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Physical Needs of Patients with Burn Injuries at Intensive Care Unit as Suggested Protocol of Nursing Care

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Abstract

Background: Patients with burn injuries have unique needs that extend outside immediate medical treatment, encompassing wound management, pain control, nutritional support, and psychological rehabilitation. **Aim:** To assess the physical needs of patients with burn injuries at the intensive care unit as suggested protocol of care. **Design** Descriptive exploratory research design was used. **Subject:** A purposive sample of 100 adult patients diagnosed with first and second-degree burn**. Setting:** The study conducted in the Intensive care units at Ahl Masr Hospital. **Tools:** Two tools utilized for data collection. **First Tool**: Patient assessment questionnaire included, **I:** Patient personal characteristics, **II:** Medical data **III: -** ABCDE Assessment Tool. **Second Tool**: Burn injury physical needs assessment tool included; **Part I:** Wound care assessment needs tool **Part II:** Numeric rating pain scale, and **Part III:** Short nutritional assessment questionnaire. **The results:** the result indicated that 100% of the studied patients' needs regarding wound care were met with 11% of patient don't know the factors affecting wound healing, 55% of patients had severe pain level and 39% used nalorphine, and while 38% of patients were severely malnourished, 62%were moderately malnourished. **Conclusion** There was high positive correlation between pain level and wound care and between pain level and nutritional status; As well there were highly statically relation between total wound care and nutritional status**. Recommendations:** Patients should be given health related needs education based on pain management, nutritional modification, self-wound care and psychosocial care.

Keywords: Burn Injuries, Intensive Care, Nursing Care, Physical Needs Unit

Introduction

Burn injuries are among the most painful and devastating traumas, often causing severe pain due to nerve contact, tissue harm, and inflammation. Effective wound care is critical to manage pain, prevent infections, and promote optimal healing. Proper wound management includes cleaning the burn with sterile solutions, applying appropriate dressings and using analgesics or non-pharmacological interventions like cold therapy to alleviate discomfort. Infection prevention is paramount, as burns disrupt the skin barrier, increasing susceptibility to pathogens like Pseudomonas aeruginosa and Staphylococcus aurous ***(World Health Organization, 2023).***

Body Mass Index (BMI) plays a critical role in the prognosis and recovery of burn-injured patients, influencing metabolic demands, wound healing, and clinical outcomes. Research indicates that both underweight (BMI <18.5) and obese (BMI ≥30) patients face heightened risks, including delayed wound healing, increased infection rates, and prolonged hospitalization. Obese burn patients, in particular, show exacerbated hyper metabolic responses, requiring tailored nutritional support to meet elevated caloric and protein needs ***(Chinchilla et al, 2022).***

On the other hand, underweight patients may struggle with inadequate nutrient reserves, impairing tissue repair and immune function. The obesity correlates with higher complication rates, such as sepsis and graft failure, while severe burns in underweight individuals are associated with higher mortality. The routine

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BMI assessment and individualized nutritional interventions are essential components of burn care protocols to optimize recovery and reduce morbidity ***(Williams et al., 2023).***

The direct response of the body is to enter a state of shock, when a patient suffers from a burn injury, this physiological response can pointedly compromise the patient's overall condition, making it domineering that every aspect of their care is meticulously managed. The urgency of this care cannot be overstated; timely interventions can mean the difference between life and death, or between a full recovery and long-term disabilities. Furthermore, the physical needs of burn patients in the ICU extend beyond immediate treatment; it encompasses ongoing pain management, fluid resuscitation, nutritional support, and infection control. Each of these components plays a pivotal role in the patient's recovery process, influencing not only their physical health but also their emotional and psychological well-being ***(Gorji et al., 2023).***

The effective management of the physical needs of burn patients in the ICU is crucial for their recovery and rehabilitation. This management requires a comprehensive, multidisciplinary approach that brings together the expertise of various healthcare professionals. Nurses play a particularly critical role in this dynamic, as they are often the primary caregivers who coordinate and implement care strategies tailored to the unique needs of each patient. It is essential for nurses and the entire healthcare team to engage in continuous education and stay updated with best practices in burn care management ***(Oh, D., & Choi, Y. J, 2022).***

