin (dermis), resulting in blisters, swelling, and more intense pain.
3. **Third-Degree Burns**: These burns penetrate the full thickness of the skin, damaging underlying tissues. The affected area may appear white, charred, or leathery and is typically painless due to nerve damage.
4. **Fourth-Degree Burns**: The most severe type, these burns extend beyond the skin into deeper tissues, such as muscles and bones. They hence require extensive medical interventions, surgical procedures, and rehabilitation [45].

Knowledge of these classifications is essential for both prevention and effective response in the event of an incident. Promoting awareness about burn severity is not just an educational directive but a vital aspect of overarching health literacy.

The Role of Patient Education

Patient education on burn safety begins at various stages of one's life. Infants, children, and the elderly are particularly vulnerable to burn injuries and should be the focus of targeted educational initiatives [46].

1. Home Safety Education: The majority of burn injuries occur in the home. Education programs should emphasize the importance of creating a safe living environment. This may include:

- **Kitchen Safety**: Using pot handles that face inward, employing splatter guards, and keeping hot liquids out of reach of small children [47].
- **Electrical Safety**: Caution about overloaded sockets, use of appropriate wattage for bulbs, and keeping cords out of reach.
- **Fire Safety**: Teaching proper storage of flammable materials, maintaining functional smoke detectors, and discussing the importance of having an evacuation plan in the event of a fire [47].

2. Workplace Training: In the context of occupational health, industries with higher burn risk (such as manufacturing, food service, and construction) require specialized training programs. Workers should be educated about proper handling of hazardous materials, personal protective gear (PPE), and emergency response protocols. Routine safety

drills can foster a culture of awareness and preparedness [48].

3. Public Awareness Campaigns: Many organizations engage in public health campaigns aimed at improving overall awareness about burn prevention. These campaigns utilize various media platforms, including social media, posters, and community events, to reach a broader audience. Educating the community about the dangers of fireworks, safe cooking practices, and the importance of sunscreen can significantly contribute to reduced burn incidences [48].

Health Promotion Strategies

In addition to patient education, health promotion strategies are essential components of improving burn safety. These strategies can promote healthy behaviors, enhance community engagement, and improve injury prevention outcomes [49].

1. Community Workshops: Organizing regular community workshops can provide hands-on training for individuals and families on burn safety practices and emergency response. Demonstrating the first aid treatment for burns, including cooling the burn under running water and using sterile dressings, empowers individuals with the knowledge to act quickly and appropriately [50].

2. Distribution of Educational Materials: Handouts, brochures, and infographics summarizing burn safety tips and treatment procedures should be made readily available in hospitals, clinics, community health centers, and schools. These resources can serve as reminders and guides in everyday life [51].

3. Collaboration with Local Health Authorities: Partnerships between healthcare providers and local health departments can foster a more robust network for burn safety education. Health fairs, community events, and school-based programs present opportunities for wider outreach and engagement [52].

4. Continual Assessment and Improvement: Burn safety strategies and educational materials should be regularly assessed for effectiveness and updated based on emerging research and community feedback. Continuous improvement allows for the incorporation of new technology and approaches to education [52].

Interdisciplinary Collaboration in Burn Care Management:

Burn injuries can vary significantly in depth, extent, and cause, warranting distinct treatment strategies. There are three primary categories of burns: first-degree burns, which affect only the outermost skin layer; second-degree burns, which extend through the epidermis and into the dermis; and third-degree burns, which destroy both layers of skin and can involve underlying tissues. The severity of these injuries can range from mild to life-threatening, depending on factors such as burn depth, total body surface area (TBSA) affected, and the presence of inhalation injuries. Given this complexity, effective burn management extends beyond immediate medical care to incorporate pain management, psychological support, rehabilitation, and long-term outcomes [53].

The Role of Interdisciplinary Collaboration

Interdisciplinary collaboration in burn care management involves multiple healthcare professionals working together in a coordinated manner to provide comprehensive care. The key players in this collaboration typically include, but are not limited to:

1. **Surgeons**: Burn surgeons or plastic surgeons play a pivotal role in the acute management of burns. They assess the need for surgical intervention, including debridement and skin grafts, and are responsible for reconstructive procedures following extensive burns [54].

