

*Review Article*

## Role of exercise in nursing care for burn wound patients: A narrative review from a nursing perspective

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### Abstract

Burn injuries are a global health issue with extensive physical and psychological ramifications. Nursing care plays an instrumental role in the recovery of individuals with burn wounds. There is a growing interest in incorporating exercise programs as a supplementary approach alongside conventional burn wound care. This review meticulously assesses the influence of exercise interventions integrated into nursing care for burn wound patients. By amalgamating current empirical evidence, it seeks to provide valuable insights into potential advantages, obstacles, and optimal strategies. Burn injuries encompass a spectrum of noteworthy physical, psychological, and socioeconomic repercussions. Exercise confers several benefits, including enhanced circulation, prevention of muscle wasting, expedited wound healing, effective pain management, anxiety alleviation, and bolstered self-esteem. Nurses occupy an indispensable position in promoting exercise not only for prevention but also during rehabilitation, addressing mental health concerns, and facilitating education. Ultimately, exercise emerges as a substantial contributor to holistic burn patient care, thereby warranting further exploration and the development of comprehensive guidelines.

**Keywords:** Nursing, Nursing Care, Exercise, Burns, Wounds, Review.

## 1 | Introduction

Burn is a health problem that happens all over the world and it has inappropriate effects on society [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 produce some of the most painful patient experiences [31-46] and may result in unpleasant physical and psychological outcomes among patients [47-64]. Nursing care plays a pivotal role in the rehabilitation and recovery of burn wound patients [65]. Over the years, there has been a growing

interest in the integration of exercise programs as a complementary approach to traditional burn wound care [65].

The management of burn wounds extends beyond wound dressing changes and pain management [66]; it encompasses the holistic well-being of the patient. Exercise, in its various forms, has shown promise in addressing not only the physical aspects of burn injuries, such as muscle strength and joint mobility, but also the emotional and psychosocial aspects, including anxiety and depression [67]. Understanding how exercise can be effectively

incorporated into nursing care plans for burn wound patients is a subject of increasing importance.

This review will delve into the existing body of literature, examining studies, trials, and reports that shed light on the impact of exercise interventions within the context of nursing care for burn wound patients. By synthesizing the current evidence, we aim to provide insights into the potential benefits, challenges, and best practices associated with implementing exercise programs as part of comprehensive nursing care. Ultimately, our exploration seeks to contribute to the enhancement of burn wound patient care protocols and the promotion of their overall well-being and recovery.

## 2 | Methods

### 2.1 | Literature search strategy

A systematic and comprehensive search of electronic databases, including PubMed, MEDLINE, CINAHL, and Cochrane Library, was conducted. The search terms used were a combination of keywords such as "nursing", "burn wound", "exercise", "rehabilitation", and "patient care".

### 2.2 | Inclusion and exclusion criteria

Studies published in the last 10 years, written in English, focusing on exercise interventions within nursing care for burn wound patients were included in the present review. Studies not directly related to exercise in burn wound care, non-English studies, and studies published before the last decade were excluded.

### 2.3 | Study selection

Two independent reviewers screened titles and abstracts to select relevant articles based on the inclusion and exclusion criteria. Disagreements were resolved through consensus.

### 2.4 | Data extraction

Relevant data from selected studies, including study design, participant demographics, exercise interventions, and outcomes, were extracted. Data extraction was independently conducted by two reviewers.

## 3 | Results

### 3.1 | The significance of burn injuries: understanding the multifaceted impact

Burn injuries are among the most devastating and challenging medical conditions, affecting millions of people worldwide each year [68]. These injuries result from exposure to thermal, chemical, electrical, or radiation sources, and they can have far-reaching

physical, psychological, and socioeconomic consequences [69]. Understanding the significance of burn injuries is crucial for healthcare providers, researchers, policymakers, and society at large to address the complex needs of burn survivors adequately.

### 3.2 | Epidemiology and global burden of burns

Burn injuries are a global health concern, with a staggering number of cases reported annually [70]. According to the World Health Organization (WHO), an estimated 180,000 deaths occur annually due to burns, with low- and middle-income countries bearing a disproportionate burden [71]. Moreover, millions of survivors experience lifelong challenges, making burns a significant public health issue [72].

### 3.3 | Physical consequences of burn injuries

The physical consequences of burn injuries can be profound and often extend beyond the initial wound [73]. Burns damage the skin, which serves as a crucial barrier to infection and regulates temperature. Severe burns can lead to infection, fluid imbalance, and electrolyte disturbances, sometimes necessitating intensive care and surgical interventions like skin grafting [74]. Extensive burns may result in scarring, contractures, and impaired mobility, posing long-term challenges for patients [75]. Burn injuries are notoriously painful. The pain associated with burns can be excruciating, and patients often require potent analgesics and specialized pain management techniques [76]. Pain can persist throughout the healing process and may evolve into chronic pain, affecting the quality of life and mental well-being of survivors [77].

