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The role of nursing, pharmacology, and diagnostics in pain management: Review

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***Abstract*---**Background: Severe burns affecting more than 20% of the body can lead to systemic dysfunction and immunological suppression, increasing the risk of developing skin cancer. This backdrop underscores the critical role of nursing in preventing complications associated with burn injuries, including cancer development. Aim of Work: This research aims to examine the role of nursing care in the prevention and management of post-burn skin cancer, highlighting the importance of a multidisciplinary approach to delivering optimal care for burn patients. Methods: An extensive literature review was conducted across multiple databases, including Magiran, Scientific Information Database, PubMed, and Google Scholar. The search utilized targeted keywords—"nursing," "skin cancer," and "burns"—in combination with Boolean operators, resulting in an initial pool of 580 articles. After a thorough screening process, 10 articles were identified as eligible for analysis. Results: The findings indicate that effective nursing care is essential in managing wound care, controlling infections, and alleviating pain while emphasizing the role of nurses in early detection and treatment of wound inflammation, crucial for cancer prevention. Nurses are responsible for educating patients about skin cancer prevention, emphasizing healthy lifestyle choices and providing psychological support. Five key nursing diagnoses identified from the analysis include "risk for impaired skin integrity," "impaired skin integrity," "acute pain," "chronic pain," and "impaired comfort," which guide personalized treatment strategies aimed at minimizing cancer risk. Conclusion: Nurses are pivotal in delivering comprehensive care for burn patients, which includes managing wound healing, preventing infections, and providing education on UV radiation hazards. Their contributions not only enhance patient outcomes but also improve the quality of life for burn survivors through tailored interventions and preventive care strategies.

Keywords---Burns, Review, Skin Cancer, Nursing Care, Diagnosis, Treatment, Patient Education, Wound Management.

Introduction

Burn injuries are a significant worldwide health issue, causing almost 180,000 deaths each year [1-7]. Burns are described as injuries to the skin or other organic tissue, mostly produced by fire, electricity, radioactive radiation, and chemical compounds [8-10]. Burn injuries may have severe and long-lasting effects, not only causing physical consequences, but also greatly influencing the emotional well-being and general quality of life of those afflicted [11-17]. The impact of this responsibility goes beyond only the patients themselves, as it also affects their families and puts significant pressure on healthcare systems worldwide [18-23]. It is worth mentioning that burns are the fourth most common form of mishap, affecting almost 11 million people globally and causing 300,000 deaths each year [24].

Severe burn injuries are defined as burns that impact over 20% of the total body surface area in adults [25]. These injuries pose more difficulties compared to other traumas because they cause widespread and long-lasting malfunction in the body [26]. Although simple burns mostly cause harm to the epidermis, severe burns have significant systemic consequences. In addition, burns disturb the delicate balance of the immune system, resulting in the reduction of both humoral and cellular immunity. The severity and extent of the burns directly determine the size of this immunological disruption. Furthermore, burns are closely associated with long-term catabolism and hypermetabolism, in addition to their immediate repercussions. This metabolic imbalance leads to the rapid growth of cells in the body, even those that are not part of the lymphatic system. As a result, the risk of developing cancer increases [27,28]. Cytokines, namely TGF-β, that are caused by burns, have a significant impact on the process of immunosuppression and may be closely linked to the development of malignancies [29].

Nonmelanomatous skin cancer is the most common kind of cancer in the United States. Malignant nonmelanoma skin malignancies arise from keratinized epithelial cells, namely basal cell carcinoma and squamous cell carcinoma. Despite accounting for just around 2% of all malignant skin tumors, melanoma is responsible for the majority of deaths. More than 2 million instances of skin cancer were identified in the United States in 2010. Basal cell carcinoma is the most common kind, distinguished by its moderate growth rate and tendency to invade nearby tissues. Squamous cell carcinoma, the second most prevalent kind of nonmelanomatous skin cancer, comprises about 20% to 30% of cases [30].

Aim of Work

Nursing care plays a crucial role in preventing problems that may arise from burns, much as other aspects of health and healthcare. The current research aims to examine the role of nurses in reducing the occurrence of skin cancer after burns, using a thorough evaluation of existing literature [31].

Methodology

The current literature study, conducted in 2023, specifically examines the factors that affect nursing care in patients with post-burn skin cancer. A comprehensive search was conducted across many databases, including Magiran, Scientific Information Database, PubMed, and Google Scholar search engine. The search method used a careful combination of keywords such as "nursing", "skin cancer", and "burns", along with the deliberate use of Boolean operators "OR" and "AND" in the titles and abstracts. Simultaneously, diligent manual searches were done in related journals, and the reference lists of chosen articles were meticulously inspected to ensure comprehensive coverage. The inclusion criteria for the selected studies included the period from 2000 to 2022, guaranteeing their pertinence to nursing care and availability in either Persian or English with complete text access.