2. **Nurses**: Nurses are instrumental in the day-to-day care of burn patients. They monitor vital signs, manage pain, administer medications, provide wound care, and offer emotional support to patients and their families. Burn care nurses often specialize in areas such as wound assessment and management, patient education, and infection control [54].

3. **Physical and Occupational Therapists**: Rehabilitation is a crucial aspect of burn care

management. Physical therapists develop personalized exercise programs to enhance mobility and prevent contractures, while occupational therapists focus on improving patients' daily living skills and adapting their environments to promote independence [55].

4. **Psychologists and Social Workers**: Burn injuries often provoke profound psychological distress for both patients and their families. Psychologists provide counseling services to address trauma, anxiety, and depression, while social workers aid in navigating the complexities of healthcare systems and help patients access community resources.

5. **Dietitians**: Nutrition plays a critical role in the healing process. Dietitians collaborate with medical teams to develop individualized nutrition plans that support wound healing, optimize recovery, and address the unique caloric needs of burn patients [55].

6. **Pharmacists**: Pharmacists are essential in managing medications, ensuring that patients receive appropriate pain management, and preventing drug interactions. They also educate patients regarding their medications and potential side effects [55].

7. **Researchers**: Ongoing research in the field of burn care informs best practices and innovative treatment modalities. Researchers collaborate with clinical teams to evaluate new therapies, technology applications, and improved rehabilitation techniques [56].

The successful integration of these diverse professional perspectives enhances the quality of care and ensures that a holistic approach is applied to burn care management. Effective communication and teamwork are foundational to this collaboration, facilitating the development of comprehensive treatment plans tailored to individual patient needs [56].

Benefits of Interdisciplinary Collaboration

Interdisciplinary collaboration in burn care management yields numerous benefits that extend beyond individual patient treatment:

1. **Comprehensive Care**: An interdisciplinary approach allows for a holistic viewpoint that prioritizes not only the physical aspects of recovery but also psychological, nutritional, and rehabilitative needs. This multifaceted care leads to improved patient satisfaction and better overall outcomes [57].

2. **Enhanced Communication**: Regular team meetings and collaborative care plans enable healthcare providers to share insights, discuss challenges, and adjust treatment strategies dynamically based on patient progress. This open line of communication reduces the risk of miscommunication and enhances the efficacy of care delivery [57].

3. **Innovative Solutions**: By bringing together diverse expertise, interdisciplinary teams can leverage innovative solutions to complex problems. For instance, the integration of advanced wound care technology with established surgical practices has significantly improved healing times and outcomes [57].

4. **Continuity of Care**: Interdisciplinary collaboration helps to create a continuous care experience for patients. As they move through different stages of care—from acute management to rehabilitation—patients benefit from a streamlined approach that ensures consistent support and assessment throughout their recovery journey [57].

5. **Improved Resource Utilization**: An interdisciplinary model allows for better allocation of resources as each professional contributes their unique skills to manage patient needs efficiently. This collaborative approach can reduce unnecessary tests and procedures while optimizing resource usage [58].

Challenges and Future Directions

While interdisciplinary collaboration in burn care management is vital, it is not without its challenges. Potential barriers to effective collaboration include differences in professional cultures, communication styles, and conflicting treatment philosophies. Inadequate training in teamwork and collaboration among healthcare professionals can also hinder effective interdisciplinary approaches [58].

To overcome these challenges, healthcare institutions must emphasize the importance of collaborative education and team-building exercises. Training programs should incorporate simulations and interprofessional education initiatives to promote understanding and respect among different specialties. Additionally, leveraging technology such as electronic health records (EHRs) can facilitate communication by providing a shared platform for healthcare providers to access and update patient information [59].

Looking ahead, the future of burn care management will likely see an increased emphasis on interdisciplinary collaboration driven by advancements in technology and research. Innovations such as 3D printing for skin grafts and telehealth consultations are poised to transform traditional practices. As healthcare continues to evolve, interdisciplinary teams will be essential in adapting to these changes to provide optimal care for burn patients [59].

Evaluating Outcomes and Quality of Care for Burn Patients:

The evaluation of outcomes and quality of care for burn patients is a critical area of focus within the broader healthcare system. Burns represent a unique subset of injuries that require specialized treatment and multidisciplinary care. Given their complexity, the evaluation of treatment outcomes is necessary not just for assessing the quality of care provided but also for developing best practices, improving patient safety, and ensuring optimal recovery [60].

