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Compliance with Burn Pain Management Protocol in Governmental Hospitals – Gaza Strip

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Compliance with Burn Pain Management Protocol in Governmental Hospitals – Gaza Strip

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Dedication

I dedicate this work to the sake of Allah, my Creator and my master.

To my parents whose affection, love, encouragement and prays day and night make me able to get such success and honor.

To my dear wife, for her understanding, support and encouragement.

To my children; Ibrahem, Ismael, Rima, Lana and Mahmoud

To my brothers, sisters, friends and colleagues.

To everyone who contributed to getting this study a reality, thank you.

Yousuf Ismael Al Shami

Declaration

I certify that this thesis submitted for the master's degree is the result of my own research, except where otherwise acknowledged, and that this thesis or any of its parts has not been submitted for a higher degree to any other university or institution.

Signed:

Yousuf Ismael Al Shami

Date:…… /…… /…….

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Abstract

Adequate pain management is a compelling and universal requirement in health care. Poor pain management can lead to a marked decrease in physical and psychological outcomes, lower patients' overall quality of life, addiction, poor healing process, long hospitalization period, increased expenses and the cost of health services. Effective management of pain results in improved patient outcomes and increased patient satisfaction. In 2012, the Palestinian National Protocols for Burns Care and Management was established, where standards and mechanism of action have been developed to deal with the pain caused by burns.

This study aimed to assess the compliance with burn pain management Palestinian protocol in the governmental hospitals in Gaza Governorates in order to enhance the quality of burn care and quality of patient's life.

The study is triangulated, descriptive and cross-sectional one. All health care providers, doctors and nurses, who are working at the Adnan Alalami Burn Center in Al Shifa Medical Complex and burn department in Naser Medical Complex were included in the study and they are 59 participants, with a response rate of 89.8%. Four tools were used to collect the data. The quantitative data were represented by three tools: the first one is interviewed questionnaire to study participant's level of knowledge, the training about the protocol, and the socio-demographic factors that affect the participant's level of knowledge, also the barriers to pain management protocol application. The second tool is the compliance checklist of health care providers through reviewing of 89 medical files to assess how the pain management protocol was implemented and the level of compliance. The assessment checklist of the physical environment was the third measurement tool. The qualitative data included 5 in-depth key informant interviews of medical staff to find out the barriers behind the non-adherence to pain management protocol.

The results of the study revealed that there are gaps and barriers facing burn pain management and protocol implementation in the Gaza Strip. About forty-seven percent of the participants are aware of the presence of Palestinian national protocols for burns care and management. Also, the knowledge level about pain management protocol is 44.9%, and the compliance level is 12.8%. Furthermore, eighty percent of participants didn't receive or didn't remember if they had any training course about the protocol. Sixty-eight percent of the study participants answer that there is no follow-up by the management to ensure the implementation of the protocol, and 16% of the study participants didn't know if the management follow-up or not. Moreover, there is a severe shortage of most specialties required in the multidisciplinary medical team. Only three specialties are present in the burn units; plastic surgeon, a nurse, and a physiotherapist. Also, there is a severe shortage of medical supplies and medications necessary for controlling burn pain. There are underutilization of non-pharmacological methods of pain management. There are no statistical differences between knowledge and demographic data (age, marital status, work place, academic qualification, and experience), while there are statistical differences between knowledge and gender and job title.

The study revealed critical low levels of compliance among health staff with burn pain management protocol. There is an urgent need to adopt managerial policies and to activate the monitoring and supervision role of auditing system in both hospitals to improve health care providers' compliance with the protocol. Continuing education and training programs for the burn team are crucial steps to promote compliance. Urgent need of a multidisciplinary team to deal with burns patients, especially anesthesiologists.

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List of Abbreviation

ABA	American Burn Association
ANOVA	One-way Analysis of Variance
APS	American Pain Society
BSC	Bachelor of Science Certificate
GG	Gaza Governorates
GS	Gaza Strip
ICU	Intensive Care Unit
JCAHO	Joint Commission Accreditation of Healthcare Organization
KII	Key Informant Interviews
Km	Kilometer
Km^2	Kilometer square
MAP-UK	Medical Aid for Palestine - United Kingdom
MD	Median
MOH	Ministry of Health
NGOs	Non-governmental Organizations
No	Number
NSAIDs	Non-Steroidal Anti-Inflammatory Drugs
PADP	Pain, Agitation and Delirium Protocol
PCBS	Palestinian Central Bureau of Statistics
Ph.D.	Doctor of Philosophy
PHC	Primary Health Care
PTSD	Post-Traumatic Stress Disorder
SD	Standard Deviation
SPSS	Statistical Package for Social Sciences
TBSA	Total Body Surface Aria
UNRWA	United Nations Relief and Works Agency for the Refugees of Palestine in the Near East
USA	United States of America
VAS	Visual Analogue Scale
WB	West Bank
WHO	World Health Organization
Y/N	Yes/ No

Chapter One
Introduction

1.1 Background of the study

Burn injury is the most painful and disfiguring forms of trauma, as it affects the skin, that is the largest and most visible organ. Burn injury is classified from the most damaging of all injuries; hence a good pain control is necessary for more than simply humane reasons. Despite major improvements in burn wound management and survival, the burn pain management is inadequately treated globally (Richardson & Mustard, 2009).

The International Association for the Study of Pain (IASP) defined the pain as "*an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage*" (Loeser & Treede, 2008, Page 475).

The patients with burns suffers from severe pain at the time of the burn (acute phase) and during subsequent treatment and rehabilitation. Pain has adverse physiological and emotional effects. Also, the occurrence of neurological shock is one of the most serious complications that may occur due to the lack of control of pain, as well as delay of the wound healing process, disturbances of sleeping pattern, fear and anxiety and lack of participation in daily activities.

Burn pain can last for a long period (chronic pain) and have a negative impact on a person's quality of life and impede recovery from injury. Unrelieved pain can become a syndrome in its own right and cause a downward spiral in a person's health and outlook (Solaro et al., 2013).

Also, the complications results from poor pain management are wide-ranging; poor submission with rehabilitation therapies, increased pain sensitivity and loss of trust in the burn team. Uncontrolled burn's pain increases the incidence of chronic pain associated with depression, Post Traumatic Stress Disorder (PTSD), and poor wound healing (Rimaz et al., 2012).

So pain management is an important factor in better outcomes that facilitate recovery, prevents additional health complications, improves an individual's quality of life and can influence a person's participation in family life and work and affect mood.

Pain management is the process of providing medical care that alleviates or reduces pain, it covers pharmacological methods as; medications, and non-pharmacological methods such as; physical and psychological methods.

Providing adequate analgesia in a burn patient is a challenge to clinicians. Wound care procedures most likely lead to trauma and severe pain in burn patients, and pain intensity faced during treatment procedures may also rise over time. Truly, the children are less likely than adults to receive enough painkiller drugs during the therapeutic procedures, despite the fact that burn pain is as painfully in a child as an adult (Kiplagat, 2013).

Therefore, laws are enacted and relevant scientific research protocols are put in place to better serve patients with burns and improve the quality of life they live, as well as to reduce the length of stay in the hospital and the consequent reduction expensive treatment costs, and to avoid potential psychological illnesses such as depression and PTSD.

Noncompliance with guidelines and protocols became a burden problem, especially in Palestinian fragmented health systems, which is always in emergencies and crises, it needs more evaluation and management, for that the researcher main objective is to assess the compliance of medical staff with burn pain management protocol in governmental hospitals in the Gaza Strip (GS).

1.2 Problem statement

Burn injuries are a horrible health problem worldwide, it affects over 11 million people each year, which equivalent of 30,000 people burned every day, it has a serious long term implications such as; enormous suffering, lifelong disability, and lastly death not only for the individual but the viability of many health care systems globally (Interburns, 2018).

Burns are a global health problem, accounting for an estimated 180 000 deaths annually. The majority of these occur in low- and middle-income countries. In 2004, nearly 11 million people worldwide were burned severely enough to require medical attention. In India, over one million people are burnt every year. Also, around 173 000 Bangladeshi children are burnt every year (WHO, 2018).

In Norway, costs for hospital burn management in 2007 exceeded €10.5 million. Furthermore, In South Africa an estimated US$ 26 million is spent annually for the care of burns (WHO, 2018).

According to American Burn Association (ABA), Burn injuries continue to be one of the leading causes of unintentional death and injury in the United States. Between 2011 and 2015, approximately 486,000 fire or burn injuries were seen at emergency departments. In 2016 alone, there were 3,390 civilian deaths from fires (American Burn Association, 2018)

In 2014 the number of patients treated in the emergency department of Al Shifa hospital was 2987 patients. In Naser hospital there were no data registered about patients were treated in the emergency department, according to the archive patients files of both hospitals Shifa and Naser for the year 2014, 458 burn patients were hospitalized for at least one day in both burn units (Abdel Rhaman, 2016).

From the beginning of 2019 until the end of October, the total number of cases admitted to the Adnan Alalami Burn Center at Al Shifa Hospital was 278 cases with a total number of 24-hour admission days was 3440 days. While at the end of 2018 the total number of admitted cases is 322 cases with a total number of 24-hour admission days was 3552 days. This statistic does not include patients treated in the emergency departments, as well as patients treated in primary care centers and the cases that followed in the outpatient clinics where there are no accurate statistics, but the number of cases is estimated to be much more of that admitted to the hospital.

On the other hand, and according to the reports of the MOH, since the start of the Great March of Return that started on 30 March 2018 until 23 November 2019, the number of burns injuries reached 7.4% (1444 injured) of the total number of injuries (Ministry of Health, 2019b)

According to the researcher experience in the burn unit, he found that the burn pain severity depends on many factors such as; characteristics of burn, nature of burn care, pain management practices during care and other related factors. All of these factors can affect the burn healing process and the curing time.

Despite significant progress, the psychological and physiological adverse effects of uncontrolled pain remain substantially unresolved. Poor pain management can lead to a marked deterioration in the overall quality of patients' life with physical and psychological outcomes, addiction, poor healing process and long hospitalization period; also neurogenic shock may occur during wrong burn pain care.

Also, the consequences of ineffective pain management increase the expenses and the cost of health services, whereas the cost of health services provided to a patient suffering from burns is one of the highest costs that is burden on health providers, as in the Palestinian Ministry of Health (MOH).

So, effective pain management is a compelling and universal requirement in health care, it's improved patient outcomes, increase patient satisfaction, better interventions can improve patients' perceptions and attitudes of pain. Also, activation of multidisciplinary teams can lead to enhancements in the implementation of pain management protocols, measurement degree of pain, understanding scales, differentiation of pain degree and curing it (Glowacki, 2015).

Unfortunately, there is a lack of knowledge about compliance with protocols; there are also no studies that measure the extent of adherence to the pain management protocols especially with burned patients in Palestine. Consequently, this is the first study to assess the compliance with burn pain management protocol in governmental hospitals in GS, on the basis of the Palestinian National Protocols for Burns Care and Management.

1.3 Justification

World Health Organization (WHO) defines palliative care as *"an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual"* (WHO, 2002). Palliative care provides relief from pain and other distressing symptoms.

There are many of the justifications for the researcher to do this study, in light of the high rates of burns of all types and various causes, including wars, blockades, a deteriorating economic and social situation, as well as the Great March of Return, and the complications arising from poor pain management, which mentioned above. So it's important to decreasing burn pain which can increase physical and psychological outcomes, promote patients' overall quality of life, faster wound healing, reducing hospitalization period as much as possible, avoid patient addiction and decreasing expenses and the cost of health services (Widgerow & Kalaria, 2012).

Likewise, on the Palestinian health care system, which is characterized by a lack of resources and increased expenditures on health services, and its dependence mainly on donors to cover those expenses, therefore medical procedures and health services must be controlled by guidelines and protocols, which reduces wasted expenses, as it was mentioned in the financial report of the MOH in the GS in 2018 which the actual payments on medications reached 16.7% (about 75 million shekels) of the total operating expenses of the ministry (Ministry of Health, 2018).

Also, from the consequences of ineffective pain management increases the expenses and the cost of health services, whereas the cost of health services provided to a patient suffering from burns is one of the highest costs that is burden on the Palestinian health care system. Unfortunately, there is no study or report on the actual cost of daily care for a burn patient in Palestine or the GS.

There are scarcity of studies conducted about pain management in the GS and West Bank (WB), so this study considered the first study about burn pain management in GS and WB. Good pain management is very important in burn care. Therefore, in 2012, the Palestinian National Protocols for Burns Care and Management was developed, where standards and mechanism of action have been developed to deal with the pain caused by burns. Before this date there were no protocols on how to deal with burns patients, especially in case of pain management (annex 1).

After the establishment of the protocol and its application to burn patients, the researcher noted that there is a large gap between what is stated in the protocol and what is applied?!, which negatively affects the quality of medical services provided and the patients' quality of life. For that the researcher designed this study to assess the compliance with burn pain management protocol in governmental hospitals in the GS.

1.4 Study objective

1.4.1 General objective

To assess the compliance with burn pain management protocol in the governmental hospitals in Gaza Governorates (GG) in order to enhance the quality of burn care and quality of patient's life.

1.4.2 Specific objective

1. To identify health care provider knowledge about pain management protocol and its application.
2. To assess the health care provider compliance level with pain management protocol.
3. To examine the relationship between socio-demographic characteristic with knowledge level with pain management protocol.
4. To know the differences of compliance level among nurses and physicians, as well as workplace
5. To determine the barriers with compliance to pain management protocol.
6. To suggest the recommendations which improve the compliance with burn pain management protocol.

1.4.3 Research question

1. What's the compliance level of health care provider with burn pain management protocol?
2. Do the health care providers know about pain management protocol and its application?
3. Dose the health care provider socio-demographic age, gender, marital status, education, and job title affect the knowledge level?
4. Is a multidisciplinary medical team available to control burn pain?
5. What types of pharmacological and non-pharmacological analgesics that are used for burns patients?
6. What are the barriers of compliance to burn pain management protocol?
7. What are the recommendations that improve compliance rate with pain management protocol?

1.5 Context of study

1.5.1 Socio-Demographic characteristics of GG

GS is the southern part of the Palestinian coastal plain of the Mediterranean Sea; in the form of a narrow strip in the north east of the Arab Republic of Egypt, constituting approximately 1.33% of occupied Palestine (annex 2). The GS beach on the Mediterranean Sea is about 42 kilometers (km) in length, and width between 6 and 12 km. The total area

of GS about 365 km² with 1.96 million residents, which 39.9% of total population of Palestine(Ministry of Health, 2019a; PCBS, 2019). It is classified as one of the most density populated areas in the world with more than 5374 persons/km² (Ministry of Health, 2019a). And it is divided into five governorates: North Gaza, Gaza City, Mid Zone, Khan Yunis and Rafah (PCBS, 2018b), (annex 3).

