

*Review Article***The role of nursing care in the management of post-burn epidermal cancer: A narrative review**Mohammad Reza Zabihi ^a  | Samira Rashtiani ^b  | Mohammad Akhoondian ^{c*}  | Ramyar Farzan ^{d*} 

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Abstract

Severe burns, affecting over 20% of the body, induce systemic dysfunction and immune suppression, correlating with increased cancer risk, especially skin cancer. Nurses play a crucial role in averting complications, which is explored in this study through a comprehensive literature review. The literature review focused on nursing care for post-burn skin cancer; a systematic search covered databases including Magiran, Scientific Information Database, and PubMed and Google Scholar search engine. Keywords "nursing", "skin cancer", and "burns" were strategically combined with Boolean operators. From an initial 580 articles, 10 met eligibility post-screening. The results have shown that optimal care for burn patients necessitates an interdisciplinary approach with the burn nurse at its core, coordinating patient care across multiple disciplines. The nurse's responsibilities encompass a comprehensive understanding of multi-system organ failure, critical care methodologies, diagnostic procedures, and psychosocial skills. Meticulous wound care, infection prevention, and pain management are pivotal, with the nurse actively engaging in nursing research. The origin of cancers within burns involves hypotheses of persistent cell proliferation, chronic inflammation, toxin exposure, and compromised immunological defense. Nursing care, particularly in detecting and treating wound inflammation, is pivotal in preventing cancer. Nurses contribute to patient education on skin cancer prevention, emphasizing lifestyle choices and providing crucial psychological support. Nursing diagnoses, based on symptomatology studies, include "risk for impaired skin integrity", "impaired skin integrity", "acute pain", "chronic pain", and "impaired comfort". These diagnoses guide tailored interventions to prevent skin cancer incidence. In sum, nurses are pivotal in comprehensive burn care, overseeing wound care, infection prevention, and patient education on UV radiation dangers. They advocate healthy lifestyles to reduce skin cancer risk, provide psychological support, and encourage commitment to prevention practices. Nursing diagnoses guide tailored interventions, contributing to ongoing improvements in burn care and enhancing the quality of life for survivors.

Keywords: Burns, Cancer, Nursing Care, Nursing, Nurses.**1 | Introduction**

Burn injuries are a global health concern, resulting in approximately 180,000 fatalities annually [1-13]. Burns can be defined as damage to the skin or any organic tissue that is mainly caused by fire, electricity, radioactive, radiation, and chemical substances [14-30]. Burn injuries can have profound and enduring

implications, manifesting not only in physical ramifications [31-46] but also significantly impacting the mental health and overall quality of life of affected individuals [47-55]. This burden extends beyond patients themselves, affecting their families and placing substantial strain on healthcare systems globally [56-77]. Notably, burns rank as the fourth most prevalent type of accident,

afflicting approximately 11 million individuals worldwide and resulting in 300,000 annual fatalities [78].

Severe burn injuries are characterized by burns affecting more than 20% of adults' total body surface area [79]. These injuries present heightened challenges compared to other traumas due to the extensive and persistent systemic dysfunction they elicit [80]. While common burns primarily inflict damage on the skin, extensive burns manifest profound systemic effects. Furthermore, burns disrupt the delicate equilibrium of the immune system, leading to the suppression of both humoral and cellular immunity. The extent and degree of the burns directly dictate the magnitude of this immune disturbance. In addition, to the immediate consequences, burns are intricately linked to long-term catabolism and hypermetabolism [42]. This metabolic disturbance triggers the proliferation of somatic and non-lymphatic cells, consequently escalating the potential for the incidence of cancer [81]. Significantly, cytokines induced by burns, such as TGF- β , play a role in the immunosuppression process and may be intricately associated with the development of malignancies [82].

Skin cancer is the predominant form of cancer in the United States, and the majority of cases are nonmelanomatous. Malignant nonmelanoma skin cancers originate from keratinized epithelial cells, encompassing basal cell carcinoma and squamous cell carcinoma. Although melanoma constitutes only about 2% of malignant skin cancers, it is responsible for the majority of fatalities. In 2010, over 2 million cases of skin cancer were diagnosed in the United States. Basal cell carcinoma is the most prevalent type, characterized by a slow growth rate and local invasiveness. Squamous cell carcinoma, the second most common form of nonmelanomatous skin cancer, accounts for approximately 20% to 30% of cases [83].

Like all facets of health and healthcare, nursing care is pivotal in averting complications arising from burns [84]. In this context, the present study endeavors to scrutinize nurses' role in mitigating skin cancer after burns, employing a comprehensive literature review.