Burns can be caused by a variety of sources, including thermal, chemical, electrical, and radiological incidents. They are classified based on the depth of the injury: first-degree burns affect only the outer layer of skin, second-degree burns extend into the deeper layers, and third-degree burns penetrate through all skin layers and damage underlying tissues. The severity of a burn injury is often assessed using the "rule of nines," which estimates the total body surface area (TBSA) affected, with pediatric considerations necessary for more precise evaluations [61].

The complexity of caring for burn patients stems from not only the physical injuries they sustain but also the psychological, social, and economic impacts that can arise during their treatment and recovery. This necessitates a comprehensive approach to care that considers various outcome measures, including physical recovery, psychological well-being, and social reintegration [61].

The measurement of clinical outcomes in burn patients is crucial for evaluating the quality of care. Clinical outcomes typically include the rates of complications, length of hospital stay, and functional outcomes upon discharge. The incidence of infections, such as bloodstream or wound infections, is a key indicator of the effectiveness of care protocols in place. Research has shown that the presence of infections can significantly prolong recovery and complicate subsequent rehabilitation efforts [62].

Length of stay (LOS) in a burn unit is another distinct metric often associated with burn severity. While longer LOS may be warranted for severe injuries requiring extensive medical intervention—such as skin grafts, surgery, or management of complications—it can also suggest issues with the quality of care if patients remain longer than necessary without clinical justification [62].

Functional outcome measures such as range of motion, scar maturation, and return to daily activities serve as important indicators of recovery. Patients with extensive burns may require multidisciplinary rehabilitation services, including physical and occupational therapy, to regain function and improve their quality of life. Research suggests that early rehabilitation can diminish the impact of scar contractures, advancing overall recovery timelines [63].

Beyond clinical metrics, patient-reported outcomes (PROs) have emerged as vital components in evaluating burn care quality. Surveys assessing pain levels, satisfaction with treatment, psychological health, and overall well-being should be integral to any burn care program. Patient-reported experiences can illuminate gaps in care delivery, such as inadequacies in pain management, emotional support, or information transparency, which affect overall satisfaction and outcomes [63].

Incorporating PROs into the quality assessment framework allows for a more nuanced understanding of the effectiveness of treatments from the patient's perspective. Recent advancements have prompted the development of validated instruments such as the Burn Specific Health Scale (BSHS) and the Short Form Health Survey (SF-36), which aggregate information on various health dimensions that are particularly relevant for burn survivors [64].

Quality of care for burn patients is evaluated through specific indicators that can be both quantitative and qualitative. These include adherence to established treatment protocols, timely care delivery, complication rates, and infrequently occurring adverse events. Adherence to guidelines derived from evidence-based practices—such as those set forth by the American Burn Association—is paramount for minimizing complications and improving patient survival [64].

Moreover, the integration of standardized assessment tools within burn centers can ensure that all patients are evaluated consistently, which enhances both individual care and comparative outcomes across institutions. Initiatives like the National Burn Repository (NBR) provide invaluable data for benchmarking and aim to improve the quality of care by facilitating collaboration and sharing best practices among burn centers [65].

The landscape of burn care is influenced greatly by healthcare policies and reforms. Increased focus on patient-centered care and value-based reimbursement models is shifting the way burns are managed. Facilities that prioritize quality outcomes are now recognizing the financial pressures associated with lengthy hospital stays and complications, prompting them to implement strategies that enhance efficiency while maintaining a focus on patient safety and satisfaction [65].

Insurance policies also dictate access to specialized burn care services and can affect the continuity of follow-up care, thereby impacting the long-term recovery and reintegration paths for patients. Continuous advocacy is required to ensure that burn patients receive appropriate coverage for the extensive range of treatments they may require, including long-term rehabilitation and psychological support [66].

Despite the advancements in evaluating and improving the quality of burn care, numerous challenges persist. Resource limitations in burn centers, especially in underserved areas, can lead to disparities in outcomes. Additionally, the psychological effects of burn injuries—such as post-traumatic stress disorder (PTSD), depression, and anxiety—often go unrecognized, leading to inadequate support throughout recovery [66].

Furthermore, the stigma associated with disfigurement and disabilities resulting from severe burn injuries can hinder social reintegration and impact mental health. Effective burn care must address these psychosocial issues holistically, integrating mental health support services within the treatment paradigm [67].