Regarding to the results of the Population, Housing and Establishments Census (2018), Gaza population is considered a young society, almost half the population (48%) of the GS is below the age of 17 years and the average household size is 5.6 (PCBS, 2018b). This is likely to rise in the near future, because of the annual rate of population growth is 3.3% in 2016 (PCBS, 2017).

The persistent economic deterioration and the execution of even aggressive siege on Gaza, the poverty rate is increasing in the last years especially after 2014 aggressive war. This deterioration in economic status has an effect all of economic, social and psychological aspects of life, as well as affects the monetary access to health care services. Moreover, it might increase the cost of burn unit services which is directly received services from financing of health system. Furthermore, financial catastrophic may lead to consequences on decreasing the utilizing of secondary health care services.

1.5.2 Health care system

The health system in the Palestinian territory has three distinct political, financial and coordination features. It operates in a context of political instability and conflict, which undermines effective system governance and its financial viability, is severely constrained by its dependence on donor funding, which is subject to fluctuations depending on political concerns. In addition to that, the coordination and collaboration challenges of implementing the MOH programs in the WB and GS are further impediments for the planning and management of health services under occupation (Manenti et al., 2016).

The Israeli occupation and the hard-wearing siege of the GS and the internal political separation and the economic crisis of the situation have severely negative impact on the infrastructure and the quality of health services in the GS, mainly after the third aggressive war on the GS in 2014 (Health Cluster, 2014). Also, the ten years of division, closures, and conflict in GS have had a significant impact on administration and health care system in Gaza (United Nations, 2017).

There is five main health care provider in Palestine that includes; MOH, United Nations Relief and Works Agency for the Refugees of Palestine in the Near East (UNRWA), Non-Governmental Organization (NGOs), Palestinian Military Medical Services and Private sector (Ministry of Health, 2017).

MOH is the main player, it provides primary, secondary and tertiary health care for the whole of the population, and the UNRWA is a second player, it provides health care at the primary and secondary level in GS.

In GS, there are 158 primary health care centers, and 32 hospitals are running by four main health care providers, which is the MOH, UNRWA, NGOs and private sectors (Ministry of Health, 2019a).

1.5.3 Secondary health care services (SHCs)

The secondary health care delivery system is a mix of governmental; NGOs, UNRWA and private providers, and they play a vital role in health care quality and outcomes, as well as fundamental to introduce high-performance health care services.

There are 81 hospitals in Palestine; 49 are in WB and 32 are in GS, with a total number of 6,146 beds are in governmental, NGOs, private and UNRWA hospitals; 60.1% in WB and 39.9% in GS (PCBS, 2019).

In WB there is one burn unit in a Rafidia Hospital that covers whole WB for the moment. In GS there are two units in the governmental hospitals, the first unit in Al Shifa Hospital it was established in 1982 and it contains 6 beds, one doctor and seven nurses. In 1992 transferred department of burns to the new section in the hospital consisting of 8 beds, then in 1999 it was added an operating room and an isolation room.

In 2008, the ideal burns unit was established by Adnan Alalami, it consists of I.C.U which has three beds, one operating room and burn ward with six rooms every one contains two beds and one T.V., one room for whirlpool and another room for dressing. Also, one room for physiotherapy and a big room for play therapy. The nursing team has extensive practical experience in the field of burn care, and some of them have scientifically qualified, doctors specialize in burn and plastic surgery.

The second unit in Naser hospitals was established by Medical Aid for Palestinians (MAP) in 2009, as a part of the surgical department. Both burn units consist of 14 physicians, 45 nurses and 4 physiotherapists.

The Burn Center provides many health services to patients suffering from burns such as providing qualified medical staff in the field of burns and plastic surgery, surgical procedures such as debridement, skin grafting, and reconstruction surgery, Intensive care fully equipped to provide health services for critical burns, Physical therapy as well as psychosocial support, a room for games to contribute to the success of physiotherapy and psychological services.

1.6 Operational Definition

- **Compliance:** the extent to which medical staff's behavior and practice corresponds with agreed recommendations according to burn care protocol (Sabaté, 2003).
- **Pain**: an unpleasant sensory and emotional experience associated with burn injury that can be measured by different types of pain assessment scales.
- **Pain management**: means pharmacological and non-pharmacological interventions that aim to reduce or eliminate burn pain.
- **Palliative care**: is an approach that improves the quality of life of patients and their families facing the problem associated with life-threatening illness, through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual (WHO, 2002).
- **Pain management protocol:** means the Palestinian national protocols for burns care and management that published in 2012 in cooperation with MAP.
- **Multidisciplinary burn team:** a group of specialists to provide collaborative and comprehensive care, the burn team consists of burn and plastic surgeon, anesthesiologist, nurse, intensivist, physiotherapist, nutritionist, psychosocial expert, and pharmacist.

Chapter Two

Conceptual Framework and Literature Review

2.1 Conceptual Framework

A conceptual framework is a tool used by researchers to develop a framework for their research studies, where it makes it easy for researchers to find links and relationships between existing literature and their research objectives and goals (Miles & Huberman, 1994). Also, it helps to identify important variables and their potential relationships (Bordage, 2009).

Medical staff compliance with the burn pain management protocol was studied by using the conceptual framework developed by the researcher that demonstrates the domains that affect the research objectives and goals. Each domain contains variables (Figure 1).

Figure 1: Conceptual framework

There are many factors that influence the extent to which the health care providers are committed to applying the burn pain management protocol. So this study examined these factors, independent variables, including the staff knowledge and practice, availability of a multidisciplinary medical team, training, and the supportive system. Also, the dependent variable or the outcome which is compliance with the burn pain management protocol in governmental hospital – GS is included in the study.

2.1.1 Socio-demographic characteristic of health care providers

Compliance with burn pain management protocol may be affected by participant socio-demographic characteristics, including gender, age, education level, years of experience in burn unit and job title. These important factors may affect the participant's compliance and application of the protocol.

2.1.2 Staff knowledge and practice

Staff knowledge can play an important role in health care provider practices and the protocol application. So in this study, the researcher identifies health care provider knowledge about the presence of the burn pain management protocol, pain assessment techniques and usage of medication that stipulated in the protocol and study its importance in compliance with the protocol.

2.1.3 Training

Training is the process of making sure health care providers understand the protocol and know how to adhere to them in their daily work. In order to improve compliance, it is a must offer training to help health care providers understand the rules and regulations of the protocol. Therefore, the training has a very important role in achieving the commitment of health care providers to implement the burn pain management protocol.

2.1.4 Supportive system

It is a set of things that are essential for system supporting, contain availability of job aids (medications, supplies and needed medical equipment), and administration support through supportive policies and monitoring, supervising, evaluating compliance with the protocol, as well as support of burn unit design and its appropriateness for application and compliance to the protocol.

2.1.5 Multidisciplinary medical team

Multidisciplinary activities are essential to ongoing improvements and rehabilitation understanding and physiological, psychological and emotional recovery of burn patients (Cambiaso-Daniel et al., 2018). According to the Palestinian national protocol for burn care and management, the multidisciplinary medical team consists of a physician, surgeons, anesthesiologists, intensivists, nurses, nutritionist, physiotherapists, psychosocial worker, and others. So the presence of a multidisciplinary medical team is very important for adherence with the protocol.

2.2 Literature Review

2.2.1 Burn definition and Pathophysiology

A burn is an injury to the skin or tissue caused by heat, inhalation, electricity, chemicals, radiation or trauma (Herndon, 2012).

Damage from burns may be minor or may present a life-threatening emergency depending on the intensity of the heat, the total area of burned tissues, and the length of skin exposure. Most burns are minor injuries at home or in the workplace. The most common causes of burns are fire or flames and scalds from hot liquids and steam (American Burn Association, 2017).

Burn results in a local inflammatory response and a systemic inflammatory response if it is major (Kiplagat, 2013). Following major burns, there is an increase in heart rate due to release of catecholamine and hypovolemia due to the shift of fluid volume in the body's compartments. Cardiac output may decrease initially but returns to normal if there is adequate fluid resuscitation.

2.2.2 Epidemiology of burns

Burns is an international public health issue with an estimated 180,000 deaths each year. Most of these occur in low- and middle-income nations, with roughly two-thirds in the WHO regions of Africa and South-East Asia (WHO, 2018).

In India, more than 1 000 000 people are burned moderately or severely every year, and nearly 173 000 children in Bangladesh are burned moderately or severely yearly, while in Egypt, Colombia, Pakistan and Bangladesh, 17% of children with burns are temporarily

disabled and 18% are permanently disabled. Also, in rural Nepal the burning is the second common cause of injury, accounting for 5% of disabilities (WHO, 2018).

Between 2010 and 2014 approximately 486,000 people were seen in the U.S. emergency departments for the care of non-fatal burn injuries, and 3,275 fire deaths in 2014 alone, including 2,795 deaths from residential fires, 345 from vehicle accident fires and 135 from other causes (American Burn Association, 2017).

Unfortunately, Palestine is no exception to that, in 2014 the number of patients treated in emergency departments were 2987 patients of Al Shifa hospital only, and according to the archive patients' files of both hospitals Al Shifa and Naser for the year 2014, 458 burn patients were hospitalized for at least one day in both burn units. At the GS level, the incidence rate of burn patients admitted to burn units in GG, which was 25.5 per 100,000 for the year 2014 (Abdel Rhaman, 2016).

2.3 Burn pain

2.3.1 Pathophysiology or mechanism of pain

Pain is personal and subjective phenomena unique to every individual. According to the IASP, the pain is defined as *"an unpleasant sensory and emotional experience associated with actual potential damage"* (Kumar & Elavarasi, 2016).

For all health care providers and their clients, burn pain is a unique and complex problem. The understanding of burn pathophysiology and the pharmacological and non-pharmacological treatment of burning pain will improve the patient's perception of burning pain. The acute pain that is associated with a burn injury is due to stimulation of skin nociceptors that respond to heat called thermoreceptors, mechanical receptors and chemical nociceptors are stimulated by endogenous chemicals, such as those released during an inflammatory process (i.e., histamine, leukotrienes, and substance P), or exogenous chemicals, such as contact with caustic of acidic materials. Completely destroyed nerve endings will not convey pain, but those that remain undamaged and exposed will cause pain throughout the care time and treatment course. These immediate pain sensations are elicited by activity in the unmyelinated C- and thinly myelinated Ad-primary afferent neurons that synapse with neurons in the dorsal horn of the spinal cord (James & Jowza, 2017).

Clinically, this is perceived as increase sensitivity to touch, such as with wound care and applying topical agent in the injured area, as well as chemical stimuli such as antiseptics or other topical applications. This is called primary hyperalgesia. The skin surrounding the area of tissue damage is also becomes sensitized afterward. This is mediated by the spinal cord and exacerbated by the mechanical stimulation that occurs as a result of frequent dressing changes. This is called secondary hyperalgesia (Norman & Judkins, 2004).

2.3.2 Components of burn pain

Burn pain includes several factors that induce serious annoyance. Background pain is felt at the injury site and surrounding areas. It is generally constant and made worse by movements such as turning in bed, changing position and mobility.

During the course of treatment, the therapeutic procedures produce pain such as dressing changes, wound cleaning, and physiotherapy sessions. Other pain sources include the immobilization of extremities in splints and certain surgical procedures such as skin grafting.

The last component of burn pain is related to tissue regeneration and healing process. When nerves regenerate along with those damaged at the time of burn, pain is experienced along with intense tingling or itching sensation that called Pruritus (Melzack & Wall, 2003).

2.3.3 Pain intensity and variations

Many factors affect pain intensity for burns patients. The depth, site and size of burn influences clinical outcome of burn trauma. First degree burns cause less pain than second degree, since the damage is only the superficial layer of the epidermis, in difference to superficial second degree burns (superficial partial thickness burns) which the epidermis and papillary dermal damage occurs and nerve endings are exposed. In deep second degree burns (deep partial thickness burns) there is complete epidermal and dermal destruction are present. Third degree burns (full thickness burns) the entire skin layers are destroyed. Fourth degree burns, this classification can be used when the underlying fascia, muscles and even bones are involved in burning (Bolenbaucher et al., 2016).

2.4 Assessment of pain

Assessment of pain gives us information about how pain is felt during burn treatment by a single patient; we can see trends emerging and schedule medications accordingly. In addition, standardized pain assessment tools allow us to compare the pain management of one patient with another, as well as of one burn unit pain management regime with other burn units in order to assess the efficacy of pain management protocols (Meyer et al., 2018).

Regular and ongoing pain assessment is important to initiate and evaluate the effectiveness of pain treatments. Assessment of pain can allow the patient to be evaluated to direct the health care providers toward the source of the pain and thus its effective management. The importance of good analgesia is to allow maximum gain from therapies, and potentially faster rehabilitation, as well as reducing length of stay in the hospital. Assessment of pain is produced by two types of pain assessment tools, the first one is "self-report" for patients who able to express their feelings and the other one is "behavioral or observational" or for people who cannot self-report (Gregory & Richardson, 2014).

The primary source of pain assessment should be self-report. Reports of pain form families and health care providers are taken into account for children and adults who are unable to give self-report. Assessment of pain should also include assessment of behavioral indicators of pain for non-verbal individuals. The most reliable measure of pain is self-reporting methods as long as the person in pain is listened to and believed (Carr, 1997).

Severity of pain is the most important in clinical terms and the most commonly assessed element of pain. Pain severity assessment tools include the Visual Analogue Scale (VAS), verbal descriptor scale, numerical rating scale, numerical descriptor scale and the wong baker smiley faces. In the burned patients, the VAS was validated, sensitive and useful (Kiplagat, 2013).

Behavioral pain assessment tools are used for patients who not able to self-report pain such as critical care patients in the intensive care unit and people with dementia. Its include the critical care pain observation tool, which involves of four items and its scores range from 0 - 8 (Gélinas et al,. 2006). Another tool as the behavioral pain assessment scale for young children and infants.

Also, for people with dementia there are many tools designed to assess pain have tended to use some or all of the six behaviors that identified by the American Geriatric Society, which includes verbalization, body movements, facial expression, changes in activities of living, interaction and mental status. Another pain assessment tool for patients with dementia and other cognitive impairments is the abbey pain scale contains six items, producing a score ranging from 0 to 18 (Abbey et al., 2004).