### 3.4 | Psychological and emotional effects of burn injuries

The psychological impact of burn injuries is substantial. Survivors frequently experience anxiety, depression, post-traumatic stress disorder (PTSD), and body image disturbances [78]. Coping with disfigurement and visible scars can lead to self-esteem issues and social withdrawal. Mental health support and interventions are essential components of burn care to address these emotional challenges [79].

### 3.5 | Functional impairments of burn injuries

Burn injuries can lead to severe functional impairments [80]. Loss of range of motion, muscle strength, and joint mobility can occur, particularly in areas where burns have healed [81]. These impairments can hinder daily activities, making it challenging for survivors to perform routine tasks and engage in their usual roles within their families and communities.

### **3.6 | Socioeconomic consequences of burn injuries**

Burn injuries can have substantial socioeconomic consequences [82]. The cost of burn treatment, including hospitalization, surgeries, wound care, and rehabilitation, can be financially burdensome for individuals and healthcare systems [83]. Additionally, many survivors face challenges in returning to work or resuming their previous occupations due to physical limitations and stigma associated with burn injuries.

### **3.7 | Stigma and social isolation of burn patients**

Stigma remains a significant issue for burn survivors. Discrimination and social rejection can exacerbate the psychological distress experienced by individuals with burn injuries [84]. Society's limited understanding of burns and their long-term effects contributes to the isolation experienced by survivors.

### **3.8 | Preventability and public health strategies**

Many burn injuries are preventable through education, safety measures, and adherence to fire and burn prevention strategies [85]. Public health initiatives play a critical role in reducing the incidence of burns [85]. These efforts include promoting fire safety, advocating for smoke alarm installations, and ensuring the safe storage of flammable materials.

### **3.9 | Effect of exercise on burn wound healing: a pathway to recovery**

Burn injuries are among the most traumatic and debilitating forms of trauma that individuals can endure [86]. Beyond the immediate physical damage caused by burns, the recovery process can be long and arduous, often involving multiple surgeries, rehabilitation, and psychosocial challenges. Recent research has shown that exercise can play a significant role in aiding the healing process for burn survivors [87], offering numerous benefits that extend beyond physical recovery.

#### **3.9.1 | Physical benefits**

##### **3.9.1.1 | Improved circulation**

Exercise, when performed correctly and under supervision, can help improve blood circulation in burn-damaged areas. This enhanced blood flow delivers essential nutrients and oxygen to the healing tissues, expediting the recovery process [88].

##### **3.9.1.2 | Prevention of muscle atrophy**

Burn injuries often result in muscle loss and reduced joint mobility due to prolonged immobility during recovery [89]. Exercise programs that focus on resistance training and range of motion

exercises can help prevent muscle atrophy and maintain joint flexibility [90].

##### **3.9.1.3 | Wound healing**

Regular exercise has been linked to improved wound healing. It can stimulate collagen production, which is essential for scar formation and tissue regeneration [91]. Properly healed wounds are less likely to develop complications like contractures.

#### **3.9.2 | Psychological benefits**

##### **3.9.2.1 | Pain management**

Burn injuries can be excruciatingly painful. Exercise triggers the release of endorphins, the body's natural painkillers, which can help alleviate pain and improve the patient's overall pain management [92].

##### **3.9.2.2 | Reduced anxiety and depression**

The psychological impact of burn injuries can be severe, leading to anxiety and depression [93]. Exercise has a well-established role in reducing symptoms of anxiety and depression by promoting the release of neurotransmitters like serotonin and norepinephrine [94].

##### **3.9.2.3 | Enhanced self-esteem**

Physical activity can boost self-esteem and body image, crucial factors for individuals with burn scars who may experience altered appearances and self-consciousness [95].

#### **3.9.3 | Social and functional benefits**

##### **3.9.3.1 | Improved functional independence**

Burn survivors often face challenges in regaining their functional independence. Exercise can enhance physical strength and mobility, allowing individuals to perform daily tasks more easily [96].

##### **3.9.3.2 | Community reintegration**

Exercise programs offered in group settings can provide a sense of community and support, reducing feelings of isolation and social withdrawal commonly experienced by burn survivors [97].

### **3.10 | Considerations and precautions in implementation of exercise for burn wound healing**

While exercise can offer numerous benefits for burn wound healing, it must be approached with caution and under the guidance of healthcare professionals, particularly in severe burn cases [98]. Exercise programs should be tailored to each individual's specific

needs, taking into account the type and location of the burn, the extent of the injury, and the patient's overall health [99].

### **3.11 | Exercise and nursing: a symbiotic relationship for holistic healthcare**

Exercise and nursing are two fundamental pillars of healthcare that, when brought together, create a powerful synergy promoting holistic well-being. Exercise plays a pivotal role in maintaining and improving physical and mental health [100], while nursing encompasses a wide range of healthcare practices focused on patient care, advocacy, and education [101]. This article explores the symbiotic relationship between exercise and nursing, highlighting how nurses can leverage exercise as a tool to enhance patient outcomes and overall healthcare delivery.