Looking ahead, continued research into best practices for burn care quality and patient outcomes is essential. Greater emphasis should be placed on interdisciplinary approaches, combining clinical expertise with input from psychologists, social workers, and rehabilitation specialists. Investment in telehealth and remote monitoring can bolster access to follow-up care and support, particularly beneficial for patients in remote locations who might otherwise struggle to receive continuous care [68].

Furthermore, increased public awareness and education surrounding burn prevention can also play a crucial role in decreasing the incidence of burn injuries, ultimately lessening the burden on healthcare systems [69].

Conclusion:

In conclusion, nursing plays a crucial role in the effective management of skin burns within the context of primary health centers, where timely and knowledgeable care can significantly impact patient outcomes. Through comprehensive assessment, prompt intervention, and ongoing patient education, nurses not only address the immediate clinical needs of burn patients but also contribute to long-term recovery and prevention strategies. Their ability to provide empathetic care fosters trust and supports the psychological well-being of patients during a distressing time. Furthermore, collaboration with interdisciplinary teams enhances the overall quality of care, ensuring that patients receive holistic management tailored to their individual needs. As burn incidents continue to pose a public health challenge, it is essential to recognize and strengthen the vital role of nursing in both managing and preventing burn injuries, ultimately leading to improved health outcomes in communities.

References:

1. Liao C, Rossignol A. Landmarks in burn prevention. Burns. 2000;26(5):422–434. doi: 10.1016/s0305-4179(00)00026-7.
2. Adamo C, Esposito G, Lissia M, Vonella M, Zagaria N, Scuderi N. Epidemiological data on burn injuries in Angola: a retrospective study of 7230 patients. Burns. 1995;21(7):536–538. doi: 10.1016/0305-4179(95)00038-d.
3. Karpelowsky J, Wallis L, Madaree A, Rode H. South African burn society burn stabilisation protocol. South African Medical Journal. 2007;97(8):574–577.
4. Mock C, Peck M, Krug E, Haberal M. Confronting the global burden of burns: a WHO plan and a challenge. Burns. 2009;35(5):615–617. doi: 10.1016/j.burns.2008.08.016.
5. Osti E. Cutaneous burns treated with hydrogel (Burnshield) and a semipermeable adhesive film. Archives of Surgery. 2006;141(1):39–42. doi: 10.1001/archsurg.141.1.39.
6. Cahill TJ, Rode H, Millar AJW. Ashes to ashes: thermal contact burns in children caused by recreational fires. Burns. 2008;34(8):1153–1157. doi: 10.1016/j.burns.2008.05.015.
7. Van Niekerk A, Laubscher R, Laflamme L. Demographic and circumstantial accounts of burn mortality in Cape Town, South Africa, 2001–2004: an observational register based study. BMC Public Health. 2009;9, article 374 doi: 10.1186/1471-2458-9-374.
8. Atiyeh BS, Costagliola M, Hayek S. Burn prevention mechanisms and outcomes: pitfalls, failures and successes. Burns. 2009;35(2):181–193. doi: 10.1016/j.burns.2008.06.002.
9. Mzezewa S, Jonsson K, Aberg M, Salemark L. A prospective study on the epidemiology of burns in patients admitted to the Harare burn units. Burns. 1999;25(6):499–504. doi: 10.1016/s0305-4179(99)00041-8.
10. Malic CC, Karoo ROS, Austin O, Phipps A. Burns inflicted by self or by others-an 11 year snapshot. Burns. 2007;33(1):92–97. doi: 10.1016/j.burns.2006.04.008.
11. Rao K, Ali SN, Moiemen NS. Aetiology and outcome of burns in the elderly. Burns. 2006;32(7):802–805. doi: 10.1016/j.burns.2006.03.024.
12. Parbhoo A, Louw QA, Grimmer-Somers K. Burn prevention programs for children in developing countries require urgent attention: a targeted literature review. Burns. 2010;36(2):164–175. doi: 10.1016/j.burns.2009.06.215.
13. Ho WS, Ying SY, Chan HH, Chow CM. Assault by burning—a reappraisal. Burns. 2001;27(5):471–474. doi: 10.1016/s0305-4179(00)00159-5.
14. American College of Surgeons Committee on Trauma. Advanced Trauma Life Support Student Course Manual. 8th edition. Chicago, Ill, USA: 2009.
15. Australian and New Zealand Burn Association.
16. Wall J, Chimutu D, de Jone-Vink N, et al. A four year retrospective patient review of burn victims in a rural Malawian hospital. In: Proceedings of the 4th Pan African Burns Society Conference; February 2011; Cape Town, South Africa.
17. Secundo CO, Silva CCM, Feliszyn RS. Protocolo de cuidados de enfermagem ao paciente queimado na emergência: Revisão integrativa da literatura. Rev Bras Queimaduras 2019; 18(1):39–46.
18. Mola R, Fernandes FECV, Melo FBS, Oliveira LR, Lopes JBSM, Alves RPCN. Características