There are other several types of pain assessment tools such as the McGill Pain Questionnaire is useful for research or audit purposes. Also, the Burn Specific Pain Anxiety Scale (BSPAS) it is an instrument to assess anticipatory anxiety in burn patients.

In 2012 a group of health care specialists and expertise in clinical practice and researcher in pain assessment and management reviewed modern pain literature and clinical practice protocols, so the committee agreed to screen all patients for pain regularly by asking about the presence of pain. Pain terminology usually used by the patients to describe the pain such as the use of the word “hurt”, “discomfort” and “ache” should be assessed, and this term used in the continuing assessment, and screening should occur at first contact and be repeated as needed depending on the client's status, care goals, setting and other related. as well as the pain assessment must be considered as the fifth vital sign (Grantham & Brown, 2012).

2.5 Pain measurement scales

Pain is sometimes termed as the 5th vital sign and nursing assessment of pain is essential for better pain management. Commonly used tools are numerical rating scale, VAS and behavioral pain assessment scale. VAS can be used for both adults and children who can express themselves where score 0 is having no pain, 1-3 is mild pain, 4-6 is moderate pain and 7-10 is Severe pain.

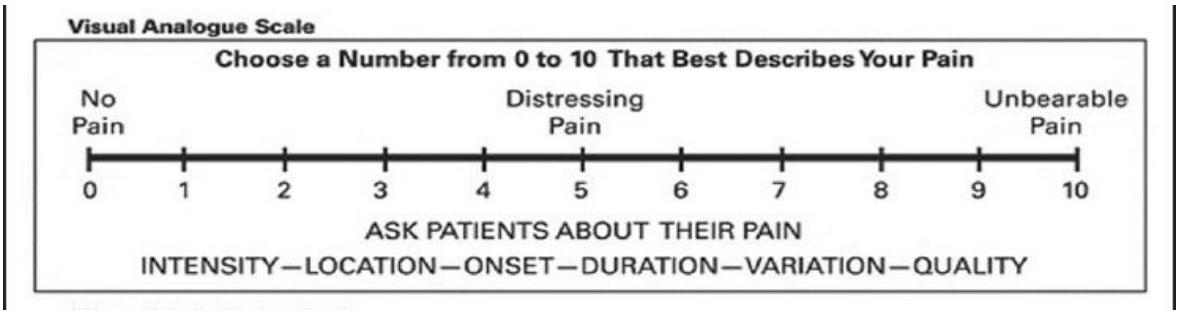

Figure 2: Visual Analogue Scale

Face Pain Rating Scale is often known as Wong-Baker FACES Scale that use of patient drawing faces to identify level of pain they feel. The faces are connected to numbers on a scale ranging between 0 and 10 or from 0 to 5. This scale is most commonly used with children, and is appropriate to use with patients aged four and older (Health Care Association of New Jersey, 2017; WHO, 2012).

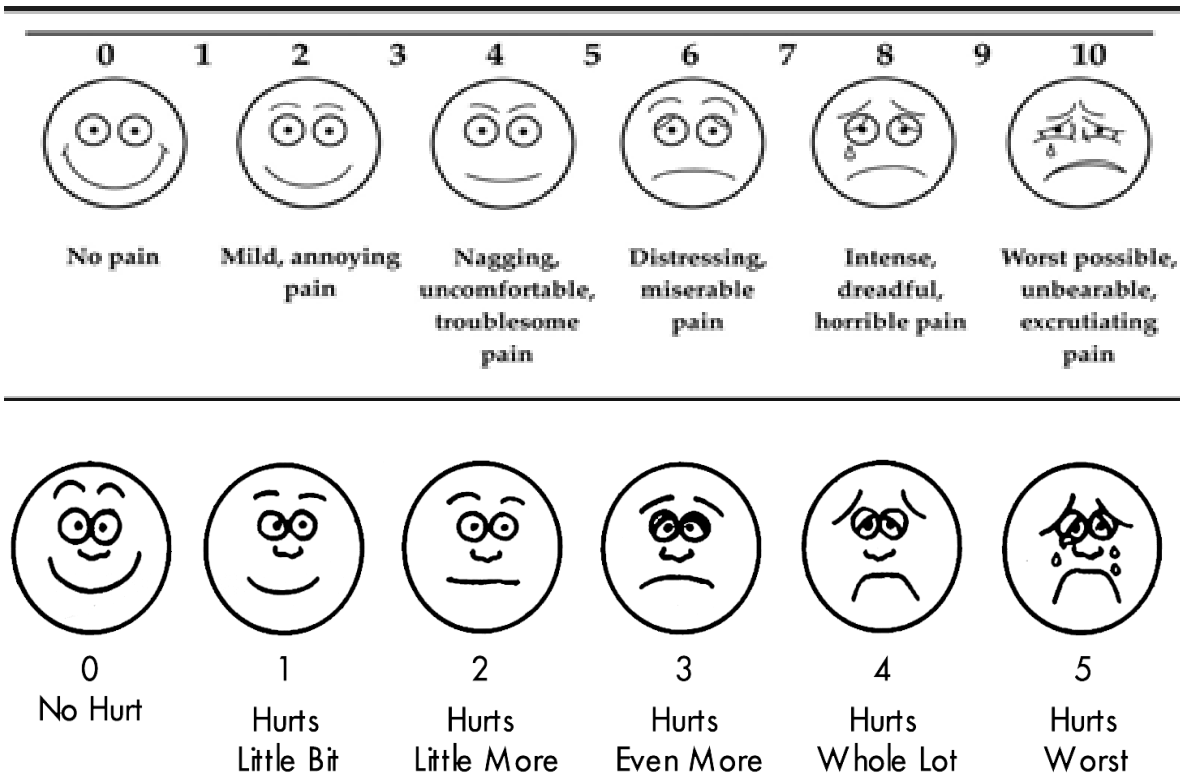

Figure 3: Face Pain Rating Scale

For patients who are not able to provide a self-report of pain, Behavioral Pain Assessment Scale can be used, it is also known as FLACC scale and it's abbreviation for Face, Legs, Activity, Cry, and Consolability. This scale is focus on observation of patient's behaviors, and usually used for child patients who have less than three years of age. The patient's behaviors that are observed associated with numbers; total components are ranging from 0 to 10. This scale is appropriate with patients who have growth delays and with non-verbal communication patient (annex 4).

2.6 Management of burn pain

Pain management refers to the appropriate treatment and interventions developed according to the result of pain assessment, and should be established in partnership with the patient and family. Strategies are formulated to achieve the patient's goals of pain

management based on previous experiences with effective and non-effective therapies. Considerations include type of pain, disease processes, risks, and benefits of treatment modalities. Pain management strategies include pharmacological and non-pharmacological approaches (American Burn Association, 2017).

2.6.1 Pharmacological pain management

Pharmacological interventions are the cornerstone of pain management. Common pharmacological agents for managing the pain include local anesthetics, non-steroidal anti-inflammatory drugs (NSAIDs), acetaminophen, opioids, anxiolytics, and sedatives. Some especially harmful and painful procedures may benefit from the use of local or general anesthesia. Excessive concern about addiction and regulatory scrutiny heavily contribute to the under treatment of pain. Several factors should be considered when selecting appropriate pharmacological agents for patients who are in pain, including the type and length of the procedure, the degree of burn, the intensity of pain, age of the patient, accessibility to pharmacological agents and techniques, and availability of skilled personnel to administer and monitor the effects of the selected pharmacological interventions (Tobias & Deshpande, 2004).

In 1997 the American Pain Society (APS) and American Academy of Pain Medicine issued a consensus statement regarding the use of opioid medications for chronic pain stating that narcotic analgesics are an essential part of a pain management plan (Olsenet al., 2016).

Opioids alone are seldom sufficient for pain control, so there are multi-modality approach includes the use of opioids and non-steroidal anti-inflammatory, anxiolytic and alternative drugs. Ketamine has been found to be a useful agent for analgesia in burn-wound patients; a dose of 10 mg/kg was found to be an effective adjunct to pain therapy (Joubert, 1998).

A combination of ketamine, tramadol and dexmedetomicline has been found to be a safe and ideal treatment option for the prevention of pain suffered by adult patients during dressing changes (Zor et al., 2010).

Morphine, a classical model of opioid has been identified as one of the drug of choice for burn pain management but there are reports of underutilization of the medication and consequent poor pain management have been reported. Nurses play an important role in

successful burn pain management, therefore they should have a positive perception, clear and strong knowledge base on pain management (Bayuo & Agbenorku, 2015).

Currently, ”pain ladder” is used as a guideline in the management of pain according to WHO. The recommendation of the WHO guidelines prescribes immediate oral drug administration when pain occurs, starting with non-opioid drugs such as acetaminophen, metamizole and NSAIDs if the patient has not severe pain. After that, if full pain relief is not obtained or disease progression requires more aggressive treatment, a mild opioid such as dihydrocodeine, codeine phosphate or Tramadol are will be applied to the existing non-opioid regime. If this is or becomes ineffective, a mild opioid will be substituted by a stronger opioid, such as morphine, diamorphine (heroin), fentanyl, hydromorphone, buprenorphine, oxycodone or oxymorphone, while continuing the non-opioid therapy, rising the opioid dose until the pain free or at the maximum possible relief without intolerable side effects. If the initial presentation is severe pain, this steps should be skipped and a strong opioid in combination with a non-opioid analgesic should be started immediately (Sykes et al., 2008).

Opioids are one of the most commonly used and effective types of drugs used to treat moderate to severe pain, by inhibition of neurotransmitter release and hyperpolarize the cell membrane. In other words, activation of opioid receptors suppresses neuronal activity. Morphine, fentanyl, and hydromorphone, used for moderate to severe pain, are also common examples of more powerful opioids. Moreover, the NSAID act by inhibiting cyclooxygenase enzyme responsible for the production of prostaglandins hence anti-inflammatory action on tissues. These drugs include: Aspirin, Ibuprofen, meloxicam, diclofenac among other drugs in this category (Kiplagat, 2013).

2.6.2 Local treatment of pain management

Covering open wounds with dressing reduces burn wound pain and early debridement of wounds and applying Skin Graft reduce pain and mitigate the need for long and painful treatment. Moreover, application of synthetic wound dressing such as vapor-permeable adhesive films, hydrogels, hydrocolloids, alginates, synthetic foam dressings, silicone meshes, tissue adhesives, barrier films, and silver- or collagen-containing dressings that can decrease or remove of pain at the wound site.

2.6.3 Non pharmacological pain management

The use of non-pharmacologic measures has supported effectively in the management of burn pain. These measures include physical and psychological methods for burns patients. Physical methods consist of limb elevation and minimize the number of dressing changes, while psychological methods consist of increase patient awareness, distraction, virtual reality, hypnosis, deep relaxation, imagery, air conditioning, music therapy, spiritual therapy, and integration with the Quran.

Non pharmacological approaches to acute and chronic pain management should supplement, but not replace, analgesics. Rapid induction analgesia had an impact on pain perception, anticipatory anxiety and relaxation state during and after burn care. Music therapy has gained interest recently in the treatment of pain.

Researchers of burn found that music influences both the physiological and psychological aspects of the pain experience. Music distracts the patient from the unpleasant stimulus; offers the orientation of reality, relaxation and sensory stimulation (de Jong et al., 2007).

The use of spiritual pain management by concentrating on a word or idea that promotes tranquility such as reading Quran is suitable non- pharmacological strategy for reducing the pain (Mohammaditabar et al., 2012). There are other types of non-pharmacological pain management as heat and cold, acupressure, acupuncture, transcutaneous electrical nerve stimulation and placebo.

Distraction therapy was found to be an effective way to reduce discomfort in both children and adults during painful procedures. Distraction therapy is relatively new alternative therapy, the virtual reality was found to produce greater reductions of pain than other forms of distraction, such as T.V., music listening, or playing games (McSherry et al., 2018).

Also, a study was conducted in Germany about the efficacy of non-pharmacological interventions for procedural pain relief in adults undergoing burn wound care. The authors through a comprehensive literature search in several electronic databases and 21 eligible randomized controlled trials were included, involving a total of 660 patients. Random effects meta-analyses showed significant positive effects on the outcome of pain. Also the distraction interventions, mainly those using virtual reality, and hypnosis have the greatest

effects on pain relief. In addition, non-pharmacological treatments have had an important, homogeneous impact on the reduction of anxiety (Scheffler et al., 2017).

The virtual reality is a successful non-pharmacological non-invasive analgesic alternative tool for pain management for patients suffering from burns receiving wound dressing changes or physiotherapy treatment (Morris et al., 2009).

In 2017 a study titled a virtual reality for management of pain in hospitalized patients: results of a controlled trial revealed that the use of virtual reality with in-patients reduces the pain significantly versus a control distraction condition. This results showed that virtual reality in the acute inpatient setting is an effective and safe adjunctive therapy for pain management (Tashjian et al., 2017).

Also, Hypnosis is effective method in decreasing background pain quality and pain anxiety of patients with burns (Jafarizadeh et al., 2018).

Although important of non-pharmacological methods in pain control, there was a widespread of underutilization of non-pharmacologic therapies to control patients pain (Jiang et al., 2001).

2.7 Barriers for management of pain

Health care providers for burn patients face unique challenges, including the repeated infliction of pain on patients who already have been traumatized, with therapeutic procedures, physiotherapy, and hygiene that can cause pain and distress (Richardson & Mustard, 2009).

Specific coping mechanisms used by burns health care provider to distance themselves from the discomfort and pain of patients are considered one of the obstacles to effective pain management. In the case of children who are afraid of repetitive potentially painful procedures, a major obstacle to health care providers is mistrust will be found.

In the 1990s, national health associations including the APS and the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) addressed the widespread problem of inadequate pain management (Gordon et al., 2005; Pletcher et al., 2008).

The APS published a consensus statement for the management of pain in 1995 and updated it in 2005. They invite for appropriate assessment, multidisciplinary care planning, and

efficacious therapy, affordable therapy, patient-centered, timely, culturally appropriate, safe, and equitable (Gordon et al., 2005).

The standards adopted by the JCAHO in 2001 require that continuing education for health care providers and patients, pain assessment during hospitalization, planning for patients discharge that includes pain management, and quality management system that measure progress (Pletcher et al., 2008; Rupp & Delaney, 2004).

Despite the increased assertiveness on pain management and the application of formal pain management protocols and standards, a large number of patients continue to experience intolerable levels of pain (Bill, 2008).