In contrast, the researchers used exclusion criteria to filter out conference presentations, instructional pieces, publishing in non-reputable journals, and letters to the editor. At first, 580 papers were carefully evaluated, resulting in the identification of 10 publications that satisfied the specific eligibility requirements. This was done by removing duplicate articles and research that were not relevant. The data extraction technique included a thorough checklist that included information on the duration, kind of research, and results. The process of removing duplicate studies was conducted with great care, and a group of experienced researchers methodically assessed the selected publications for their quality and any possible biases. The efficient arrangement and recognition of duplicates were enhanced by using the Endnote version 20 reference management software.

Management of burn wounds and prevention of cancer

Providing the best possible treatment for burn victims requires a well-defined multidisciplinary strategy. The attainment of positive patient outcomes is heavily dependent on the makeup of the burn care team and the smooth coordination among its members. At the center of this team is the burn nurse, who serves as the coordinator for all patient care tasks. In addition, because to the complex and multi-faceted nature of caring for burn patients, the burn nurse has to have a thorough awareness of multiple organ failure, critical care techniques, diagnostic procedures, as well as rehabilitative and psychosocial abilities. In addition, the nurse plays a crucial role in supervising the comprehensive care of the patient, coordinating activities with other fields such as occupational and physical therapy, social services, dietary services, and pharmacy. Simultaneously, the burn nurse excels in the field of wound care. During the several phases of burn wound healing, whether it occurs naturally or by surgical removal and grafting, the nurse has the responsibility of providing careful wound care and closely monitoring for any little changes that may need quick treatment.

In addition, the nurse fulfills a vital function in the prevention of infections and the treatment of pain. In addition, the nurse's range of duties is always changing, as nurses actively participate in nursing research and contribute to the evidence-

based practice of burn care. Practice standards, key pathways, and nursing care plans are essential tools that help define and improve the nurse's role in providing comprehensive burn care [32]. However, the exact cause of malignancies that develop inside burns is not fully understood, despite previous research. Nonetheless, current theories propose that continuous cell growth occurs as a consequence of long-lasting inflammation and irritation of tissues, extended exposure to harmful substances and substances that promote cancer development after the damage, and inadequate blood supply to burnt tissue, leading to weakened immune response [34]. Gethin [35] emphasized that nursing care plays a crucial role in cancer prevention by identifying and treating wound inflammation and infection. Sibbald et al. [36] shown that nurses may effectively reduce inflammation and promote wound healing by using advanced treatment methods, such as the use of nanocrystals. In addition, Hoyt et al. [37] have shown that nurses have the ability to inhibit the production of scars during the process of wound healing, as well as decrease the likelihood of developing skin cancer.

Patient education

Nurses has the potential to have a significant influence in instructing patients on how to avoid skin cancer after experiencing burns. Mahon [38] has emphasized that nurses have the ability to inform patients about the potential risks of UV radiation exposure. In addition, Rakhshani et al. [39] have highlighted that nurses have the ability to educate patients on self-care, enabling them to stay informed about any developments in their burn wounds. Patients who are at risk are encouraged to rapidly inform their healthcare practitioner of any changes in their burn wounds. In addition, nurses may have a pivotal role in assisting burn victims in adopting a healthful lifestyle that can diminish their susceptibility to skin cancer. This entails advocating for a nutritionally balanced diet that is abundant in antioxidants, promoting consistent physical activity, and providing assistance for those who want to quit smoking. Adopting a healthy lifestyle may enhance general well-being and bolster the body's innate capacity to heal and defend against illnesses [40]. Dealing with the consequences of burns may be very difficult and emotionally draining for people. Nurses may significantly contribute to providing psychological support by addressing patients' problems, giving efficacious coping skills, and cultivating a positive outlook. Counseling and support groups are effective stress reduction treatments that may greatly enhance the overall mental well-being of patients. Consequently, this might indirectly influence the patient's dedication to practicing skin cancer preventive measures [41].

Nursing Diagnosis

The nurse plays a crucial role in helping patients get support and direction for early diagnosis, as well as guiding them through the complex stages of illness, treatment, and rehabilitation. However, the nursing profession has a difficult task in delivering thorough care and education to patients and their families. Nursing has a fundamental need to not only aid in early diagnosis but also actively engage in the treatment process. This essential need is crucial for clarifying and dealing with the intricacies associated with the care of cancer patients, including those

struggling with skin cancer, with the ultimate aim of improving their quality of life via customized treatments for each individual instance. Nursing diagnosis have a crucial role in avoiding the development of skin cancer in this particular situation [42-45].