e complicações associadas às queimaduras de pacientes em unidade de queimados. Rev Bras Queimaduras 2018; 17(1):8–13.
19. Stoica B, Paun S, Tanase I, Negoi I, Chiotoroiu A, Beuran M, et al. Probability of survival scores in different trauma registries: a systematic review. Chirurgia (Bucur) 2016; 111(2):115–119.
20. Tetteh L, Aziato L, Mensah GP, Vehviläinen-Julkunen K, Kwegyir-Afful E. Burns pain management in Ghana: the role of nurse-patient communication. Burns 2020; 47(6):1416–1423.
21. Page MJ, Moher D, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. PRISMA 2020 explanation and elaboration: updated guidance and exemplars for reporting systematic reviews. BMJ 2021; 372:n160.
22. Zaruz MJF, Lima FM, Daibert EF, Andrade AO. Queimaduras no Triângulo Mineiro (Brasil): estudo epidemiológico de uma unidade de queimados. Rev Bras Queimaduras 2016; 15(2):97–103.
23. Barcellos LG, Silva APP, Piva JP, Rech L, Brondani TG. Characteristics and outcome of burned children admitted to a pediatric intensive care unit. Rev Bras Ter Intensiva 2018; 30(3):333–337. doi: 10.5935/0103-507X.20180045.
24. Rigon AP, Gomes KK, Posser T, Franco JL, Knihs PR, Souza PA. Perfil epidemiológico das crianças vítimas de queimaduras em um hospital infantil da Serra Catarinense. Rev Bras Queimaduras 2019; 18(2):107–112.
25. Malta DC, Bernal RTI, Lima CM, Cardoso LSM, Andrade FMD, Marcatto JO, et al. Perfil dos casos de queimadura atendidos em serviços hospitalares de urgência e emergência nas capitais brasileiras em 2017. Rev Bras Epidemiol 2020; 23(1):e200005.
26. Menezes SSC. Raciocínio clínico no ensino de graduação em enfermagem: revisão de escopo. Rev Esc Enferm USP 2015; 49(6):1032–1039.
27. Joanna Briggs Institute (JBI) Aromataris E, Munn Z. JBI Manual for Evidence Synthesis. JBI 2020.
28. Ferraz L, Pereira RPG, Pereira AMRC. Tradução do Conhecimento e os desafios contemporâneos na área da saúde: uma revisão de escopo. Saúde Debate 2019; 43(2):200–216.
29. Oliveira APBS, Peripato LA. A cobertura ideal para tratamento em paciente queimado: uma revisão integrativa da literatura. Rev Bras Queimaduras 2017; 16(3):188–193.
30. Pieptu V, Mihai A, Groza C. Burns in the Emergency Department: A One-Year Single Center Analysis on 355 Cases. Chirurgia (Bucur) 2020; 115(4):486–492.
31. Benjamin DA, Jaco M. 33 - Burn Nursing. In: Herndon DN, editor. Total Burn Care. Vol. 5. Elsevier; 2018. pp. 355–363.
32. Duarte FO, Hernandez SG, Machado MO, Ely JB. Tendência de internação hospitalar por queimadura em Santa Catarina no Sistema Único de Saúde, Brasil, no período entre 2008 e 2018. Rev Bras Cir Plást 2020; 35(3):322–328.
33. Ministérios da Saúde (BR) Banco de dados do Sistema Único de Saúde-DATASUS 2021.
34. American Burn Association/American College of Surgeons - Guidelines for the operation of burn centers. Gamelli RL. J Burn Care Res. 2007;28:134–141.
35. Acute carbon monoxide poisoning and delayed neurological sequelae: a potential neuroprotection bundle therapy. Oh S, Choi SC. Neural Regen Res. 2015;10:36–38. doi: 10.4103/1673-5374.150644.
36. Treatment of burns in the first 24 hours: simple and practical guide by answering 10 questions in a step-by-step form. Alharbi Z, Piatkowski A, Dembinski R, Reckort S, Grieb G, Kauczok J, Pallua N. World J Emerg Surg. 2012;7:13. doi: 10.1186/1749-7922-7-13.
37. Role of fiberoptic bronchoscopy in management of smoke inhalation lung injury. Amin M, Shaarawy H, El-Rab EG. Egypt J Chest Dis Tuberc. 2015;64:733–737.
38. Predictors of mortality and validation of burn mortality prognostic scores in a Malaysian burns intensive care unit. Lip HT, Idris MA, Imran FH, Azmah TN, Huei TJ, Thomas M. BMC Emerg Med. 2019;19:66. doi: 10.1186/s12873-019-0284-8.
39. Fluid management in major burn injuries. Haberal M, Sakallioglu Abali AE, Karakayali H.