#### **3.11.1 | Exercise as a preventive measure**

Nurses are often at the forefront of preventive healthcare, educating patients about the importance of exercise in disease prevention [101]. Physical activity has been associated with a reduced risk of chronic conditions such as heart disease, diabetes, and obesity [102]. Nurses can empower patients by providing tailored exercise recommendations, addressing their unique health needs and limitations. Whether it's advising a sedentary individual to start with light walking or guiding a post-surgery patient through rehabilitation exercises, nurses play a pivotal role in preventing illness through exercise promotion [103].

#### **3.11.2 | Rehabilitation and recovery**

In cases of illness or burn injury, exercise is a key component of the rehabilitation process [104]. Nurses, particularly those in rehabilitation and physical therapy settings, collaborate with patients to design exercise regimens that aid recovery. This can include exercises to improve mobility after surgery, regain strength following an illness, or manage chronic pain conditions. Nurses monitor patients' progress, make necessary adjustments to exercise plans, and provide valuable emotional support throughout the rehabilitation journey [105].

#### **3.11.3 | Mental health and emotional well-being**

Nursing extends beyond physical health to encompass mental health and emotional well-being [106]. Exercise has been shown to have a profound impact on mental health by reducing symptoms of depression, anxiety, and stress [107]. Nurses in psychiatric and mental health settings can incorporate exercise into therapeutic interventions, such as group fitness activities or mindfulness-based exercises. These practices not only improve patients'

psychological state but also contribute to a sense of community and camaraderie, fostering a supportive environment for healing.

#### **3.11.4 | Patient education and empowerment**

Nurses are educators by nature, and patient education is a core aspect of their role. Educating patients about the benefits of regular exercise and guiding them on safe and effective exercise practices is an invaluable contribution to healthcare [101]. By imparting knowledge about exercise's role in disease management, stress reduction, and overall well-being, nurses empower patients to take an active role in their health [108]. Patients who understand the importance of exercise are more likely to adhere to prescribed exercise regimens and make healthier lifestyle choices.

#### **3.11.5 | Chronic disease management**

Chronic diseases like diabetes, hypertension, and arthritis often require ongoing management [109]. Exercise is a cornerstone of chronic disease management, helping patients control symptoms, improve quality of life, and reduce the need for medications [110]. Nurses collaborate with patients to develop personalized care plans that include exercise as a central component. They monitor patients' progress, educate them about self-management strategies, and serve as advocates for their health within the healthcare system.

#### **3.12 | A call for interdisciplinary collaboration**

To fully harness the potential of exercise in healthcare, interdisciplinary collaboration is essential [111]. Nurses, along with physicians, physical therapists, dietitians, and other healthcare professionals, should work together to provide comprehensive care [112]. This collaborative approach ensures that exercise is integrated into treatment plans seamlessly, addressing the diverse needs of patients across the healthcare continuum.

#### **3.13 | Considerations in burn wound nursing care**

While exercise can be highly beneficial, it's essential to consider specific factors in burn wound nursing care.

##### **3.13.1 | Timing**

Exercise should be introduced at an appropriate stage in the healing process. Initially, patients may be too fragile or in too much pain to engage in active exercise. Careful assessment and coordination with the healthcare team are crucial.

##### **3.13.2 | Individualization**

Exercise regimens must be tailored to each patient's unique condition, including the extent and depth of burn wounds,

comorbidities, and overall health [113]. What works for one patient may not be suitable for another.

### 3.13.3 | Supervision

Burn patients often require close monitoring during exercise to prevent overexertion, falls, or other complications. Healthcare professionals, including nurses and physical therapists, should be present to ensure patient safety [114].

### 3.13.1 | Pain management

Patients should be assessed for pain before, during, and after exercise. Pain management strategies, such as medication or wound care, should be adjusted accordingly to facilitate exercise [115].

## 4 | Implications for nursing clinical practice

Based on the current research findings, it is feasible to incorporate the identified method into a nursing care program, potentially resulting in its enhancement. In this regard, the following considerations may be taken into account: 1) Tailored Exercise Programs for managing burn wound healing; 2) Pain Management based on physical activities; and 3) Psychosocial Support for psychological rehabilitation.

## 5 | Conclusions

This literature review underscores the emerging role of exercise in nursing care for burn wound patients as a complementary approach to enhance overall recovery and quality of life. By incorporating evidence-based exercise interventions into their practice, nurses can contribute significantly to the comprehensive care and improved outcomes of burn patients. Future research is needed to further refine exercise protocols and guidelines specific to burn wound patients and expand our understanding of the full potential of exercise in this context.

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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: SM, SR, MRZ, MA; Drafting the work or revising it critically for important intellectual content: SM, SR, MRZ, MA; Final approval of the version to be published: SM, SR, MRZ, MA; Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part

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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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