There were essential and critical aspects of care required for burn injury patients in the ICU. Pain management is one of the most pressing issues, as the nature of burn injuries often results in severe and persistent pain that can hinder recovery and rehabilitation. Fluid resuscitation is another key factor, as burn injuries lead to significant fluid loss and can cause hypovolemic shock if not addressed promptly. Furthermore, nutritional requirements must be considered, as burn injuries increase metabolic demands and necessitate enhanced nutritional support to facilitate healing. Lastly, infection control is vital, as the compromised skin integrity in burn patients heightens their susceptibility to infections, which can complicate recovery and lead to severe complications ***(Britton et al., 2023).***

Significance of the study

According to the World Health Organization (WHO), approximately 11 million people each year suffer a burn that necessitates medical attention, with 180,000 burn deaths occurring globally. Burns are the leading cause of morbidity, including disability, disfigurement, stigma, and rejection. Egypt has one of the world's highest rates of burn-related deaths, with approximately 250,000 people suffering from severe burns each year. Around 40% of these people die because of not being saved within the first six hours of being injured ***(World Health Organization, 2023).*** Burn injuries are the most devastating injuries and major global public health crisis. The numbers are harrowing; the mortality rate of burn victims in Egypt is as high as 37%, compared with the average of 5% in other countries in the region ***(Ahl Masr Foundation, 2019).*** From the investigator's point of view burn injuries are the most traumatic and physically debilitating injuries affecting nearly every organ system and leading to significant morbidity and mortality. Assessing and providing physical needs of burn patients leads to improve burn management, reduce mortality rate and days of hospital stay.

Aim of the study

The study aimed to assess the physical needs of patients with burn injuries at the intensive care unit as suggested protocol of care.

Research question:

What are the physical needs of patients with burn injuries at intensive care unit?

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Subject and Methods

The subject and methods for this study was portrayed under the four main items as follows:

Research design

Descriptive exploratory research was utilized in this study.

Setting

The study conducted in the Intensive care units at Ahl Masr Hospital. Ahl Masr Foundation for Development is the first nonprofit organization in Egypt, the Middle East, and Africa dedicated to researching, preventing, and treating trauma and burn injuries. It is from the largest hospitals in Egypt, and it receives patients from all governorates of Egypt. It consists of 3 floors; the first floor contains Emergency Unit, Administrative Offices and The Outpatient, and the second floor contains 20 beds ICU only 8 pediatric ICU and 12 adults. The third floor contains 3 Operation Rooms.

Subjects

A purposive sample of 100 adult patients from both genders admitted to hospital with first and second burn injuries with age ranged from 20-60 years, and free from patients with psychological disorder

Tools for data collection:

The investigator used two tools to collect the data during the study: -

First Tool: Patient assessment questionnaire consists of three parts:

Part I: Patient personal characteristics as age, gender, place of residence, education level, marital status, monthly income, occupation, and health insurance.

Part II: Medical data

To assess burn reason, burn degree, burn site, TBSA, comorbid diseases, allergy, current medication, previous hospitalization, time from burn to hospital admission and length of hospital stay. The two parts had been developed by the investigator based on recent related literature.

Part III: - ABCDE Assessment Tool adopted from **Resuscitation Council (UK) (2021)** which assesses the patient prognosis throughout hospitalization by assessing airway, breathing, circulation, disability and neurological assessment and exposure and environmental control.

Second Tool: Burn Injury Physical Needs Assessment Tool- (BIPNA)

It consists of three main parts, namely wound care assessment needs tool, pharmacotherapy relieving pain needs and short nutritional assessment questionnaire**.**

Part I: Wound Care Assessment Needs Tool (WCANT)

Was originally developed by **(Bates-Jensen *et al.* 2013)** and adopted by the investigator to assess burn care such as the health team do wound care regularly; The wound be properly cleaned and debrided; The health team follow infection control measures; The burned area covered with dressing from sealed and sterile pack; Patient accepts wound care even in the presence of pain; patients feel that wound helps for quick recovery; Patient know the factors affecting wound healing; The health team instructs the patient about the importance of wound care.

Scoring system: The answer for each statement includes two options in scoring, if the answer is yes, the score will be (2 points) and if the answer is No (1 point). Accordingly, the total score of the WCANT is ranged from 1 to 20. Later, the total score will be summed up and converted into percent, and categorized as follows:

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- The need for wound care is met If the score is ≥ 50 % (10-20)
- The need for wound care is unmet If the score is < 50% (1-9).