Indian J Plast Surg. 2010;43:0–36. doi: 10.4103/0970-0358.70715.
40. Carbon monoxide poisoning. Blumenthal I. J R Soc Med. 2001;94:270–272. doi: 10.1177/014107680109400604.
41. ABC of burns: pathophysiology and types of burns. Hettiaratchy S, Dziewulski P. BMJ. 2004;328:1427–1429. doi: 10.1136/bmj.328.7453.1427.
42. Acute burn resuscitation and fluid creep: it is time for colloid rehabilitation. Atiyeh BS, Dibo SA, Ibrahim AE, Zgheib ER. Ann Burns Fire Disasters. 2012;25:59–65.
43. Treatment of burns in the first 24 hours: simple and practical guide by answering 10 questions in a step-by-step form. Alharbi Z, Piatkowski A, Dembinski R, Reckort S, Grieb G, Kauczok J, Pallua N. World J Emerg Surg. 2012;7:13.
44. Corticosteroids for the prevention and treatment of post-extubation stridor in neonates, children and adults. Khemani RG, Randolph A, Markovitz B. Cochrane Database Syst Rev. 2009:0. doi: 10.1002/14651858.CD001000.pub3.
45. The utility of bronchoscopy after inhalation injury complicated by pneumonia in burn patients: results from the National Burn Repository. Carr JA, Phillips BD, Bowling WM. J Burn Care Res. 2009;30:967–974. doi: 10.1097/BCR.0b013e3181bfb77b.
46. Nebulized heparin for inhalation injury in burn patients: a systematic review and meta-analysis. Lan X, Huang Z, Tan Z, Huang Z, Wang D, Huang Y. Burns Trauma. 2020;8:0. doi: 10.1093/burnst/tkaa015.
47. Does Ringer lactate used in Parkland formula for burn resuscitation adequately restore body electrolytes and proteins? Habib M, Saadah L, Al-Samerrae M, Shoeib F, Mamoun M, Latif G, Habib D. Modern Plastic Surg. 2017;7:1–12.
48. Nebulized heparin with N-acetylcysteine and albuterol reduces duration of mechanical ventilation in patients with inhalation injury. McGinn KA, Weigartz K, Lintner A, Scalese MJ, Kahn SA. J Pharm Pract. 2019;32:163–166. doi: 10.1177/0897190017747143.
49. Antidotal use of methemoglobin forming cyanide antagonists in concurrent carbon monoxide/cyanide intoxication. Moore SJ, Norris JC, Walsh DA, Hume AS. J Pharmacol Exp Ther. 1987;242:70–73.
50. Hospital and prehospital resources for optimal care of patients with burn injury: guidelines for development and operation of burn centers. American Burn Association. J Burn Care Rehabil. 1990;11:98–104.
51. American Burn Association. Chicago: American Burn Association; [Jul; 2022]. 2018. Advanced burn life support course: provider manual 2018 Update.
52. Clinical review: the critical care management of the burn patient. Snell JA, Loh NH, Mahambrey T, Shokrollahi K. Crit Care. 2013;17:241.
53. Cyanide intoxication as part of smoke inhalation--a review on diagnosis and treatment from the emergency perspective. Lawson-Smith P, Jansen EC, Hyldegaard O. Scand J Trauma Resusc Emerg Med. 2011;19:14. doi: 10.1186/1757-7241-19-14.
54. Lotfi M, Aghazadeh AM, Davami B, Khajehgoodari M, Karkan HA, Khalilzad MA, et al. Development of nursing care guideline for burned hand. Nurs Open. 2020;7(4):907–927. doi: 10.1002/nop2.475.
55. Norman G, Christie J, Liu Z, Westby MJ, Jefferies JM, Hudson T, et al. Antiseptics for burns. Cochrane Database Syst Rev. 2017;7(7):CD011821. doi: 10.1002/14651858.CD011821.pub2.
56. Tavares WS, Silva RS. Dressing used in the treatment of burns: an integrative review. Rev Bras Queimaduras. 2015;14(4):300–306.
57. Schneider LR, Pereira RPG, Ferraz L. A prática baseada em evidência no contexto da Atenção Primária à Saúde. Saúde Debate. 2018;42(118):594–605. doi: 10.1590/0103-1104201811804.
58. Daneshpajooh L, Ghezeljeh TN, Haghani H. Comparison of the effects of inhalation aromatherapy using Damask Rose aroma and the Benson relaxation technique in burn patients: A randomized clinical trial. Burns.