2 | Methods

The present literature review, undertaken in 2023, delves explicitly into the determinants influencing nursing care during post-burn skin cancer. A systematic search covered databases including Magiran, Scientific Information Database, and PubMed and Google Scholar search engine. The search strategy entailed a meticulous amalgamation of keywords such as "nursing", "skin cancer", and "burns", complemented by the strategic application of Boolean operators "OR" and "AND" within the titles and

abstracts. Concurrently, manual searches were assiduously conducted in associated journals, and the reference lists of selected papers were scrupulously examined for thorough coverage. Inclusion criteria for the chosen studies spanned the timeframe between January 2000 and February 2023, ensuring their relevance to nurse care and accessibility in either Persian or English with full-text availability. Conversely, exclusion criteria were applied to conference presentations, educational articles, publications in non-reputable journals, and letters to the editor. Initially, 580 articles underwent a stringent screening process, culminating in identifying ten pieces that met the predefined eligibility criteria after excluding duplicates and irrelevant studies. The data extraction process employed a comprehensive checklist encompassing details on the timeframe, study type, and outcomes. Elimination of duplicate studies was carried out meticulously, and a trio of seasoned researchers systematically evaluated the chosen articles for quality and potential biases. The practical organization and identification of duplicates were facilitated by utilizing the Endnote version 20 reference management software.

3 | Results

3.1 | Burn wound management and cancer prevention

The provision of optimal care for burn patients necessitates a distinctly interdisciplinary approach. The achievement of favorable patient outcomes relies significantly on the composition of the burn care team and the seamless collaboration among its members. Positioned at the core of this team is the burn nurse, functioning as the coordinator of all patient care activities. Additionally, given the intricate and multisystemic nature of burn patient involvement, the burn nurse must possess a comprehensive understanding of multisystem organ failure, critical care methodologies, diagnostic procedures, and rehabilitative and psychosocial skills. Further, the nurse assumes a pivotal role in overseeing the patient's holistic care, harmonizing activities with other disciplines, including occupational and physical therapy, social services, nutritional services, and pharmacy. Concurrently, the burn nurse serves as an adept in wound care. Throughout the various stages of burn wound healing, whether spontaneous or through excision and grafting, the nurse is tasked with meticulous wound care and vigilant observation for subtle changes requiring immediate attention.

Additionally, the nurse plays a crucial role in infection prevention and pain management. Moreover, the scope of the nurse's responsibilities continues to evolve, with nurses actively engaging in nursing research and contributing to the evidence-based practice of burn care. Practice guidelines, critical pathways, and

nursing care plans serve as instrumental tools that aid in delineating and refining the nurse's role in the comprehensive spectrum of burn care [85]. On the other hand, based on former evidence, the origin of cancers manifesting within burns is not entirely comprehended. However, prevailing hypotheses suggest persistent cell proliferation due to chronic inflammation and tissue irritation, prolonged exposure of tissues to toxins and co-carcinogens after the injury, and deficient vascularization of burned tissue, resulting in compromised immunological defense [86]. In this regard, Gethin (2012) revealed that nursing care must have a pivotal role in cancer prevention through the detection and treatment of wound inflammation and infection [87]. Sibbald *et al.*, (2007) have also shown that nurses can mitigate inflammation and facilitate wound healing by adopting innovative treatment modalities, including nanocrystals [88]. Also, Hoyt *et al.*, (2011) have demonstrated that nurses can prevent scar formation during wound healing [89] and reduce the risk of skin cancer incidence.

3.2 | Patient education

Nurses can be highly impactful in educating patients to prevent skin cancer following burns. For instance, Mahon (2003) has highlighted those nurses, in general, can provide patients with necessary alerts regarding exposure to ultraviolet radiation [90]. Further, Rakhshani *et al.*, (2022) have pointed out that nurses can inform patients about changes in burn wounds by providing self-care education. This encourages patients at risk to promptly report any changes in their burn wounds to their healthcare provider [91]. Additionally, nurses can play a crucial role in helping burn patients adopt a healthy lifestyle that can reduce their risk of skin cancer. This involves promoting a well-balanced diet rich in antioxidants, encouraging regular exercise, and supporting smoking cessation. Healthy lifestyle choices can contribute to overall well-being and help the body's natural ability to heal and resist disease [92]. Finally, coping with the aftermath of burns can be extremely challenging and emotionally taxing for patients. Nurses can play a vital role in providing psychological support by addressing patients' concerns, offering effective coping strategies, and fostering a positive mindset. Stress reduction techniques such as counseling and support groups can significantly contribute to the overall mental well-being of the patients. This, in turn, can indirectly impact the patient's commitment to skin cancer prevention practices [93].

3.3 | Nursing Diagnosis

The nurse is pivotal in facilitating patient assistance and guidance toward early diagnosis while navigating the intricate phases of disease, treatment, and rehabilitation. Nevertheless, providing

comprehensive care and education for patients and their families poses a formidable challenge for the nursing profession. There is an inherent necessity for nursing not only to contribute to early diagnosis but also to participate actively in the therapeutic process. This imperative condition is vital for elucidating and addressing the complexities involved in caring for cancer patients, particularly those grappling with skin cancer, with the overarching goal of enhancing their quality of life through tailored interventions for each unique case. In this context, nursing diagnoses are pivotal in preventing skin cancer incidence [94-97].