In 2018, a study was conducted to identify the knowledge and attitudes of nurses, and barriers and facilitators to effective pain assessment and management in infants and children. The study shows that the obstacles to effective pain control include the lack of pain awareness and assessment tools, unwillingness of patient's parent to report pain and inadequate analgesia prescription by the physicians (Alotaibi et al., 2018).

Therefore, the researcher believes that the lack of availability of the recommendations of the committees and institutions that interested in the management of pain is one of the obstacles to effective pain management, the most important of which is the lack of pain management specialist and lack of knowledge or fear of the side effects of narcotic drugs, as well as the fear from patient addiction to those pain killer medications.

2.8 Compliance with Burn pain management protocols

There is a scarcity of studies about compliance with burn pain management protocols, but there are other studies took about pain management for post-operative, cancer and non-cancer patients, etc. Even though most of the research has focused on compliance or adherence to medication, adherence also encompasses numerous health-related behaviors that extend beyond taking prescribed pharmaceuticals (WHO, 2003).

The WHO has identified the outlines of the compliance definition, and left the possibility for researchers to adapt it according to the research topic with maintaining these outlines. For that, in the light of the WHO definition of compliance, the researcher defined compliance in this study as *"the extent to which medical staff's behavior and practice corresponds with agreed recommendations according to burn care protocol"*.

Based on the researcher's exploration, many studies have shown that there are low rates of compliance in the application of protocols for pain treatment and palliative care in various medical fields.

In 2019, a study conducted in Canada to examine a case series of 70 disability claimants who were referred to a clinic for multidisciplinary medical evaluation for physician compliance with cannabis prescription guidelines. A retrospective case series analysis was done and the results showed that treating physicians have not adhered to the guidelines in 53 of 61 patients (86.9%) who were prescribed cannabis products for pain management and in 8 of 9 patients (88.9%) who were prescribed cannabis products for treatment of PTSD. The prescriptions were found to be consistent with prescription guidelines in just 12.9% of cases. Conclusion: Very few of the reviewed cannabis prescriptions were found to be consistent with cannabis prescription guidelines (Elias et al., 2019).

Also, another study was conducted to assess the awareness, adherence, and obstacles of low back pain clinical practice guidelines, this study revealed that there was (27.5%) of the respondents adhered to guideline, and (78.8%) of them were aware to guidelines (Akindele et al., 2019).

In the Netherlands, a pain management protocol was implemented in the neonatal intensive care unit in 2005 including individual pain assessments and pain treatment guidelines with a decision tree. This protocol was studied in 2015 to evaluate the degree of compliance of medical and nursing staff with the pain protocol for 732 patients illustrated that their (90%) of patients were not receiving optimal assessments per day according to 2005 protocol, and (11%) of patients had not been assessed at all. And the compliance rate to standard pain assessments was suboptimal about 60.2% (Aukes et al., 2015).

In 2007, improving prescription in palliative sedation: compliance with Dutch Guideline study conducted for 1464 physicians to determine compliance to the guiding principle for palliative sedation for two guidelines published in the Netherlands in 2002 and 2003 revealed that there was 43% of physicians did not compliant to guidelines. These percentage need more efforts such as; knowledge of the guidelines and better use for it. Also, need higher participation of consultation teams to increase the adherence level (Hasselaar et al., 2007).

There are many factors may affect the adherence of medical staff to apply the protocol of pain management in patients with burns. In this current study, five basic domains were studied, which consist of many variables. The first domain is socio-demographic characteristics of the study participants include age, gender, qualification, years of experience and job title. The second domain is the knowledge level and practice, which includes the level of knowledge about the presence of a Palestinian protocol for pain management as well as the level of knowledge of pain assessment tools, also the level of knowledge of narcotic and sedative drugs. The third domain is training which contains formal and informal training. The fourth domain is a supportive system includes job aids, supportive policies, and supportive work design. Finally, the fifth domain is the availability of a multidisciplinary medical team, including burns and plastic surgeons, anesthesiologists, nurses, pharmacists, physical and occupational therapists, nutritionists and psychosocial experts.

2.8.1 Socio-demographic characteristics of health care providers

Some of the previous studies showed that there is unclear relation between socio-demographic characteristic such as; (age, gender, and educational status) and adherence of health care provider with pain management guidelines (Lenoir et al., 2019).

The study of Lenoir et al. in Belgium 2019 which conducted in a university hospital of Ghent and Brussels for 120 participants which selected randomly to check the relation between socio-demographic factors, and severity of pain with the degree of clinic-based therapy compliance in patients whose suffering from unspecific spinal pain for a long time. This study revealed that there was not a significant relationship between sex, age and education with adherence in the total sample group, education was related with attendance of at least 50% of the therapy sessions (Lenoir et al., 2019).

Another cross-sectional survey was conducted for 189 participants in Nigeria to determine the awareness level, compliance level, and barriers to compliance to low back pain management clinical practice, this study showed that there were no significant relationship between age, certification courses, and place of practice with adherence guideline ($p = .90$, $\chi2 = 0.72$), ($p = .476$, $\chi2 = 0.508$), ($p = .380$, $\chi2 = 0.845$) respectively, and there was a statistical significant between specialization, and awareness with adherence guideline ($p = .009$, $\chi2 = 16.725$), ($p = .003$, $\chi2 = 8.957$) respectively. The researcher conclude that some

of the participant's characteristics effect on compliance with the management of low back pain clinical practice guideline (Akindele et al., 2019).

2.8.2 Knowledge

The Palestinian MOH has been keen to publish and distribute "Palestinian National Protocols for Burns Care and Management" in order to improve knowledge and practices of the management of burns among health care provider since 2012.

After an in-depth exploration of the literature by the researcher, it was found that the lack of knowledge in pain management among medical professionals is a prominent fact in most previous studies.

The study was conducted in Ghana on twenty young nurses who had been working in the burn unit to determine the nurses' perceptions and experiences regarding the use of morphine in the management of burn pain, this study revealed that there is a good nurses understanding intensity of pain, but prefer paracetamol, diclofenac, and pethedin rather than morphine because of fear of addiction that may causes death. The researcher explained that the results are due to the lack of knowledge on the optimal use of medications and their effects, and the nurses need more education about medication, especially morphine which have useful effects on the management of burn pain (Bayuo & Agbenorku, 2015).

In general, doctors have good knowledge of cancer pain control, but they have deficit knowledge as well as the nurses especially for opioid administration or alternate medications for pain control, these exaggerated due to fear of addiction and respiratory suppression (Xue et al., 2007).

This lowering in knowledge level usually appeared when physicians calculated opioid dosages for pain management and when make an effort to select the right response to challenging clinical vignettes (Breuer et al., 2011).

Insufficient knowledge and incorrect attitudes among doctors and nurses were reported by other studies. A survey included 1,204 physicians from all specialties found that the majority of doctors were not aware about analgesics, opioid dosages, and the numeric rating scale (Kim et al., 2011).

Jho et al., 2014 evaluate awareness, practices and perceived barriers regarding cancer pain management among physicians and nurses in Korea. A total of 333 questionnaires were analyzed for physicians and nurses. The authors showed that the nurses carried out pain assessment and documentation more than did doctors. While doctors had better pain management knowledge than nurses did, but the both of them lacked knowledge about the adverse effects and opiates pharmacology. As well as doctors and nurses working in the palliative care department and who had received pain management training program attained higher scores on knowledge. They conclude that there were variations in knowledge and practices between doctors and nurses regarding cancer pain management. An effective educational strategy for cancer pain management is required to improve the knowledge and practices of health care providers.

In New York, a study for evaluation the attitudes, knowledge, and practices of medical oncologists for cancer pain management. A questionnaire was sent by email to a group of randomly selected medical oncologists from the master file of the American Medical Association. The researcher's show that the most significant barriers to pain control are inadequate assessment, patient unwillingness to report pain or take opioids. Another barrier is excessive regulation of opioid drugs prescription. They conclude that the treatment barriers or limitations in pain-related knowledge and practice (Breuer et al., 2011).

2.8.3 Training

Training is defined as "*a planned process to modify attitude, knowledge, skill or behavior through learning experience to achieve effective performance in an activity or range of activities"*. Its aim is to improve the individual's skills and to satisfy the organization's current and future needs (Peter, 2005).

This concept links training and planning process with training as a planned operation aimed at changing skills through the applying of experience and education. Training is an ongoing planned process that replicates many of the task's stages to achieve the expected benefit.

Jouda, 2018 evaluates the effects of in-service training programs and their contribution in the improvement of the nurses' performance in GG. He studied 185 nurses who had participated in training programs and employed in the governmental primary health care centers. The study illustrated that the mean of the study dimensions was (3.809= 76.18%)

for all domains indicating that their perception is good about the training programs. The highest mean was about "effects of training programs" domain (4.01= 80.22%) revealed that the general perception of this domain was positive, and the lowest mean was "training environment" and the role of the institution regarding training. This implies that the providing of training was conducted in not interested training environment, and inadequate support of the administration regarding the managing, monitoring and follow up of the training programs. The study results revealed that there are no statistically significant differences in all the study domains regarding to gender, marital status, age groups, nurse's qualifications, job title and years of nurse's experience. The researcher recommended that the policy makers at the primary health care should pay more attention and do more effective efforts in the follow-up and the monitoring of training programs and give priority to the assessment and the evaluation of the training programs.

According to Ghana study listed above, the study illustrated that 70% of participants reported that they had not completed any training program or pain management workshop and that such courses may need to be established to help strengthen their knowledge base, which will definitely affect their compliance with burn pain management (Bayuo & Agbenorku, 2015).

In 2015, a systematic descriptive analysis of peer-reviewed articles published between 2000 and 2014 studied nurses' knowledge and attitudes to pain assessment. Seven online electronic databases were explored. All of the researches contained 5 basic domains; one of them is training and education. The study highlighted that the accessibility of special training, stable and constant workforce and a standardized pain assessment approach are key to successful pain management. It also revealed that the absence of training is considered an obstacle to effective pain assessment. To achieve success, strategies such as on-the-job training programs, educational facilitators, communication templates and guidelines for pain management should be further investigated and adopted in clinical practice was recommended (Burns & Mcilfatrick, 2015).

2.8.4 Supportive system

It is a set of things that are essential for a system supporting. According to our study, compliance with burn pain management protocol, these are the support of administration through supportive policies and monitoring, supervising, evaluating compliance with the

protocol, as well as the availability of the multidisciplinary medical team. In addition to the medical supplies "job aids" especially that listed in the protocol.

According to Jouda's study about evaluating the effects of in-service training programs and their contribution in the improvement of the nurses' performance in GG, the study showed that inadequate support of the administration regarding the managing, monitoring, supervision and follow up (Jouda, 2018).

According to the study in 2017 about assessment and management of burn pain: a best practice implementation project to enhance adherence to guidelines. The researchers studied ten evidence-based audit criteria and adopted baseline audit in a convenience sample of ten patients from the first to the seventh day of admission. After the strategies have been applied, the authors showed poor compliance to the best practice project. Nonetheless, following the implementation of strategies, including continuing in-service education and providing assessment tools and protocols, the adherence level significantly improved. So they conclude that improvement of pain management practices in the burns unit by the end of the project reflecting the importance of an audit process, training, providing feedback, successful efforts and effective teamwork (Bayuo et al., 2017).

The researcher sees that all of the previous items demonstrate the essential and effective role of administration in protocols implementation and activating auditing system to ensure the compliance.

2.8.5 Multidisciplinary medical team

Care provided in the burn units which has designated to promote a teamwork approach has demonstrably better-quality of health for burn patients. Multidisciplinary activities are essential to ongoing improvements and rehabilitation understanding and physiological, psychological and emotional recovery of burn patients. Huge advances in science and technology have led to dramatic increases in the survival of burn victims (Cambiaso-Daniel et al., 2018).

It is important to better understanding the experience of burn patients and identifying the factors responsible for the pain under-treated and establishing an effective pain management team.

According to the Palestinian national protocol for burn care and management, the multidisciplinary medical team consists of a physician, surgeons, anesthesiologists, intensivists, nurses, nutritionist, physiotherapists, psychosocial worker, and others.

In 2019 a study was conducted to determine whether a quality improvement project can increase compliance with pain, agitation, and delirium (PAD) protocol for improving patient outcomes. The authors used chart audits to determine baseline compliance, and measure the uses of the PAD protocol, and assess the type of medication given to each patient with mechanical ventilation. A multidisciplinary, multidimensional learning curriculum was developed and implemented by using the knowledge-to-Action model framework. An evaluation was performed after three months to assess whether improved compliance with protocol was achieved. The study revealed that the implementation of a multidimensional, multidisciplinary program was successful in increasing adherence to the management of the PAD clinical practice guidelines (Yan et al., 2019).

Another study was conducted in China to examine and identify the patient's experience of burn-injury pain during hospitalization. The study result recommended that patients who suffer from uncontrolled physically and psychologically pain that may serve as an alert for awareness of health care providers to identify and create a multidisciplinary medical team to deal with burn pain management, including burn surgeons, anesthesiologists, intensivists, nurses, psychologists, and social workers to obtain safe and effective treatment for pain to reach an optimal level of pain management in burn patients (Yuxiang et al., 2012).

A study conducted in GG aimed to evaluate health services provided at governmental burn units. The sample of the study consisted of all cases of burns admitted in two burn units during the year 2014 were 458 burn patients and 52 health care providers who are working in both burn units. For data collection, the researcher used a checklist for facilities and services, a questionnaire for health care providers and focus group discussions with a health care provider. The results revealed that the health facilities and services were 57.1% were available in burn units of Al Shifa and 42.8% were in Naser hospitals. For the multidisciplinary team, nearly two-third of multidisciplinary team elements were unavailable in burn units of Al Shifa and Naser hospital. The study recommended that

recognizing burns services as a priority area needs more support, also a multidisciplinary team approach to burn care services is among areas need attention and need to employ adequate qualified physicians and nurses to offer quality care to burn patients (Abdel Rhaman, 2016).

Chapter Three
Methodology

In this chapter the researcher describes the methodology which was used in the study, it started by the selected design of the study, study population, study setting, study period, eligibility criteria; (inclusion and exclusion criteria), study instrument, pilot study, validity and reliability, data entry and analysis; (quantitative and qualitative parts), ethical consideration, and ultimately anticipated limitation of the study.

3.1 Study design

The study is a descriptive, cross-sectional, quantitative and qualitative (triangulated) design. A descriptive design is used to assess the problems in a defined population, and cross-sectional design reflects the characteristics of a population at one point in time or over a short period (like a photo "snap shot") of data collection (Sedgwick, 2015).