2019;45(5):1205–1214. doi: 10.1016/j.burns.2019.03.001.
59. Côrtes RM, Gomes LKS, Ferreira MBG, Silveira CF. O conhecimento da equipe de enfermagem acerca do cuidado em pacientes vítimas de queimadura. J Ciênc Biomed Saúde. 2015;1(1):40–47.
60. Rohilla L, Agnihotri M, Trehan SK, Sharma RK, Ghai S. Effect of music therapy on pain perception, anxiety, and opioid use during dressing change among patients with burns in India: a quasi-experimental, cross-over pilot study. Ostomy Wound Manage. 2018;64(10).
61. Dias LDF, Oliveira AF, Juliano Y, Ferreira LM. Unidade de Tratamento de Queimaduras da Universidade Federal de São Paulo: estudo epidemiológico. Rev Bras Cir Plást. 2015;30(1):86–92. doi: 10.5935/2177-1235.2015RBCP0121.
62. Ferreira E, Lucas R, Rossi LA, Andrade D. Curativo do paciente queimado: uma revisão de literatura. Rev Esc Enferm USP. 2003;1(37):44–51. doi: 10.1590/S0080-62342003000100006.
63. Pinho FM, Sell BT, Sell CT, Senna CVA, Martins T, Foneca ES, et al. Cuidado de enfermagem ao paciente queimado adulto: uma revisão integrativa. Rev Bras Queimaduras. 2016;16(3):181–187.
64. Henrique DM, Silva LD, Pareira SRM. Características del paciente quemado usuario de opioide y factores que contribuyen a depresión respiratoria. Enferm Glob. 2016;15(43):112–125.
65. Harats M, Haik J, Cleary M, Vashurin I, Aviv U, Kornhaber R. Retrospective Review of an Off-label Bromelain-based Selective Enzymatic Debridement (Nexobrid®) in the Treatment of Deep, Partial, and Full Thickness Burns and Hard to Heal Wounds. Isr Med Assoc J. 2020;22(2):83–88.
66. Silva LD, Henrique DM, Maia PG, Almeida ACL, Nascimento NM, Gomes PP, et al. Assistência de enfermagem ao paciente grande queimado submetido à sedação e analgesia: uma revisão de literatura. Nursing. 2018;21(236):2021–2026.
67. Rodrigues JL, Júnior, Bastos NNA, Coelho PAS. Terapia ocupacional em queimados: pesquisa bibliográfica acerca da reabilitação física junto a indivíduos com queimaduras. Rev Bras Queimaduras. 2014;13(1):11–17.
68. Schneider LR, Pereira RPG, Ferraz L. A prática baseada em evidência no contexto da Atenção Primária à Saúde. Saúde Debate. 2018;42(118):594–605. doi: 10.1590/0103-1104201811804.
69. Ferreira E, Lucas R, Rossi LA, Andrade D. Curativo do paciente queimado: uma revisão de literatura. Rev Esc Enferm USP. 2003;1(37):44–51. doi: 10.1590/S0080-62342003000100006.