Numerous studies have scrutinized the symptomatology of skin cancer through a nursing lens. Drawing from previous evidence, predominant signs, and symptoms revolved around the emergence of nodules and asymmetric speckles with color changes, yet lacking skin disruption—these intricacies align with the nursing diagnosis of "risk for impaired skin integrity". Moreover, a noteworthy prevalence of signs and symptoms associated with ulcers, sores, and blisters was identified, correlating with the issue of "impaired skin integrity". Additional clinical manifestations, including pain, itching, night sweats, and swollen ganglia, were observed, each linked to distinct nursing diagnoses such as "acute pain", "chronic pain", and "impaired comfort" [98].

4 | Limitations

The current study is a literature review focusing on the role of nurses in preventing post-burn skin cancer. Inevitably, it has some limitations. Firstly, being an analytical study, it didn't systematically review the literature. Secondly, it predicts the indirect effects of several variables on each other, possibly yielding results contrary to reality. Thirdly, it only considered articles post-2000, potentially missing crucial data. Fourthly, this study lacks a risk of bias assessment.

5 | Implications for nursing clinical practice

The implications of the findings for nursing clinical practice highlight the importance of a comprehensive and interdisciplinary approach to burn care and skin cancer prevention. Nurses should prioritize robust collaboration with various healthcare disciplines to ensure effective communication and coordination in patient care. Their training programs should equip them with diverse skills, covering multisystem organ failure, critical care methodologies, diagnostics, rehabilitation, and psychosocial skills. Active engagement in patient education is crucial, and nurses play a central role in imparting information on ultraviolet radiation exposure, promoting healthy lifestyles, and emphasizing early detection. Psychological support is critical in recognizing the

emotional challenges faced by burn survivors. Evidence-based practices should seamlessly integrate into nursing care, utilizing guidelines, critical pathways, and care plans. Tailoring interventions based on nursing diagnoses related to impaired skin integrity, pain, and discomfort ensures personalized and targeted care. Continuous professional development is essential for nurses to stay abreast of advancements in wound care, infection prevention, pain management, and skin cancer prevention. These implications underscore nurses' dynamic and evolving role in enhancing the quality of care and outcomes for burn patients.

6 | Recommendations for future research

Future research in burn care and skin cancer prevention must focus on longitudinal studies to determine the long-term incidence of skin cancer in burn survivors. Factors such as burn severity, treatment modalities, and preventive measures over extended periods should be considered. It's also necessary to explore the effectiveness of nurse-led educational interventions in promoting skin cancer prevention practices among burn patients and assess the long-term impact of these initiatives on patient adherence. Investigating the psychosocial impact of burn scars on mental health and quality of life, along with the role of nursing interventions in addressing these challenges, could provide valuable insights. Innovative approaches in wound care, including advanced technologies or novel therapeutic modalities, should be explored to reduce inflammation and minimize the risk of skin cancer. Moreover, research should examine technology integration, such as telemedicine, in skin cancer surveillance for timely detection. Assessing nursing's role in post-burn rehabilitation and the impact of community-based programs on skin cancer prevention, along with exploring the economic burden of skin cancer in burn survivors, will contribute to a comprehensive understanding of this complex healthcare challenge. Lastly, investigating patient-reported outcomes in skin cancer survivorship and evaluating the implementation of nursing guidelines in burn centers will enhance our ability to tailor interventions and improve long-term patient outcomes.

7 | Conclusions

Nurses play a crucial role in providing comprehensive care for burn patients. They act as coordinators of patient care activities, managing wound care, infection prevention, pain control, and patient education. Furthermore, patient education includes educating individuals on the dangers of exposure to ultraviolet radiation and encouraging prompt reporting of changes in burn wounds. Burn nurses also advocate for healthy lifestyles to reduce the risk

of skin cancer. Psychological support is crucial to address the emotional challenges faced by burn survivors and indirectly contribute to their commitment to skin cancer prevention practices. In addition, nursing diagnoses have been used to analyze skin cancer symptomatology, identifying signs related to impaired skin integrity, pain, and discomfort. These diagnoses are essential tools for creating tailored interventions that enhance care for individuals affected by skin cancer after burns. Overall, the multifaceted role of burn nurses contributes significantly to ongoing improvements in burn care, ultimately improving the quality of life for burn survivors.

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Authors' contributions

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work: MRZ, SR, MA, RF; Drafting the work or revising it critically for important intellectual content: MRZ, SR, MA, RF; Final approval of the version to be published: MRZ, SR, MA, RF; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved: MRZ, SR, MA, RF.

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We do not have potential conflicts of interest with respect to the research, authorship, and publication of this article.

Availability of data and materials

The datasets used during the current study are available from the corresponding author on request.

Using artificial intelligent chatbots

None.

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