Also, it is easy to use, relatively quick and easy to conduct, and data on all variables is only collected once (all factors; exposure, outcome, and confounders are measured simultaneously). So in the cross-sectional design, it is suitable to study multiple outcomes and exposures (Eale, 2015).

On the other hand, the cross-sectional design has weak points as it difficult to determine whether the outcome followed exposure in time or exposure resulted from the outcome (temporality issue) and it's only a snapshot: the situation may provide differing results if another time-frame had been chosen, as well as the associations identified may be difficult to interpret (Eale, 2015).

In this study, triangulation methodology was used and provided combination between quantitative (structured interview questionnaire with open and closed-ended questions and two checklists) and qualitative models (in-depth Key Informant Interview for health care providers) to confirm outcomes from one model with another, and to maximize the strengths of the quantitative and qualitative. Also, to add new facts having an important relation to the study, and ultimately to provide a better understanding of the research problem or issue than understanding research approach alone (Bulsara, 2015).

3.2 Study setting

This study is conducted only in the two governmental hospitals which have burn unit; (Al Shifa Medical Complex, Naser Medical Complex).

3.3 Census

The study population targeted all of the medical staff, doctors and nurses, who are working at the Adnan Alalami Burn Center in Al Shifa Medical Complex and Burn Department in Naser Medical Complex, and the study population of both burn units in governmental hospital included in the study was 59 participants, with a response rate of 89.8%.

3.4 Study period

The study was carried out from Jun 2018 to Nov. 2019. Data collection took place from Jan. to Feb. 2019. Annex 5 describes the activities of the research and the duration for each activity.

3.5 Eligibility criteria

3.5.1 Inclusion criteria

Selection of participants

All the health care providers, doctors and nurses, who are working in both burn units Al Shifa Medical Complex and Naser Medical Complex, and who have been employed for more than six months including permanent contract and volunteers.

Selection of patients' files

Files were selected based on patients who were admitted to the burn department in January and February 2019.

3.5.2 Exclusion criteria

1- All health care providers who are newly employed with less than six months.
2- Others health care providers rather than doctors and nurses.
3- Files of patients who admitted before or after the period of data collection.

3.6 Study instruments

3.6.1 Quantitative Part

The researcher used three instruments. The first tool is a structured interviewed questionnaire. The questionnaire was based on Palestinian national protocols for burns care and management, and medical staff experience. The majority of the questions that were included in the questionnaire were either multiple-choice questions, which give several alternatives Likert scale questions (yes, no, I don't know) and open-ended questions.

The questionnaire consisted of seven domains; these domains were organized according to:

1. Personal and professional information.
2. Level of knowledge of medical staff about burn pain management protocol.
3. Training on protocols for medical staff.
4. Availability of supportive system.
5. Availability of multidisciplinary team.
6. The Possible obstacles for compliance with application of pain management protocol.
7. The suggestions for improving the commitment of staff to implement the protocol.

The second and third instruments used in the study for data collection from the patient files and physical environment in the burn unit respectively was a checklist.

3.6.2 Qualitative part

The fourth instrument used in the data collection was an in-depth interview (qualitative part) for five key informants; it was designed according to the expertise, context and internal-external burn environment, and questionnaire domains.

Table (3.1): Data collection and Study instruments

	Instrument	**Target group**	**Number of participants**
1	Questionnaire	Medical staff	59
2	Compliance checklist	Medical file	89
3	Physical environment Checklist	Medical staff	2
4	In-depth interview	Key Informant Interview	5

3.7 Validity and reliability

3.7.1 Quantitative part (questionnaire)

Validity

The validity refers to the ability of the instrument measures what it intends to measure (Polit & Beck, 2010). To check the appropriateness of the questions (clarity and wording), the questionnaire was examined by a group of 10 experts in public health, medical specialists doctors and nurses, researchers and key informants working in MOH and universities to validate the content and relevancy of the questions. Their comments and recommendations were considered in finalization of the questionnaire (annex 6).

Reliability

The reliability of the questionnaire was tested with an accepted reliability coefficient of not less than 0.7 immediately after data cleaning and Cronbach Alpha test. The following steps were done to assure instrument's reliability:

- Continuing checking and confirmations of the completed questionnaires.
- The data were entered on the same day of data collection which allowed possible interventions to check the data quality or to re-fill the questionnaire when required.
- Re-entry of 5% of the data after finished the data entry to assure correct entry procedure and decrease entry errors.

Table (3.2): Reliability Statistics (Cronbach alpha test)

	Percentage Coefficient	No. of Items
Cronbach Alpha	0.712	8

3.7.2 Qualitative part (in-depth interviews)

The following was done to assure the trustworthiness of the qualitative part in this study. First, a peer review was conducted by health experts to revise the questions to assure that they covered all the required dimensions. Then, a member check was done to assure the accuracy and transparency of the transcripts during the interview. Prolonged engagement was done as the researcher tried to probe for answers and covered all the interview

dimensions properly. In addition, recording the interview enhanced tracking up facts and re-checked the accuracy of the transcripts. Finally, all the transcripts and recordings were kept for tracking the information with others at any time.

3.8 Pilot study

The pilot study was done on 5 doctors and nurses from the health care providers in burn unit prior to the beginning of data collection. A pilot study was conducted before the actual data collection to examine participants' responses to the questionnaire and how they understand it. Also, a pilot testing of the questionnaire helped to determine the time that participants took in responding to the questionnaire, which was determined to be on average of 20-25 minutes. No changes were done on the questionnaire after piloting. Therefore, these questionnaires were included in the study.

3.9 Data collection

3.9.1 Quantitative part:

The researcher used a structured interview questionnaire as a formal instrument for data collection. The formal instrument was used for validity and reliability testing to ensure scientifically sound findings. The researcher asked and explained the nature of all questions for the participants distributed among two burn unit which located in main the Governmental hospital (Al Shifa medical complex and Naser medical complex).

In addition, the attached consent form was placed in front of each questionnaire and the participants were asked to voluntarily participate in the study. The researcher explained to each participant the importance, the aim and purpose of the study, and then ticked all questions that were answered by the participants. Time allocated for each questionnaire was 20–25 minutes (annex 7 and 8).

The questionnaire consists of seven domains:

1-The first domain is socio-demographic information, which included 7 questions on personal information.

2-The second and third domain is the level of knowledge and training of the medical staff which included 31 questions.

3-The fourth and fifth domain contains questions about availability of supportive system and multidisciplinary team, and includes 4 questions.

4-The sixth domains contain one open question about the possible obstacles for compliance with the protocol.

5-The seventh domain contains one open end question about suggestions for improving compliance with the protocol.

Also, the researcher used a compliance checklist which contains 17 yes/no questions for measuring the compliance rate in the study. The compliance checklist consists of two sections: the first one is the patient's data as the workplace (Burn unit in…), file number, patient age, conscious status and level of pain. The second one is the procedures that must be followed by patients with pain as prescribed in the protocol. The filling of the checklist depends on the patient's consciousness level and pain severity. The researcher reviewed 89 medical files of patients who were hospitalized in the unit, after filling the checklists the researcher calculates and attested the compliance level on the SPSS program (annex 9).

In addition, the researcher used another checklist, assessment checklist of physical environment, which contain 8 yes/no question to assess the appropriateness of the place, the availability of instruments and medical supplies, the availability of multidisciplinary team and supervision role (annex 10).

3.9.2 Qualitative part

In-depth interviews with five key informant interviews (KII) from health care providers "doctors and nurses" were done. The researcher gave a brief introduction to the aim of the study, prolonged engagement and probing techniques were used to make sure that ideas are reasonably reflected. In addition, short notes were taken and recorded through the interviews to allow further capturing of information, each interview lasted from 40 to 50 minutes. Interviews were conducted after the quantitative data collection was completed. Annex 11 and 12 show the questions discussed and the KII who participated in the study.

3.10 Data entry and statistical analysis

3.10.1 Quantitative part

The researcher entered and analyzed the data by using Statistical Package for Social Sciences (SPSS) version 23. Descriptive analysis such as mean, median, standard deviation and cross-tabulation for "i.e. age and gender". Also, T-test and P-values used to calculate the statistical significance of the findings equal or less than 0.05 for independent variable containing two levels, such as compliance mean scores and health care providers "doctors

or nurses". One Way of Variance (ANOVA) test for independent variables containing more than two levels such as job title and years of experience with knowledge mean scores. In addition to that, some of the data were presented by charts, graphs and frequency tables.

3.10.2 Compliance scoring

The second data collection tool, compliance checklist, was composed of (8) yes/no items to determine the medical staff compliance rate. The items reported to be done were scored "1" and the items not done were scored "0". For all compliance items, the scores of the items were summed-up and the total was divided by the number of the eight items, to get the mean percentage for the compliance domain.

3.10.3 Qualitative part

The researcher obtained the main findings from the transcripts of the key informants through in-depth interviews and note taking. Then, categorization of related ideas, and comparison and integration between the quantitative and the qualitative findings were done to create rich items for discussion and representation.

3.11 Ethical and administrative considerations

An academic approval was asked from the School of Public Health at Al-Quds University through accepting the proposal of the study. Also, an approval to assure compliance with ethical principles was obtained from the Helsinki Committee (annex 13).

In addition, before starting the study the agreement was obtained from Al-Quds University. An official letter was sent to the Palestinian MOH to facilitate the task of the researcher in the study. An administrative approval was obtained for data collection from the Human resources development directorate general in the MOH for conducting this study in the governmental hospitals (annex 14).

To assure the participants' rights, a covering letter indicating that the participation is voluntary and confidentiality was assured for all of them. The participants were asked for their agreement to participate in the study.

3.12 Limitations of the study

There are some restrictions or limitations that faced the researcher in this study as:

- The study population (census) is a small population of 59 participants, so the researcher faced challenges during statistical analysis.
- When reviewing patients' files, the percentage of commitment cannot be linked to the socio-demographic characteristics of health care providers, as the documentation process does not include age, academic qualification, years of experience and other characteristics of the health care providers.
- A structured interviewed questionnaire was expensive and time consuming.
- The scarcity of literature about burn pain management, especially in the Arab world and Palestine.

Chapter Four

Results and Discussion

4.1 Introduction

This chapter demonstrates the results of statistical tests and analysis of data, including descriptive analysis that presents the socio-demographic characteristics and outcomes of the study. Simple and advanced statistics including frequency distribution, Chi square, t-test, and ANOVA test. Finally, the researcher demonstrated the outcomes arising from this study and compared them with other studies.

4.2 Socio-demographic characteristics of participants

Table (4.1): Distribution of study participants according to their demographic data

No.	Items	No.	%
1	**Gender**		
	Male	39	73.6
	Female	14	26.4
	Total	**53**	**100.0**
2	**Age**		
	Less than 30 Years	11	20.8
	From 31 to 35 Years	18	34
	From 36 to 45 Years	12	22.6
	Above 45 Years	12	22.6
	Total	**53**	**100.0**
	Mean = 37.73, SD± = 10.096		
3	**Marital Status**		
	Single	9	17.0
	Married	44	83.0
	Total	**53**	**100.0**
4	**Workplace of participant**		
	Al Shifa Medical Complex	27	50.9
	Naser Medical Complex	26	49.1
	Total	**53**	**100.0**
5	**Job Titles of participant**		

No.	Items	No.	%
	Specialist Doctor	9	17.0
	General Physician	2	3.8
	Staff Nurse	29	54.7
	Practical Nurse	13	24.5
	Total	**53**	**100.0**
6	**Academic Qualification of participant**		
	Doctorate (Ph.D.)	2	3.8
	Master	10	18.9
	High diploma	5	9.4
	Bachelor	23	43.4
	Diploma	13	24.5
	Total	**53**	**100.0**
7	**Years of experience in burn unit**		
	Five Years and less	13	27.7
	From 6 to 10 Years	17	36.2
	From 11 to 15 Years	10	21.3
	Above 15 Years	7	14.9
	Total	**53**	**100.0**

Table 4.1 shows the distribution of participants' characteristics according to their gender, age, marital status, workplace of participants, job titles of the participant, educational level and years of experience in the burn unit.

There are 73.6% of study participants are male, while 26.4% female. Our study agrees with (Ricard-hibon et al., 2008), they found that the male percentage (64%) higher than female (36%) in a study to assess compliance with a morphine protocol and effect on pain relief in out-of-hospital patients. On the other study about improving prescription in palliative sedation, compliance with Dutch physicians showed that the percentage male participants higher than female (Hasselaar et al., 2007).

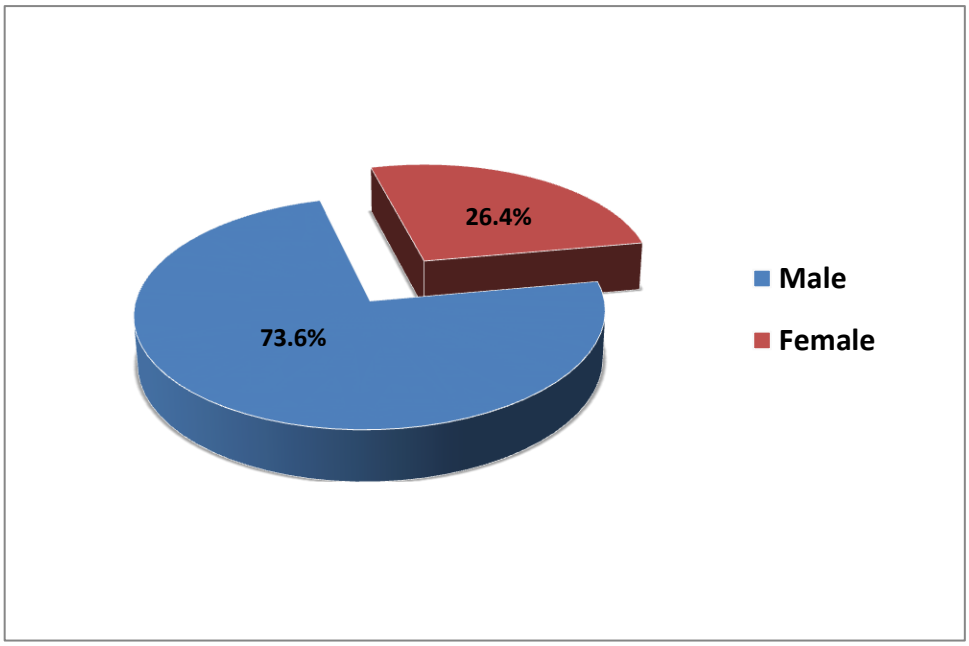

Figure 4: Distribution of the study participants according to their gender

Regarding to age, almost 34% have ages between 31 to 35 years with mean 37.73 years. Our study agrees with (Abdel Rhaman, 2016), (Taira et al., 2010) and (Mosier et al., 2011) they found the prominent age group ranged from 27 to 41 years.