Part II: - Numeric Rating Pain Scale (NRPS) utilizing 0-10 ranking to assess pain level and the analgesics being used to alleviate pain as adopted from ***(Pasero & McCaffery, 2010).*** **Scoring system:** Numeric Rating Pain scale is a line starting from "0 to 10 ", where (0) represents no pain, (1-3) mild pain, (4-6) moderate pain, and (7-10) represents severe pain.

Part III: Short Nutritional Assessment Questionnaire (SNAQ) adopted from ***(Kruizenga et al., 2005)***. The SNAQ is a simple nutritional evaluation method that includes two sections it consists of nine questions (four questions about calculation of the BMI and five questions) for hospitalized patients. The same tool also assesses five questions collected from the patients such as: Did you experience difficulty while eating? Did you experience a decreased appetite? Did you use supplemental drinks or tube feeding? Did you experience feelings of fatigue or weakness? and did you lose weight unintentionally?

Scoring system: The answers will be weighted from 1 to 5 points. Score indicating severe malnourishment (≥3 points), and mandate nutritional intervention which requires referral to independent dietitian for further consultation. Whereas ≥2 points denote moderate malnourishment in which patients need enriched meals and two nutritious snacks per day; also, daily intake' increase with approximately 600 kcal and 10–12 g of protein, whilst (1 point) score indicates no intervention is needed.

- Severe malnourishment (≥3 points)
- Moderate malnourishment (≥2 points)
- Indicates no intervention is needed (good nutrition) (1 point)

Validity

The tools were formulated and submitted to five experts in critical care and medical surgical nursing academic staff (3 assistant professors and 2 lecturers) to assess the content validity then needed modifications were done.

Reliability

Cronbach's alpha coefficient was calculated to assess the reliability of the scales used by examining their internal consistency (Tool I part III: 0.788, Tool II part I: 0.849 Tool II part III 0.837) Cronbach's alpha reliability coefficient. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. Higher values of Cronbach's alpha (More than 0.7) denote acceptable reliability. Spearman's correlation coefficient was used to determine correlations between different variables.

Pilot study

A Pilot study was carried out with 10% (not less than 10 patients) of the sample under study to test the applicability, clarity and efficiency of the tools. The modifications were done for used tool, then final form was developed. Patients in the pilot study were excluded from the sample.

I- Administrative Item

An official permission was obtained from the general manger of Ahl Masr Hospital in which the study was conducted. A letter was issued to them from the Faculty of Nursing, Helwan University explained the aim of the study to obtain the permission for data collection.

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Field work

Field work includes the following:

- An approval was obtained from a Scientific Ethical Committee of the Faculty of Nursing at Helwan University and the study subjects individually using a written informed consent obtained from each participant prior to data collection.
- Sampling was started and completed within six months from October (2024) until the end of March (2025).
- The investigator introduced himself and explained the purpose of the study to intensive care unit nurses and to each patient.
- Data collection was done 3 days/week by the investigator in the morning and afternoon shifts.
- The following study tools were filled in and completed by the investigator: patient personal characteristics, medical data of the studied patients some data were taken from the patients and other data from the patient's files, ABCDE assessment tool, physical assessment and burn injury physical needs assessment tool (BIPNA) done to complete the physical assessment tool.
- Burn injury physical needs assessment tool (BIPNA): this tool filled according to patients reported data and nursing intervention applied for the patients within the hospital.
- The Pain assessment scale was filled according to the reported level of patient's pain level
- Patients' medical records were used to obtain the past and present medical history, burn reason, burn degree, burn site, TBSA, previous hospitalization, comorbid diseases.
- The tool took around 25-30 minutes to be filled.

The investigator starts with patient personal characteristics, medical data, burn injury physical needs assessment tool to assess wound care, pain assessment and short nutritional assessment questionnaire

Ethical considerations

An approval was obtained from the study subjects individually and scientific ethical approval was obtained from ethical committee number (40) of the faculty of nursing at Helwan University on 18/3/2024. They will be assured that anonymity and confidentiality would be guaranteed and the right to withdraw from the study at any time. Ethics, values, culture and beliefs will be respected.

IV-Statistical Item

Numerical data were presented as mean and standard deviation (SD) values. Qualitative data were presented as frequencies (n) and percentages (%). Reliability of the questionnaire was assessed using Cronbach's alpha reliability coefficient. Cronbach's alpha reliability coefficient normally ranges between 0 and 1. Higher values of Cronbach's alpha (More than 0.7) denote acceptable reliability. Spearman's correlation coefficient was used to determine correlations between different variables.

The significance level was set at $P \leq 0.05$. Statistical analysis was performed with IBM SPSS Statistics Version 26 for Windows.