Much research have examined the symptoms of skin cancer from a nursing perspective. Based on prior data, the main signs and symptoms seen were the appearance of nodules and uneven spots with changes in color, but without any damage to the skin. These details are consistent with the nursing diagnosis of "risk for impaired skin integrity". Furthermore, a significant occurrence of indications and manifestations linked to ulcers, sores, and blisters was seen, which is closely related to the problem of "compromised skin integrity". Other clinical symptoms, such as discomfort, itching, excessive sweating at night, and enlarged lymph nodes, were noted. Each symptom was associated with specific nursing diagnoses, such as "acute pain," "chronic pain," and "impaired comfort" [46].

Constraints

This research is a literature review that specifically examines the function of nurses in the prevention of post-burn skin cancer. Undoubtedly, it has some constraints. Firstly, as analytical research, it lacked a thorough literature review. Additionally, it forecasts the indirect impacts of several factors on one another, perhaps producing outcomes that are contradictory to actuality. Furthermore, it just considered publications published after the year 2000, which might have resulted in the omission of significant data. Furthermore, this research does not include an evaluation of potential biases.

Implications for nursing and laboratory clinical practice

The results have important implications for nursing clinical practice, emphasizing the need of a thorough and multidisciplinary approach to burn treatment and prevention of skin cancer. Nurses must emphasize strong cooperation with other healthcare professions to guarantee efficient communication and coordination in patient care. Their training programs should provide them with a wide range of abilities, including knowledge in multisystem organ failure, critical care techniques, diagnostics, rehabilitation, and psychosocial skills. Nurses have a vital role in actively educating patients about UV radiation exposure, supporting healthy lifestyles, and highlighting the need of early identification. Psychological assistance is crucial in identifying the emotional difficulties experienced by those who have suffered burns. Nursing care should include evidence-based methods by effectively incorporating guidelines, essential pathways, and care plans. Customizing treatments based on nursing diagnoses associated with compromised skin condition, pain, and discomfort guarantees individualized and focused care. Continuous professional development is crucial for nurses to remain up-to-date with improvements in wound care, infection prevention, pain management, and skin cancer prevention. The implications emphasize the nurses' ever-changing and developing role in improving the quality of treatment and results for burn victims.

Suggestions for further research

Future research in burn treatment and skin cancer prevention should prioritize doing longitudinal studies to ascertain the long-term occurrence of skin cancer in individuals who have had burns. It is important to take into account factors such as the intensity of burns, the methods of treatment, and precautions taken to avoid burns over long periods of time. It is important to investigate the efficacy of nurse-led educational interventions in encouraging burn patients to adopt skin cancer preventive behaviors. Additionally, it is crucial to evaluate the lasting effects of these efforts on patient compliance. Examining the psychosocial consequences of burn scars on mental well-being and overall quality of life, as well as the effectiveness of nursing treatments in tackling these difficulties, might provide significant knowledge.

Exploring innovative ways in wound care, such as advanced technology or new treatment modalities, may help decrease inflammation and lower the risk of skin cancer. Furthermore, it is essential for research to investigate the use of technology, such as telemedicine, in the monitoring of skin cancer to ensure prompt identification. Evaluating the involvement of nursing in post-burn rehabilitation and the influence of community-based initiatives on preventing skin cancer, as well as investigating the financial burden of skin cancer in burn survivors, would enhance our full comprehension of this intricate healthcare issue. Finally, doing research on patient-reported outcomes in the context of skin cancer survival and assessing the adoption of nursing recommendations in burn centers would strengthen our capacity to customize therapies and boost long-term patient outcomes.

Conclusion

Nurses have a vital role in delivering comprehensive treatment to individuals with burn injuries. They serve as coordinators of patient care activities, including wound care, infection prevention, pain management, and patient education. Moreover, patient education encompasses instructing persons about the hazards of UV radiation exposure and promoting immediate reporting of any alterations in burn wounds. In addition to their primary duties, burn nurses also promote healthy lives as a means of mitigating the likelihood of developing skin cancer. Psychological assistance is essential for addressing the emotional difficulties experienced by burn survivors and indirectly promoting their dedication to practicing skin cancer prevention. Furthermore, nursing diagnoses have been used to examine the symptomatology of skin cancer, including finding indicators associated with compromised skin integrity, pain, and discomfort. These diagnoses are crucial instruments for developing customized therapies that improve care for persons impacted by skin cancer after burns. In general, the many responsibilities of burn nurses provide a substantial contribution to the continuous enhancements in burn care, eventually leading to an improvement in the overall well-being of burn survivors.

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