The results also showed that the majority of participants were married with a percentage of 83% and this result is higher than what is reported in PCBS (2019) that 46.6% of participants in the labour force in the GS were currently married (PCBS, 2019).

Around the half of participants (50.9%) work at Al Shifa Medical Complex burns unit and (49.1%) at Naser Medical Complex burn department.

Concerning to job titles of participant, there are 54.7% a staff nurse followed by the practical nurse with percent 24.5%, while 21% of participants are doctors. The percentage of nurses is more than doctors due to the nature of nursing services provided to patients constantly, unlike the nature of doctor's work.

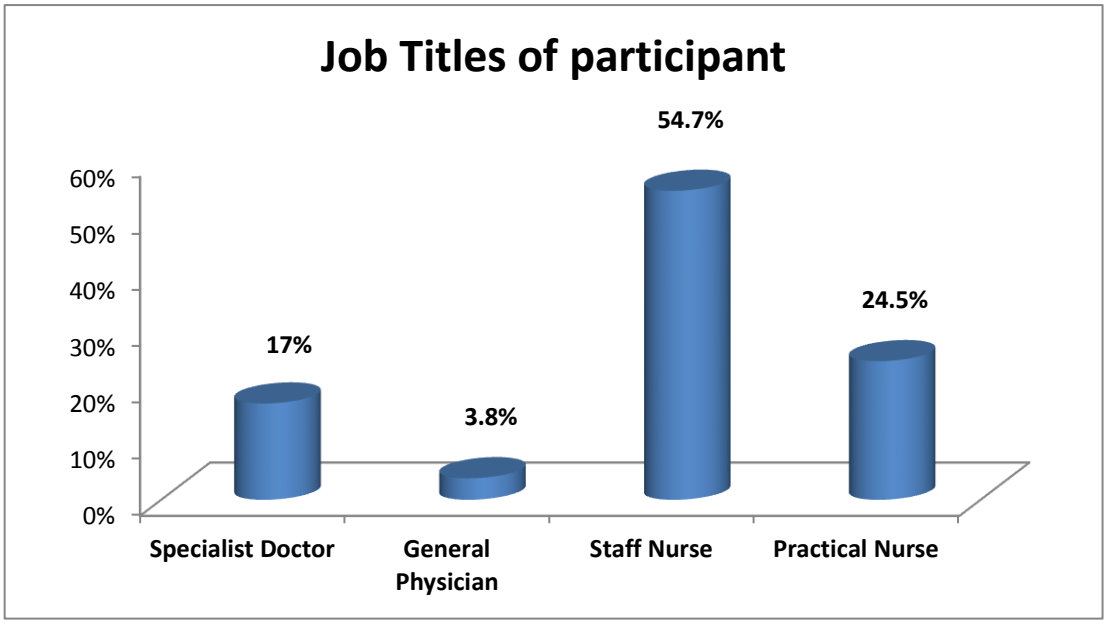

Figure 5: Distribution of the study participants according to their job title

Regarding to the academic qualification**,** 43.4% of the participants had a BSC certificate, while 22.7% postgraduate degree (Ph.D. & Master). Our study consistent with (Abdel Rhaman, 2016) in a study to evaluate the health services provided at the governmental burn units - GG and he found that most of participants have had a BSC degree which constituted 51.1%, while 28.8% of participants have postgraduate degree.

One of the key informants said that *"Some of the health care providers working in the unit of burns have high scientific degrees and highly educated; some of them have a Ph.D. and some have a higher diploma specializing in burn care. There is also a good percentage with a master's degree."*

About the participant's years of experience in the burn unit, the study illustrated that 36.2% of the participants had experience from 6 to 10 years, while 21.9% had experience from 11 to 15 years. Also, our study agrees with (Abdel Rhaman, 2016), he found that most of the participants (51.2%) have experience (5-9) years.

4.3 Knowledge of participants

4.3.1 Distribution of the study participants according to their knowledge about presence of the protocol

Table (4.2): Distribution of study participant according to their knowledge about presence of the protocol

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
8	**Did you hear about the universal standard precautions of burn pain management?**						
	I Don't Know	0	0.0	5	19.2	5	9.4
	No	5	18.5	9	34.6	14	26.4
	Yes	22	81.5	12	46.2	34	64.2
	Total	**27**	**100.0**	**25**	**100.0**	**53**	**100.0**
9	**Are you aware if there are Palestinian national protocols for burns care and management?**						
	I Don't Know	0	0.0	10	38.5	10	18.9
	No	6	22.2	12	46.2	18	34.0
	Yes	21	77.8	4	15.4	25	47.2
	Total	**27**	**100.0**	**25**	**100.0**	**53**	**100.0**
10	**If the answer is YES**, have you seen it**?**						
	I Don't Know	0	0.0	0	0.0	0	0.0
	No	1	4.8	1	25.0	2	8.0
	Yes	20	95.2	3	75.0	23	92.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**
11	**Do you have a copy of the protocol?**						
	No	4	19.0	0	0.0	4	16.0
	Yes	17	81.0	4	100.0	21	84.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**
12	**If there is a copy, where it is?**						
	Supervisor nurse	1	5.9	0	0.0	1	4.8
	Physicians room	4	23.5	2	50.0	5	28.6
	Staff nurse room	2	11.8	1	25.0	3	14.3
	Home	10	58.8	1	25.0	11	52.4
	Total	**17**	**100.0**	**4**	**100.0**	**21**	**100.0**
13	**Did you read it?**						
	I Don't Remember	0	0.0	1	25.0	1	4.0
	No	1	4.8	0	0.0	1	4.0
	Yes	20	95.2	3	75.0	23	92.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
14	**Does the protocol contain the burn pain management?**						
	I Don’t Know	1	4.8	0	0.0	1	4.0
	No	0	0.0	1	25.0	1	4.0
	Yes	20	95.2	3	75.0	23	92.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**
15	**Do you think that the practice of medical procedures in an effort to control patient pain is based on what is stated in the protocol?**						
	No	13	61.9	4	100.0	17	68.0
	Yes	8	38.1	0	0.0	8	32.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**

Table 4.2 shows that 64.2% of the participant hearing about universal standard precautions of burn pain management, distributed by hospital (81.5% Al Shifa, 46.2% Naser), also 47.2% of participant are aware about presence of Palestinian national protocols for burns care and management, distributed by hospital (77.8% Al Shifa, 15.4% Naser), while 34.0% of participants are not aware, and 18.9% of participants are didn't know about the presence of a protocol.

Ninety-two percent of participants who's aware about the presence of Palestinian national protocols for burns care and management have seen it, and 8% haven't seen it. Moreover, 92% of them are read the protocol and they sure that the protocol contains the burn pain management. This is a relatively high percentage compared to a study conducted in New Zealand which showed that 66% of participants read the pain management guidelines (Hendrick et al., 2013).

Also, 84% of them have a copy of the protocol and most of them keep the copy in the home (52.4%). Furthermore, 68% didn't think that the practice of medical procedures in an effort to control patient pain is based on what is stated in the protocol, and 32% think that.

Finally, depending on the previous scores on the knowledge of participants about the presence of Palestinian national protocols for burns care and management sub-domain was 41%.

4.3.2 Distribution of the study participants according to their knowledge about pain assessment techniques

Table (4.3): Distribution of study participant according to their Knowledge about measuring instrument (pain scale) to assess pain intensity

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
23	**Using a measuring instrument (pain scale) to assess pain intensity in patients**						
	I Don't Know	2	7.4	3	11.5	5	9.4
	No	21	77.8	19	73.1	40	75.5
	Yes	4	14.8	4	15.4	8	15.1
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
24	**Do you have knowledge of the visual analogue scale to assess the pain**						
	I Don't Know	4	14.8	3	11.5	7	13.2
	No	9	33.3	15	57.7	24	45.3
	Yes	14	51.9	8	30.8	22	41.5
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
25	**If Yes, Do you know how to use it**						
	I Don't Know	0	0.0	2	25.0	2	9.1
	No	2	14.3	0	0.0	2	9.1
	Yes	12	85.7	6	75.0	18	81.8
	Total	**14**	**100.0**	**8**	**100.0**	**22**	**100.0**
26	**According to the visual analogue scale, the degree of pain from 3 to 6 is considered severe pain?**						
	I Don't Know	1	7.1	0	0.0	1	4.5
	No	8	57.1	5	62.5	13	59.1
	Yes	5	35.7	3	37.5	8	36.4*
	Total	**14**	**100.0**	**8**	**100.0**	**22**	**100.0**
27	**Do you know the face pain rating scale?**						
	I Don't Know	5	18.5	4	15.4	9	17.0
	No	4	14.8	8	30.8	12	22.6
	Yes	18	66.7	14	53.8	32	60.4
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
28	**Do you know how to use it?**						
	No	2	11.1	2	14.3	4	12.5
	Yes	16	88.9	12	85.7	28	87.5
	Total	**18**	**100.0**	**14**	**100.0**	**32**	**100.0**

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
29	**According to the face pain rating scale, this facial shape  indicates mild pain?**						
	I Don't Know	1	5.6	1	7.1	2	6.3
	No	9	50.0	9	64.3	18	56.3
	Yes	8	44.4	4	28.6	12	37.5*
	Total	**18**	**100.0**	**14**	**100.0**	**32**	**100.0**
30	**Do you know the Behavioral Observation Pain Scale**						
	I Don't Know	6	22.2	3	11.5	9	17.0
	No	10	37.0	13	50.0	23	43.4
	Yes	11	40.7	10	38.5	21	39.6
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
31	**Do you know how to use it?**						
	No	2	18.2	1	10.0	3	14.3
	Yes	9	81.8	9	90.0	18	85.7
	Total	**11**	**100.0**	**10**	**100.0**	**21**	**100.0**
32	**According to the behavioral observation pain scale, the degree of pain is assessed by 5 determinants: face, legs, activity, crying, and consolability?**						
	I Don't Know	1	9.1	1	10.0	2	9.5
	No	0	0.0	1	10.0	1	4.8
	Yes	10	90.9	8	80.0	18	85.7
	Total	**11**	**100.0**	**10**	**100.0**	**21**	**100.0**

* Negative question

The table 4.3 shows that the knowledge of participants about pain assessment techniques. 75.5% of participants answered that they didn't use a measuring instrument (pain scale) to assess pain intensity of patients, while 15.1% answered yes they use, and 9.4% answered they didn't know. But after analyzing the second research tool, compliance checklist, it was found that the health care provider never uses pain assessment tools to determine the degree of pain experienced by the patient.

A key informant work as head of a department said that *"Pain assessment tools are not used by the health care providers. While this is done through the complaint of the patient himself that he/she is suffering from pain and depending on the degree or severity of the patient's expression of pain and dealing with him depending on the availability of medicines in the department".*

Another KII mentioned that *"Pain assessment tools are not used to determine the degree of pain in the patient, but the doctor's estimate of the degree of pain according to the patient's complaint or according to the patient's facial expression and accordingly prescribe the type of analgesic or appropriate sedative".*

According to the results, the highest response was paragraph number (32) *"According to the behavioral observation pain scale, the degree of pain is assessed by 5 determinants: face, legs, activity, crying, and consolability?"* with 85.7% of participants, followed by paragraph number (27) *"Do you know the face pain rating scale?"* with 60.4% of participants.

While the lowest response was paragraph number (30) *"Do you know the Behavioral Observation Pain Scale?"* with 39.6% of participants, followed by the paragraph number (24) *"Do you have knowledge of the visual analogue scale to assess the pain?"* with 41.5% of participants.

Finally, depending on the previous scores on this sub-domain, the knowledge of participants about pain assessment techniques was 39.2%.

4.3.3 Distribution of the study participants according to their Knowledge about Medication

Table (4.4): Distribution of study participant according to their Knowledge about Medication

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
33	**If the patient is conscious the pain is assessed every two hours and the treatment adjusted accordingly?**						
	I Don't Know	7	25.9	7	26.9	14	26.4
	No	12	44.4	6	23.1	18	34.0
	Yes	8	29.6	13	50.0	21	39.6
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
34	**In the event that the patient is an adult conscious and suffering from mild pain, he/she is given Paracetamol + Oromorph S.O.S?**						
	I Don't Know	3	11.1	3	11.5	6	11.3

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
	No	6	22.2	12	46.2	18	34.0
	Yes	18	66.7	11	42.3	29	54.7
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
35	**If the patient is a conscious child and suffers from mild pain, Paracetamol 20mg / kg + Oromorph 100 microgram (mcg) / kg are given?**						
	I Don't Know	4	14.8	6	23.1	10	18.9
	No	10	37.0	8	30.8	18	34.0
	Yes	13	48.1	12	46.2	25	47.2
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
36	**If the patient is a conscious adult and suffers from moderate pain, Paracetamol + Oromorph are given regularly?**						
	I Don't Know	5	18.5	4	15.4	9	17.0
	No	14	51.9	8	30.8	22	41.5
	Yes	8	29.6	14	53.8	22	41.5
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
37	**Based on the previous question, if the pain persists, an additional dose of Oromorph Or Ibuprofen Tab is given?**						
	I Don't Know	6	22.2	4	15.4	10	18.9
	No	11	40.7	10	38.5	21	39.6
	Yes	10	37.0	12	46.2	22	41.5
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
38	**If the patient is a conscious child suffering from moderate pain, Paracetamol + Oromorph are given. If the pain continues, Ibuprofen is added?**						
	I Don't Know	4	14.8	3	11.5	7	13.2
	No	11	40.7	8	30.8	19	35.8
	Yes	12	44.4	15	57.7	27	50.9
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
39	**If the patient is an adult and suffers from severe pain, Morphine IV INFUSION is given?**						
	I Don't Know	4	14.8	4	15.4	8	15.1

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
	No	6	22.2	5	19.2	11	20.8
	Yes	17	63.0	17	65.4	34	64.2
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
40	**Is the morphine IV safe and does not affect respiratory rate and blood pressure?**						
	I Don't Know	2	7.4	4	15.4	6	11.3
	No	16	59.3	18	69.2	34	64.2
	Yes	9	33.3	4	15.4	13	24.5*
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
41	**In case of severe pain is allowed to give Fentanyl to adults but not children**						
	I Don't Know	6	22.2	7	26.9	13	24.5
	No	18	66.7	10	38.5	28	52.8
	Yes	3	11.1	9	34.6	12	22.6*
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**
42	**If the patient is an "Intubated", Propofol is given as an anesthetic for patients under the age of 18 years**						
	I Don't Know	8	29.6	14	53.8	22	41.5
	No	9	33.3	7	26.9	16	30.2
	Yes	10	37.0	5	19.2	15	28.3*
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**

* Negative question

Table 4.4 shows the knowledge of participant about medication that controls patients' pain. According to the results, the highest response was paragraph number (39) *"If the patient is an adult and suffers from severe pain, Morphine IV INFUSION is given?"* with 64.2% of participants, equally with paragraph number (40) *"Is the morphine IV safe and does not affect respiratory rate and blood pressure?"*, followed by paragraph number (34) *"In the event that the patient is an adult conscious and suffering from mild pain, he/she is given Paracetamol + Oromorph S.O.S?"* with 54.7% of participants.