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Results

Table (1): Distribution of patient's personal characteristics (n= 100).

Items	N	%
Age:		
20 - <30Years	67	67
30 - <40 Years	17	17
40 -<50 Years	0	0
50 -≤60 Years	16	16
Gender:		
Male	89	89
Female	11	11
Place of Residence:		
Rural	57	57
Urban	43	43
Education Level:		
Read and write	38	38
Secondary school	39	39
Bachelor degree	11	11
Don't read and write	12	12
Marital status:		
Married	33	33
Unmarried	67	67
Monthly Income:		
Not enough	27	27
Enough	73	73
More than enough	0	0
Occupation:		
Employed	50	50
Unemployed	11	11
Manual work	39	39
Health insurance		
Insured	61	61
Not insured	39	39

Table (1) reveals that 67% of the studied patients aged from 20 - < 30Years, 89% were male, 57% from rural areas, and 39%of the studied patients had secondary school. As well, 67% of them were unmarried, 73% of the studied patients had enough income. Furthermore, 50% were employers and 61% of them had health insurance.

Table (2): Distribution regarding medical data of the studied Patients (n= 100)

Items	N	%
Burn Reason:		
Flams	**65**	**65**
Hot fluid	29	29
Chemical	0	0
Electrical	28	28
Burn Degree:		
Second	**100**	**100%**

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Burn Site:		
Face and neck	50	50%
Trunk	**72**	**72%**
upper Extremities	50	50%
Genitalia	0	0
Lower Extremities Lower Extremities	22	22%
TBSA:		
15-25	34	34.0%
>25-35	28	28.0%
>35-45	32	32.0%
>45-55	6	6.0%
Comorbid diseases:		
No diseases	**100**	**100**
A) Diabetes mellitus	0	0
B) Hypertension	0	0
c) Other	0	0
Allergy:	**100**	**100**
A) Yes	0	0
B) No	100	100%
Previous hospitalization:		
Yes	0	0
NO	**100**	**100**
Time from burn to hospital admission (hours)		
<1- 5hr	34	34.0%
>5-10hr	**60**	**60.0%**
>10-15hr	6	6.0%
Mean ± SD	6.24±2.99	
Length of hospital stay(days)		
<1-5day	11	11.0
>5-10day	28	28.0
>10-15day	**55**	**55.0**
>15 and more	6	6.0
Mean ± SD	10.8 ± 4.0	

***Responses were not mutually exclusive**

Table (2) clarifies that 65% of the studied patients had burn because of flams, 100% had second degree burn and 72% of the studied patients had trunk burn. Besides, 100% had not comorbid disease, allergy, and previous hospitalization. Additionally, 60% of them had took >5-10 hours from burn to hospital admission, 55% of the studied patients stayed for >10-15 days

Table (3): Distribution regarding ABCDE Assessment of the studied Patients (n= 100)

Items	N	%
Airway		
Normal	56	56
Airway obstruction	22	22
Stridor and use of accessory muscles	22	22
Upper airway noises	0	0
Absent or diminished air entry	0	0
Breathing		

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Normal	45	45
Tachypnea	49	49
Hypoxia	0	0
Oxygen supplement	6	6
Circumferential burns	0	0
Circulation		
Normal	0	0
Tachycardia	61	61%
Hypotension (hypovolemic shock)	0	0
Hypoperfusion	0	0
Fluid resuscitation	**100**	**100%**
Disability and Neurologic Assessment		
Alert	100	100%
Respond to verbal stimuli	0	0
Respond to pain	0	0
Unresponsive	0	0
Exposure and environmental control		
None	89	89%
Further injury	0	0
Hypothermia	11	11

Table (3) demonstrates that 22% of the studied patients suffered airway obstruction, stridor and use of accessory muscles. Moreover 49%of them had tachypnoea, 100% had fluid resuscitation. Regarding, disability and neurologic assessment, all the studied patients (100%) were alert. Additionally, 11% of them had hypothermia.