While the lowest response was paragraph number (42) *"If the patient is an "Intubated", Propofol is given as an anesthetic for patients under the age of 18 years?"* with 30.2% of

participants, followed by paragraph number (33) *"If the patient is conscious the pain is assessed every two hours and the treatment adjusted accordingly?"* with 39.6% of participants.

Finally, depending on the previous scores on this sub-domain, the knowledge of participants about the medications stipulated in the protocol was 48.7%.

Table (4.5): Health care provider knowledge level about pain management protocol.

No.	Sub-domain of Health care provider knowledge	Mean	MD	SD±
1	Knowledge about presence of Palestinian national protocols for burns care and management	41	35.4	25.0
2	Knowledge about pain assessment techniques	39.2	32.7	50.0
3	Knowledge about Medication	48.7	24.4	50.0
	Knowledge of participants (Total)	**44.9**	**21.8**	**44.4**

Table 4.5 shows, after identifying the percentage of every question for study participants, it is clear that the mean of the first subdomain "knowledge of study participants about the presence of Palestinian national protocols for burns care and management" is 41%, while the mean of the second subdomain "knowledge of study participants about pain assessment techniques" is 39.2%, as well as the mean of the third subdomain "Knowledge of study participants about Medication" is 48.7%.

Finally, depending on the previous result, the health care provider knowledge level about pain management protocol is 44.9% which is low percent and the researcher attributed this to several reasons, including lack of awareness of health care provider about the existence of a national protocol for the care of burn patients, as well as the lack of training of the health care provider on how to use and apply this protocol, in addition to that the lack of follow-up of its application by the administration. Also, the lack of periodic review of the protocol and the examination of its suitability and efficiency, as well as lack of keeping pace of modern scientific research.

Our study showed that the level of knowledge of participants about the existence of a national protocol for burn pain management was below average, and this is not compatible with the study of (Hendrick et al., 2013; López et al., 2018) where the percentage of participants who knows about the presence of pain management guideline is 82.4% and 82% respectively.

Another study inconsistent with our study was conducted in Nigeria showed that a higher percentage (78.80%) of participants was aware of the low back pain management guideline (Akindele et al., 2019).

According to a systematic narrative review of peer-reviewed articles published between 2000 and 2014 examining nurses' knowledge and attitudes to pain assessment, it was found that nurses play an important role in the effective management of pain through the use of pain assessment tools, behavioral observation, and analgesic choice (Burns & Mcilfatrick, 2015).

Also, our study agrees with a study titled nurses' perceptions and experiences regarding morphine usage in burn pain management, it was found that lack of information towards morphine and some participants were unsure about some of the pertinent facts of morphine (Bayuo & Agbenorku, 2015).

Furthermore, our study agrees with a study conducted in Korea highlighted that both groups, physicians and nurses, lacked knowledge regarding pain management guidelines and the side effects and pharmacology of opioids (Jho et al., 2014).

In addition, our study agrees with a study conducted in North Carolina for assessment of nurses' knowledge and attitudes toward end of life care pain management and revealed that nurses needed more knowledge and education in knowing how to document the patient's pain accurately and administer accordingly (Davis, 2014).

Al-Quliti and Alamri (2015) studied the assessment of pain knowledge, attitudes, and practices of health care providers in Almadinah Almunawwarah, Saudi Arabia and their findings suggest that there is a significant knowledge deficit on pain and pain management. Study findings require immediate action from health care leaders to educate health care providers on pain and pain management (Al-Quliti & Alamri, 2015).

According to qualitative analysis on this point, the KIIs were asked about the reasons for the low level of the knowledge domain of the health care provider in the two burn units, where one of them explained that *"There are two main reasons. The first one, in 2012, copies were distributed to all of the medical staff of the burn unit – Al Shifa Hospital, and after a period of time some of the workers were transferred to work elsewhere and others came to work in the unit didn't inform about this protocol. The second reason, the study sample included the health care provider working in Naser Medical Complex; they are*

unaware of the protocol, which makes the percentage of knowledge low". Another KII added that *"…the reason for the low percentage is that the study sample included the health care provider at the Naser Medical Complex, they are not aware of the existence of the protocol as well as its contents and do not deal with it at all…"*

Also, a KII from Naser medical complex burn department said that *"I believe that most of the 45% is from the health care provider in Al Shifa Medical Complex because all of the Naser Medical Complex team is not aware about the existence of this protocol. Therefore, there is no application".*

4.4 Distribution of the study participants according to receiving training course

Table (4.6): Distribution of study participant according to Training

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
15	**Have you received any training course about the protocol?**						
	I Don't Know	1	4.8	1	25.0	2	8.0
	No	16	76.2	2	50.0	18	72.0
	Yes	4	19.0	1	25.0	5	20.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**
16	**IF YES, Do you feel that you have sufficient information at that training?**						
	I Don't Know	0	0.0	0	0.0	0	0.0
	No	0	0.0	0	0.0	0	0.0
	Yes	4	100.0	1	100.0	5	100.0
	Total	**4**	**100.0**	**1**	**100.0**	**5**	**100.0**
17	**Is there periodic training or review to follow the implementation of the Protocol**						
	I Don't Know	0	0.0	0	0.0	0	0.0
	No	17	81.0	3	75.0	20	80.0
	Yes	4	19.0	1	25.0	5	20.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**
18	**When was the last training?**						
	Before Three Years (2016)	2	50.0	1	100.0	3	60.0
	Before One year (2018)	2	50.0	0	0.0	2	40.0
	Total	**4**	**100.0**	**1**	**100.0**	**5**	**100.0**

Table 4.6 shows the training of participants about the Palestinian national protocols for burns care and management. According to the results, 18 (72%) of participants didn't receive any training course about the protocol, while only 5 (20%) said that they receive training course, and feel that they have sufficient information on that training, and 2 (8%) of participants didn't know if they receive training or not. Also, 20 (80%) of participants answered that there is no periodic training or review to follow the implementation of the Protocol. Knowing that there were 28 participants who answered they did not know or did not remember that there was a protocol, and that number of participants also did not receive any training on the protocol.

Our study agrees with a study titled nurses' perceptions and experiences regarding morphine usage in burn pain management, it was found that 70% of participants indicated not having attended any training program on pain management, it may be necessary to develop such programs to help strengthen their knowledge base which will definitely impact their compliance with burn pain management (Bayuo & Agbenorku, 2015).

Also, a study conducted to explore the evidence on nurses' knowledge and attitudes to pain assessment illustrated that the accessibility of appropriate training, workforce stability and a standardized approach to pain assessment are key to the successful management of pain (Burns & Mcilfatrick, 2015).

According to qualitative analysis on this point, two of the KIIs from Al Shifa medical complex said that *"There have been no formal training sessions for the unit's staff about the protocol and how to implement it, but there is some kind of in-job training but not in a systematic way, rather diligence of some interested colleagues where information is shared with others and urged to apply it".*

Another KII from Naser medical complex add that *"Previously, there was a focus on the on-job training, but there were no tangible results due to the lack of medications, equipment, and supplies that essential to implement the Protocol".*

4.5 Distribution of the study participants according to supportive system

This domain shows the distribution of the study participants according to supportive system contain administration support, availability of multi-disciplinary medical team to deal with burns patient, and availability of job aids (medications, supplies, and needed medical equipment).

4.5.1 Administration support

Table (4.7): Distribution of study participant according to Administration support

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
20	**Is there a follow-up by the management to ensure the implementation of the protocol?**						
	I Don't Know	4	19.0	0	0.0	4	16.0
	No	13	61.9	4	100.0	17	68.0
	Yes	4	19.0	0	0.0	4	16.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**
21	**Does the management follow the style of reward and punishment in applying the protocol?**						
	I Don't Know	4	19.0	0	0.0	4	16.0
	No	17	81.0	4	100.0	21	84.0
	Yes	0	0.0	0	0.0	0	0.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**
22	**Is there a documentation confirming your commitment to implementing the Protocol?**						
	I Don't Know	2	9.5	0	0.0	2	8.0
	No	15	71.4	4	100.0	19	76.0
	Yes	4	19.0	0	0.0	4	16.0
	Total	**21**	**100.0**	**4**	**100.0**	**25**	**100.0**

Table 4.7 shows the management support for protocol implementation. 68% of the study participants answer that there is no follow-up by the management to ensure the implementation of the protocol, while 16% answered that there is management follow-up, and 16% of the study participants didn't know if the management follow-up or not. 84% of

the participants answer that the management doesn't follow the style of reward and punishment in applying the protocol, while 16% answer that they didn't know if the management follows the style of reward and punishment in applying the protocol or not.

Our study agrees with jouda (2018) in a study about evaluating the effects of in-service training programs and their contribution in improvement of the nurses' performance in GG, the study results showed that inadequate support of the administration regarding the managing, monitoring, supervision and follow up.

Regarding to qualitative analysis on this point, the KII said that *"Unfortunately, there is no support from the high-level management in the hospital for the implementation of the protocol. However, there is great diligence by the medial and low-level management of the burns unit to apply as much of the protocol as possible without any external managerial support"*, and added that *"Monitoring and supervision is very important to ensure the implementation of the protocol and know its strengths and weaknesses as well as to identify the obstacles and work to resolve, and this does not exist at all"*.

Another KII added that *"the support and organization of high-level management start from the development of mechanisms, foundations and practical steps for the implementation of the protocol such as the dissemination, training, implementation, evaluation and reassessment, but I think that nothing has been done"*.

Also, one of KII said that *"There is no role or support from the administration for us in the unit, there are no mechanisms for that and there is no reward or punishment for those who are committed or not committed to the protocol, and finally there is no supervision to ensure the implementation of this protocol"*.

Beyond that, another KII illustrates that *"the administration of Naser Medical Complex does not know at all that there is such a protocol. The copies were received from the Adnan Alalami Center and not through the management of the Naser hospital; therefore, there is no follow-up and supervision to ensure the implementation of this protocol"*. Another said that *"the administration of Al Shifa hospital had never asked about the protocol and the extent of its application, but I doubt they are aware of the existence of such a protocol in the unit of burns"*.

Seventy-six percent of the study participants answer that there is no documentation confirming their commitment to implementing the Protocol, and 16% answered that there is documentation confirming their commitment.

Regarding to qualitative analysis on this point, the KII said that *"Documentation is limited to the nursing note sheet and the progress note in the patient's medical file. If a doctor prescribes a strong analgesic drug that is under control, a special form is filled out. Also, in the process of pain assessment by using pain assessment tools, and the reassessment to see how well the patient responds to narcotic or analgesic drugs, there is a serious weakness in documenting this and may reach the point of unconfirmed it in the medical file".*

Another KII adds that *"There is documentation, but it is not good and this includes all medical procedures, especially pain assessment procedures, prescribing treatment and re-evaluation".*

4.5.2 Availability of multidisciplinary medical team

Table (4.8): Distribution of study participant according to availability of multidisciplinary medical team

No.	Variable	AL Shifa		Naser		Total	
		No.	%	No.	%	No.	%
43	**Is there a multidisciplinary medical team to deal with burns patient?**						
	I Don't Know	2	7.4	2	7.7	4	7.5
	No	10	37.0	15	57.7	25	47.2
	Yes	15	55.6	9	34.6	24	45.3
	Total	**27**	**100.0**	**26**	**100.0**	**53**	**100.0**

Table 4.8 shows the availability of the multidisciplinary medical team, according to the study participant's opinion. Around half of the study participants (47.2%) answer that there is no multidisciplinary medical team to deal with a burn patient, while 45.3% answer that there is a multidisciplinary medical team.

But, the result of the assessment checklist of the physical environment in both burn units reveals that there is no complete multidisciplinary medical team presence in both of burn units, and the specialties already found in the burns unit are three only, a burn and plastic surgeon, a nurse and a physiotherapist.

Our study agrees with other study conducted in 2016 about Evaluation of Health Services Provided at the Governmental Burn Units - Gaza Governorates, it highlighted that A multidisciplinary team is required and should be well trained in burns management and cover all needs of burn injury care. The team should include physician, surgeons, anesthesiologists, intensivists, nurses, nutritionist, physiotherapists, psychosocial worker, and others. Nearly two-third of multidisciplinary medical team specialties were unavailable in two burn units of Al Shifa and Naser hospitals in GG (Abdel Rhaman, 2016).

Table (4.9): Distribution of multidisciplinary medical team according to the researcher Assessment checklist

4. Who of the following multidisciplinary medical team is available in burn unit?							
No.	**Specialty**	**Hospital**	**Often**	**Sometimes**	**Not Available**	**Number**	**Is adequate number & suffice to work load?**
1	**Burn and Plastic Surgeons**	**Shifa**		✓		**10**	**No**
		Naser		✓		**4**	
		Total				**14**	
2	**Anesthesiologists**	**Shifa**			✓		**No**
		Naser			✓		
		Total				**Zero**	
3	**Nurses**	**Shifa**	✓			**19**	**No**
		Naser	✓			**26**	
		Total				**45**	
4	**Intensivists**	**Shifa**			✓		**No**
		Naser			✓		
		Total				**Zero**	
5	**Nutritionists**	**Shifa**			✓		**No**
		Naser			✓		
		Total				**Zero**	
6	**Psychosocial experts**	**Shifa**			✓		**No**
		Naser			✓		
		Total				**Zero**	
7	**Pharmacist**	**Shifa**			✓		**No**
		Naser			✓		
		Total				**Zero**	
8	**Physiotherapist**	**Shifa**		✓		**2**	**No**
		Naser		✓		**2**	
		Total				**4**	

The table 4.9 shows that both burn units contain 14 burn and plastic surgeons distributed as 10 in Al Shifa and 4 in Naser, regarding the nurse, there are 45 distributed by both hospitals (19 in Al Shifa, 26 in Naser), and only 4 physiotherapists divided equally by hospitals. Consequently, there is no other specialty of the multidisciplinary medical team in the burn's unit, including the anesthesiologist, intensivist, nutritionist, psychosocial expert, and pharmacist.