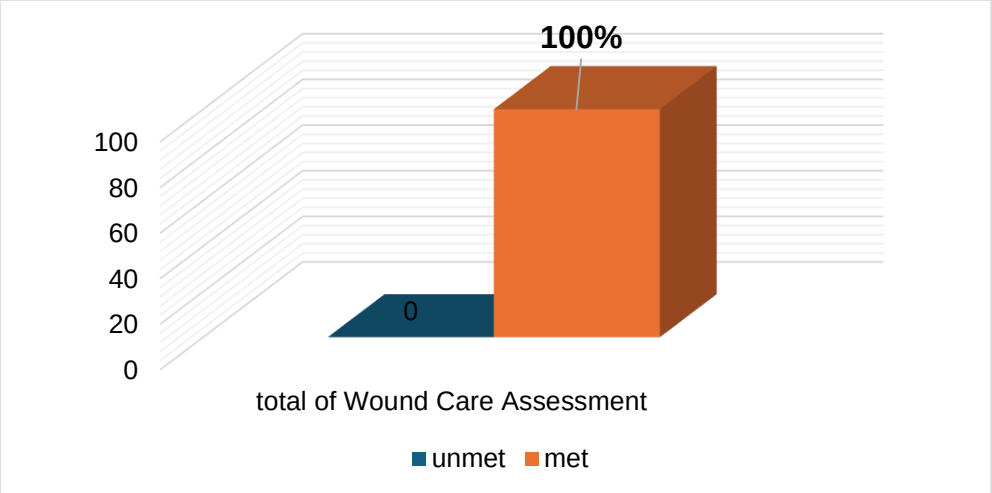

Figure (1): Percentage distribution regarding total wound care assessment among studied sample (n=100)

Fig (1) demonstrates that all the studied sample (100%) had met their needs regarding wound care.

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Table (4): Distribution regarding pain assessment of the studied Patients (n= 100)

Items	N	%
Pain Assessment		
No pain (0)	0	0
Mild pain (1-3)	6	6.0
Moderate pain (4-6)	39	39.0
Sever pain (7-10)	55	55.0
Used Drug (ActiveGradient)		
Nalophine	39	39.0
Ibuprofen	28	28.0
Fentanyl	22	22.0
Paracetamol	11	11.0

Table (4) demonstrates that 55% of the studied patient's reported they had severe pain (7-10). Regarding drug 39% of the studied patients used nalorphine.

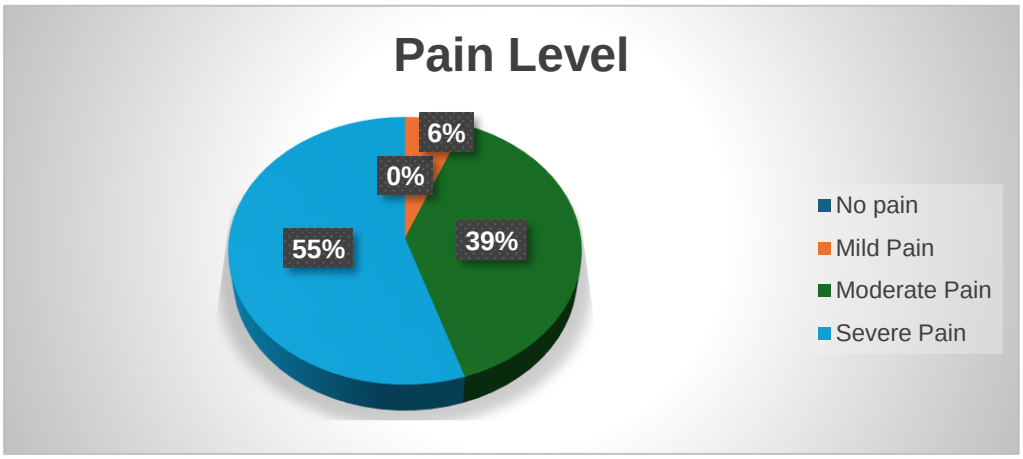

Figure (2): Percentage distribution of pain level among studied sample (n =100)

Fig (2) explains that 55%of the studied sample had severe pain. Moreover, 39% had moderate pain.

Table (5): Correlation between scores of pains, wound care, and nutritional (n =100)

Items		Pain level	Total wound care
Total wound care	**R**	0.449**	
	P	0.000	
Total nutritional status	**R**	0.96**	0.431**
	P	0.000	0.000

P>0.05= Not significant p ≤0.05= Significant p ≤0.001= Highly Significant

Table (5) reveals that there was statically high positive correlation between pain levels, wound care and between pain level and nutritional status; as well there were highly statically relation between total wound care and nutritional status.

Discussion

Regarding the sociodemographic characteristics of the studied patients the study revealed that about two thirds of the studied patients were between 20 and 30 years, indicated that young adults were at a higher risk of burn injuries and it could be attributed to their increased exposure to hazardous

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environments, occupational risks, or lifestyle factors. This result is in accordance with ***Yakupu et al. (2022)*** which about " The epidemiological characteristic and trends of burns globally", who reported that, the incidence of burn injuries patients, particularly among young males were higher and concentrated in 20 years group.

As regard to the gender of patients with burn injuries, a prominent gender imbalance was observed, with males instituting the majority of burn injury cases. This aligns with global data indicating that males are at higher risk of burn injuries, possibly due to greater exposure to hazardous occupations (e.g., manual labor, electrical work, or fire-related jobs) and risk-prone activities.

This results in line with ***Oppressing et al. (2023)*** which about "Epidemiology of burn injury and the ideal dressing in global burn care–Regional differences explored. *Burns*", who reported that, men were mostly obtaining burn injuries.

In contrast with ***Almutlaq et al. (2020)*** which about "Skin burns in Saudi Arabia: causes, management, outcomes and quality of life after skin burns. who reported that, the highest incidence of burn cases was recorded among females.

As regard to Education Level of patients with burn injuries, the education level distribution showed that nearly two fifth of the studied patients had either basic literacy or secondary school education, while the minority held a bachelor's degree. Lower education levels may correlate with reduced awareness of burn prevention measures or engagement in high-risk occupations.

This results in agreement with ***WHO (2022)*** "Burn Prevention Guidelines" who emphasized that illiteracy and Lower education interrelated with higher injury rates.

Additionally, regarding to marital status of patients with burn injuries, more than two thirds of the burned patients were single individuals and this may reflect the younger age distribution, as many patients were in their 20s and 30s. Alternatively, married individuals might have more stable living conditions that reduce burn risks (e.g., shared household responsibilities, better safety practices).

The study results in line with ***Shewaye et al. (2024)*** which about "Outcome of burn injury and its associated factors among burn patients attending public hospitals in North Showa Zone, Ethiopia. Who reported that, from the total of study participants, two thirds were single, and one third were married.

Regarding to the Monthly Income of patients with burn injuries, less than three quarters reported their income as "enough," while more than one quarter stated it was "not enough." No patients reported "more than enough" income. Economic constraints could influence burn risk. However, the monthly Income of patients with burn injuries suggests that socioeconomic status may play a role in burn incidence.

The study results in line with ***WHO (2023)*** "Burn Prevention Guidelines" who emphasized that individual's income had considerable progress in lowering rates of burn deaths, through a combination of prevention strategies.

Regarding health insurance less than two thirds of patients with burn injuries had health insurance, while two fifth were uninsured. Although insured patients predominated, the substantial proportion without coverage raises concerns about financial barriers to post-burn care, including rehabilitation and long-term treatment. Expanding insurance access could improve outcomes for burn injury survivors.

The study results in line with ***American Burn Association (2020),*** which reported that insurance status affects burn care accessibility, particularly in low-income regions.

Regarding the place of residence, the distribution of patients by place of residence indicated more than half resided in rural areas. It reflects the limited access to safety measures, inadequate infrastructure, or delayed access to emergency care in rural settings, which could worsen the severity of burn injuries.

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This result in agreement with ***Chukamei et al. (2021)*** which about "The length of stay and cost of burn patients and the affecting factors" who reported that more than two-third of the patients lived in rural areas (n = 596, 67.04%).

As regards to the Occupational status of patients with burn injuries, the half of the patients were employed, and more than one third were engaged in manual work. This highlighted the occupational risks associated with burn injuries, particularly in industries involving fire, chemicals, or machinery.

This result in agreement with ***Hutter et al. (2022)*** which about "The Life after Burn, Health-Related Quality of Life, Employment and Life Satisfaction" who reported the majority of the participants (*n* = 95, 74.2%) were employed before they sustained the burn injury.

Regarding medical data of the studied patients the study indicated that the two thirds of patients with burn injuries had burn because of flams. These results were in line with ***Elimian and Elimian (2024)*** in a study entitled " Impact of Inhalation Injury on Burn Outcome and Challenges of Burn Care in Selected Adult Major Burns Patients Treated at a Tertiary Institutional Teaching Hospital ", and reported that, Flame burn accounted for the highest etiological agent with Kerosene explosions as the commonest cause. In conclusion, flame burns were the commonest etiological factors in burns.

Regarding degree of burn the findings revealed that all of patients had second degree burn. This finding was in line with ***Cunha et al. (2023)*** in the study about "Clinical and epidemiological profile of burn victims, a retrospective study" who reported that, the prevalence of 82.95% of patients affected by the second degree.

Regarding the Burn Site and Total Body Surface Area (TBSA): The trunk was the most commonly affected burn site more than two thirds, than a half and upper extremities the same. The lower extremities and genitalia were less frequently involved, with the latter showing no reported cases. In contrast with ***Alajmi et al. (2021):*** who study "Clinical, epidemiological, and management aspects of burn injuries in Saudi Arabia–A cross-sectional study" and reported that, the trunk being the less affected anatomical region chest. In disagreement with ***Mulugeta et al. (2021)*** in the study about "Clinical Profiles and the Outcomes of Burn Patients Admitted to the Burn Unit of Jimma Medical Center" who reported that, trunk was the least burned site, which accounted for 14.50% of the anatomic sites burned.

Regarding to the comorbidities and Allergies**,** the findings revealed that prominent finding was the absence of comorbid diseases (e.g., diabetes mellitus, hypertension) and allergies in all patients. It suggested that the studied population was relatively healthy prior to the burn injury, which may have implications for their recovery and response to treatment.

The result was in contrast with ***Dolp et al. (2019)*** in the study about "The effect of diabetes on burn patients: a retrospective cohort study" who reported that comorbidities like diabetes complicating recovery.

As regard to, the time to hospital admission and length of stay, the study findings revealed that revealed that more than half of patients arrived at the hospital within 5-10 hours of the burn incident, with a mean time of 6.24 ± 2.99 hours. This relatively rapid admission may have contributed to better outcomes, as early intervention is critical in burn management.

This result in line with ***Wazir et al. (2025)*** in the study about "Impact of Referral Timing on Mortality Rates in Burn Patients: A Comparison of Urgent vs. Delayed Hospital Admission" who highlighted that Burn injuries patient's early hospital admission is linked to improve patient outcomes and dropping the risk of mortality.

Regarding ABCDE Assessment of the studied patients, the findings revealed that more than one fifth of the patients with burn injuries suffered airway obstruction, stridor, and use of accessory muscles, Airway obstruction and stridor are critical findings in burn patients, particularly those with facial burns

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or inhalation injuries. it indicates partial or complete airway compromise, which can rapidly progress to respiratory failure if not managed promptly.

This finding was in agreement with ***Foncerrada et al. (2018)*** in the study about "The risk of airway complications in burn patients" who reported that the high risk of airway obstruction, stridor in burn patients, particularly those with inhalation injuries, and emphasize the need for aggressive airway management.

Regarding the breathing assessment, the findings revealed that nearly half of the patients with Burn Injuries had tachypnea, it is a common response to pain, anxiety, metabolic stress, or early respiratory compromise in burn patients.

This results In line with ***Greenhalgh and Kiley (2024)*** in the study about "The Diagnosis and Treatment of Infections in the Burn Patient" who reported that burn patient develops a persistent hypermetabolic response to the injury, fevers, tachypnea and tachycardia. Also, in agreement with (***D'Abbondanza and Shahrokhi 2021):*** in the study about "Burn infection and burn sepsis " who reported that patients with Burn Injuries had presented with tachypnea, altered mental status, oliguria, tachycardia and hypotension.

Regarding the circulation assessment, the findings revealed that all of patients required fluid resuscitation. The high percentage of patients requiring fluid resuscitation reflects the systemic impact of burn injuries and the significant fluid shifts that occur in these patients. This result In line with (***Ghosh 2022):*** in the study about "Fluid Resuscitation in Burn" who reported that the Intravenous fluid resuscitation is the cornerstone of managing patients with major burn.

Regarding disability and neurologic assessment, the findings indicated that the all the patients were alert. The nonappearance of neurologic deficits is a positive finding, indicating that the burn injuries did not directly affect the central nervous system.

This result In line with ***Allahham et al. (2024)*** in the study about "The impact of burn injury on the central nervous system" who reported that the burn trauma not only impacts on the CNS directly, absence of neurologic deficits is associated with better outcomes in burn patients.

Regarding Exposure and Environmental Control, more than tenthe of patients with Burn Injuries had hypothermia. It indicated that temperature regulation measures were largely effective. Hypothermia is a known risk in burn patients due to the loss of skin barrier function and evaporative heat loss. It can exacerbate metabolic stress, impair wound healing, and increase the risk of infections.

In disagreement with ***Alonso-Fernándezet et al. (2020):*** in the study about "Analysis of hypothermia through the acute phase in major burns patients" who reported that Major Burns' patients usually present hypothermia after suffering a thermal burn.

Regarding pain assessment the study findings indicated that more than half of the patients with burn had severe pain (7-10). In line with ***Parvizi et al. (2023)*** in the study entitled " A systematic review of life satisfaction and related factors among burns patients. Who reported that, burn injuries produce some of the most painful patient.

Regarding to drug that used as pain killer, the study findings indicated that more than third of burn injury patients used nalorphine. Nalorphine was the most commonly used drug, followed by Ibuprofen and Fentanyl. It reflected the need for a multimodal approach to pain management, combining opioids with non-opioid analgesics to address the complex nature of burn pain.

This result In line with ***Chinchilla et al (2022)*** in the study entitled "Efficacy of opioids and non-opioid analgesics in the treatment of post procedure pain of burned patients: "who reported that nalbuphine had high effectiveness for relief of burn pain

As regarding Correlation between pain scores, wound care, and nutritional status of the patients with Burn Injuries at Intensive Care Unit The study findings indicated significant positive correlation ($r = 0.449$, $p < 0.000$) between pain level and total wound care. This indicates that as the intensity of

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pain increases, the complexity and requirements of wound care also worsen. This relationship highlighted the need for effective pain management strategies to facilitate better wound care and improve patient comfort. In agreement with ***Woo et al. (2024)*** in the study about "Exploring the effect of wound related pain on psychological stress, inflammatory response, and wound healing" who mentioned that pain is a significant factor in wound management, as it can affect patient compliance and healing outcomes.

Regarding the relation between pain level and nutritional status. The study findings indicated significant positive correlation between pain level and nutritional status. This strong association suggested that patients experiencing higher levels of pain are also likely to have poorer nutritional status. Adequate nutrition is crucial for tissue repair and wound healing, and pain can interfere with a patient's ability to consume and absorb necessary nutrients.

This result in agreement with ***Herberger et al. (2020)*** in the study about "Nutritional status and quality of nutrition in chronic wound patients" who reported that higher pain levels are closely associated with poorer nutritional status. Chronic pain can lead to reduced appetite, difficulty eating, and metabolic changes, all of which can negatively impact nutritional health.

Regarding the relation between total wound care and nutritional status; the study findings indicated significant positive correlation between total wound care and nutritional status is also significant. This implies that the nutritional status of a patient directly impacts the effectiveness of wound care. Malnourished patients may experience delayed wound healing and increased risk of infection, highlighting the importance of nutritional support in the wound care process.

This result in agreement with ***Rowan et al. (2015)*** in their study about "Burn wound healing and treatment" Who reported that better wound care practices are associated with improved nutritional status. Proper wound care often includes nutritional interventions, such as protein supplementation and micronutrient support, which are critical for tissue repair and immune function.

Conclusion

The result of the study concluded that all the studied patient had satisfaction regarding wound care with more than a half of patients had severe pain and more than a third of patient were severely malnourished. Additionally, there was a high positive correlation between pain level and wound care and between pain level and nutritional status; as well there were highly statically relation between total wound care and nutritional status.

Recommendations

Based on this study results, the study recommended the following:

- **On the patient and family level**

1. A structured educational session on self-care, wound dressing, nutrition, and psychological coping strategies burn patients and their families.

- **On the nurse's level**

1. Nurses should be trained to assess nutritional deficiencies and provide patient education on diet modification that enhance wound healing and recovery.
2. Provide in-service training on health-related needs based on pain management, psychosocial care integrated into nursing education.

- **On the community level**

1. Establish Public education on fire safety, first aid for burn and early hospital admission should be integrated in community health programs.

- **On educational level**

1. Develop training programs involving physicians, nurses, dietitians, and psychologists should be developed to promote comprehensive patient care.

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2. Standardized training on the Parkland formula, monitoring fluid balance, and preventing hypovolemic shock should be emphasized.

➢ **On organizational level**

1. Performing regular workshops and evidence-based practice training in hospitals and educational institution to emphasize the burn management clinical guidelines.
2. Establish a burn emergency response system, including public awareness, pre-hospital care training for paramedics, and streamlined referral processes from lower-level facilities.

➢ **Further Research**

1. Longitudinal studies assessing post discharge functional and psychological recovery, including rehabilitation strategies to improve quality of live for burned patients.

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