Regarding the number of health care providers in both burn units; it brightens up to us that there is a severe shortage of all specialties required in the multidisciplinary medical team. The number of burn and plastic surgeons is low and insufficient to cover the number of patients in both burn units, as well as there is an inability to provide the burn and plastic surgeons in 24-hours a day in the unit, who will follow the patients and their needs all the time.

For this reason, the burn and plastic surgeons working was limited to the morning shift and in the other work shifts (evening and night) the general surgery doctors treat and follow-up the patients who are resident in the unit, as well as burns patients in the reception and emergency department. In cases of critical burns, the call system is followed, where the burn and plastic surgeon is called to follow up the patients.

Regarding to the qualitative analysis on this point, a KII form Naser hospital said that *"since the inception of the burns department in 2008 there is no qualified team (specialized) such as doctors or nursing, we mean here unqualified cadres that they have no scientific experience in burn care"* and added that *"the number of physicians is only 4, only one has a high diploma in burn care and the others are general practitioners who have long been working in the burn department and have practical experience in burn care"*.

Another KII from Al Shifa hospital said that *"there are in the unit ten doctors, and this is very few, where it is limited to work in the morning shift only, and in the evening and night shift there is no doctor resident in the unit, and called from home as needed, so this negatively affects the quality of medical services provided to patients"*.

Regarding the nurses there is also a severe shortage of number, there are 19 nurses in Al Shifa Medical Complex working in three departments in the burn unit, distributed as only 7 nurses in the burn intensive care unit, and 11 nurses work in burn department and only one

nurse work in the operation department. You can imagine the size of the shortage of nursing numbers, which directly affects the quality and efficiency of nursing services provided to burn patients.

A KII explains that *"since the beginning of the burns unit in 2008 there were 35 nurses. Nowadays, the number is decreasing to 17 nurses, due to the lack of nursing numbers in other departments and the inability of the MOH and the government to provide new employment opportunities because of the unjust siege on the Gaza Strip, which negatively affected the quality of health services"*.

The number of nurses at the Naser Medical Complex has been more difficult since the burn unit closed as part of a plan to develop the heart department. The burn patients were accommodated in the men's surgery and women's surgery department, this explains the relative increase in the number of nurses in the Naser Medical Complex compared to the nursing of the burn unit at the Al Shifa Medical Complex, where nursing is responsible for providing nursing services for many specialties as Vascular Surgery, Urology, Neurosurgery, ENT Surgery, General Surgery, Burn and Plastic Surgery, etc.

One of KII said that *"There are only three nurses on men and women's surgical ward dealing with burn patients in the morning shift and the other nursing team provides care for the patient burns in the evening and night shifts. Also, all of nurses didn't receive any training program and not qualified to deal with burn patients"*.

Our study result agrees with another study that was conducted to identify the knowledge and attitudes of nurses, and barriers and facilitators to effective pain assessment and management in infants and children. The authors conclude that the facilitators for the effective management of pain include adequate nurse–patient ratios to ensure the quality of pain management (Alotaibi et al., 2018).

This is confirmed by one of KII saying that *"the number of nursing at the present time is insufficient and this affects the quality of services provided to patients with burns"*.

Also, there is a severe shortage of physiotherapists in the two units. The total number of 4 physiotherapists is divided equally between both burn units. They work only in the morning shift, and sometimes in the evening shift in the burn's unit at Al Shifa Medical Complex only. Physiotherapy, also called occupational and physical therapists, it is an essential part of the multidisciplinary medical team, whose functions begin planning

therapeutic interventions at the patient's admission to maximizing functional recovery. Burned patients require special positioning and splinting, early mobilization, strengthening exercises, endurance activities, and pressure garments to promote healing while controlling scar formation (Cambiaso-Daniel et al., 2018).

According to qualitative analysis, a KII from Naser hospital said that *"there is no physiotherapist's resident in the ward, but there are only two physiotherapists round only in the morning shift for all the cases of the surgery ward, including burns, and they do not have any tasks through evening and night shifts"*.

In the absence of the other specialties of the multidisciplinary medical team, this indicates the size of the problem in the both burn units, especially the absence of an anesthesiologist resident in the department and work with the staff of the unit.

An anesthesiologist who is an expert in the altered physiologic parameters of burned patients is critical to the survival of the patient who usually undergoes multiple acute surgical procedures. Anesthesiologists on the burn team must be familiar with the phases of burn recovery and the physiologic changes to be anticipated as burn wounds heal, as well as playing significant roles in facilitating comfort for burns patients, not only in the operating room, but also during the painful ordeals of dressing changes, staple removal, and physical exercise (Cambiaso-Daniel et al., 2018).

The researcher catch sight of that the anesthesiologists contribute to providing better medical service to burn patients, also preventing the complications of burn and its intolerable pain.

Also, the presence of an integrated multi-disciplinary medical team is a cornerstone in the pain management protocol's application, where all are committed to their task and bear their responsibilities in front of patients with burns.

One of KIIs said that *"There is a severe shortage of doctors and nurses working in the unit, in addition to all of the health care provider specialties such as physiotherapy and psychotherapy, where we must deal with the patient as bio-psycho-social and spiritual"* and added that *"we need more qualified and experienced nurses and doctors to reach a degree of patient satisfaction with the services provided. Also, the absence of resident psychologists in the unit will increase the suffering of patients because psychological support is very important in cases of burns patients"*.

Also, he explains that *"there is no a multidisciplinary medical team in the burn units, especially the anesthesiologist. There is no anesthesiologist resident in the unit, to follow up the complaints of patients and give them suitable analgesics and sedative drugs, so its absence increases the suffering of patients and prevents the health care provider from providing services as required".*

Another KII said that *"As long as there is no qualified health care provider and there is no integrated multidisciplinary medical team, the protocol cannot be applied".*

Another added that *"There are no intensive care doctors to deal with patients who need intensive care, especially in the field of narcotic drugs and mechanical ventilator machine".*

He also noted that *"The lack of a multidisciplinary team is one of the most important obstacles, so all of the team disciplines have responsibilities to the patient and work to ensure that the patient does not feel any pain, it is inconceivable that the burn doctor to perform the tasks of anesthesiologist and prescribe narcotic medications, follow-up the ICU and provide psychological support, etc. Everyone should stand up to their responsibilities and be creative in their respective fields. Also, one of the greatest problems and the biggest obstacle is the absence of a resident anesthetist in the department. One of the problems we are experiencing now is two cases of emergency and lifesaving operations must be done for them today and not tomorrow, but we are not able to provide an anesthesiologist they were postponed for tomorrow!, so we giving the two cases triple strong antibiotic in an attempt not to reach the degree of septicemia".*

4.5.3 Availability of medications stipulated in the protocol

Table (4.10): Distribution of availability of medications stipulated in pain management protocol according to the researcher assessment checklist

6. Are the following drugs listed in the protocol available continuously or at least the last 6 months:						
No.	**Medication**	**Hospital**	**Insufficient 0-25%**	**Sometimes 26-50%**	**Often 51-75%**	**Most of the Times 76-100%**
1	**Paracetamol**	**Shifa**			✓	
		Naser			✓	
2	**Oromorph**	**Shifa**	✓			
		Naser	✓			
3	**Morphine**	**Shifa**				✓
		Naser	✓			
4	**Ibuprofen**	**Shifa**				✓
		Naser			✓	
5	**Promethazine**	**Shifa**			✓	
		Naser				✓
6	**Fentanyl**	**Shifa**				✓
		Naser	✓			

The table 4.10 shows that availability of medications listed in Palestinian national protocols for burns care and management, especially in controlling patient pain resulting from burns as well as pain resulting from certain medical procedures.

According to the results, the Paracetamol is often available (51%-75%) in both burn units, while the Oromorph is not available (0%-25%) in both burn units. Also, the Morphine is available most of the time (76%-100%) in Al Shifa hospital burn unit, but insufficient (0%-25%) in Naser hospital burn unit. The Ibuprofen is available most of the time (51%-75%) in Al Shifa hospital burn unit, and often available (51%-75%) in Naser hospital burn unit. Regarding Promethazine is often available (51%-75%) in Al Shifa hospital burn unit, and available most of the time (51%-75%) in Naser hospital burn unit. Finally, the Fentanyl is most of the time (51%-75%) in Al Shifa hospital burn unit, but insufficient (0%-25%) in Naser hospital burn unit.

Regarding this point, the KII said that *"There is a severe shortage of equipment to provide health services for burn patients, especially analgesics and narcotic drugs which necessary to alleviate the pain and suffering of patients"*.

Another KII explains that *"We live under a severe siege in the Gaza Strip that affects all walks of life as well as medical services and supplies purely humanitarian. So, we carve in the rock to serve our people and our patients. For that, there is a severe shortage of medications. This oblige the patient to provide it at his own expense, which increases his suffering and financial problems. These drugs are not available in the MOH as a result of the blockade".* Also, he noted that *"For example, the number of in-patient today more than 13 cases, including 3 cases in ICU, and only 10 Morphine ampoules are available, which is insufficient even minimal"*.

4.5.4 Availability of medical supplies

Table (4.11): Distribution of available of medical supplies for pain management, according to researcher assessment checklist

5. The medical supplies for pain management are available like:						
No.	**Equipment**	**Hospital**	**Insufficient 0-25%**	**Sometimes 26-50%**	**Often 51-75%**	**Most of the Time 76-100%**
1	Emergency trolley	**Shifa**				✓
		Naser				✓
2	Monitor Machine	**Shifa**				✓
		Naser		✓		
3	Oxygen Sources	**Shifa**				✓
		Naser			✓	

Also, Table 4.11 shows that the availability of other medical equipment contributes commitment of a health care provider with burn pain management for burn patients. This equipment like an emergency trolley, monitor machine, and oxygen source. The result of an assessment checklist of physical environment reveals that the emergency trolleys are available most of the time (76%-100%) in both burn units. While the monitor machines are available sometimes (26%-50%) in Naser hospital burn unit, and available most of the time (76%-100%) in Al Shifa hospital burn unit. Also, the oxygen sources are often available

(51%-75%) in Naser hospital burn unit, and available most of the time (76%-100%) in Al Shifa hospital burn unit.

In view of the previous findings, the researcher finds that there is a shortage of medical supplies, especially in the burn's unit at the Naser Medical Complex, where there are only two monitor machine in the women's surgical department, and there is no monitor machine in the men's surgical department. With regard to oxygen sources, which is one of the basic equipment in the health centers, but its presence in the surgical departments is limited to the patient's rooms only and there are no oxygen sources in the dressing room in both surgical departments.

This is confirmed by KII, where all of them reported that *"After more than 10 years of the establishment of the burn unit, there is a severe shortage of equipment, devices and supplies; so many of the devices were exposed to malfunction and consumption, which is essential in the unit burns, as well as some important supplies and medications that essential for pain management and palliative care*".

Another KII from Naser hospital said that *"There is a lack of any necessary equipment to deal with patients such as monitors in the ward. The dressing room is not equipped and not qualified to deal with burn patients, where there is no proper ventilation and there is no air conditioner, as well as there is no monitor and oxygen source in the room. Also, there is a shortage of equipment and supplies to complete the dressing procedure as well as to provide nursing care for burns".*

4.6 Assessment checklist of physical environment

Assessment checklist of physical environment is the third tool in this study, that aimed to assess how is the appropriateness of the workplace design and the availability of instruments for implementing the protocol, and we discussed some of its items in the supportive system domain like administration support, the availability of the multidisciplinary health care provider in the burn unit and job aids (medications, supplies and needed medical equipment). This entire item discussed above except the workplace design and its appropriateness to implementation and compliance with the protocol.

The qualitative part about this point revealed that inappropriateness of workplace design in Naser medical complex burns unit. One of KII explains that "*the workplace and work environment plays an important role in the compliance level, where the place in the Naser*

medical complex until now is not suitable and does not have the lowest ingredients for the care of burns. It has 3 simple rooms within the surgical department, and the total number of beds is only 7, two for adult males and 5 for children and females. In addition, two dressing room which is not suitable and does not have a minimum level of burn care".

But it is different in Al Shifa medical complex burns unit. Another KII noted that "*Adnan Alalami Center for Burns Treatment is the only center in the Gaza Strip specialized in this field and therefore the rate of knowledge and commitment to implement the protocol is greater. This is different from the burns ward of Naser Medical Complex as it is part of the surgical department, which includes many specialties such as general surgery, vascular surgery, plastic surgery, urology surgery and others, so the place is not specialized in treating burns cases only. This affects the percentage of knowledge and compliance to the protocol".*

Also, the checklist assesses if there is enough copy of the Palestinian National Protocol for Burns Care and Management in the burn unit, and if there are hard copies of pain assessment tools ready for use, in addition to that if there are supporting policies to ensure the application of the pain management protocol.

Table (4.12): Distribution of physical environment of burn units according to Assessment checklist

No.	Items	Al Shifa		Naser	
		Applied	Not Applied	Applied	Not Applied
1	There is enough copy of the Palestinian National Protocol for Burns Care and Management in the burn unit.	✓			✓
3	There are hard copies of pain assessment tools ready for use.		✓		✓
7	The results of pain assessment and the interventional pain management consistently documented in the health record.		✓		✓
8	There are supporting policies to ensure the application of the pain management protocol		✓		✓

The interest in protocols and clinical guidelines has its origin in issues that most health care systems face: rising health care costs, fueled by increased demand for care, more expensive technologies, and an ageing population; variations in service delivery among

providers, and hospitals, and either overuse or underuse of services. Clinicians, policy makers, and payers see guidelines as a tool for making care more consistent and efficient and for closing the gap between what clinicians do and what scientific evidence supports in order to improve the quality of life for patients (woolf et al., 1999).

The principal benefit of guidelines is to improve the quality of care received by patients. The greatest benefit that could be achieved by guidelines is to improve health outcomes. Guidelines that promote interventions of proved benefit and discourage ineffective ones have the potential to reduce morbidity and mortality and improve quality of life (woolf et al., 1999).

The table 4.12 shows, although the percentage of participants who did not have a copy of the protocol is 32 (60%), the results of the assessment checklist showed that there is enough copy of the Palestinian National Protocol for Burns Care and Management in the burn unit in the Al Shifa Medical Complex. Contrarily, in the burns department of Naser Medical Complex there are only two copies of the protocol, the first one present with a head of nursing burns department and the last one with a head of doctor cosmetic and burns department.

One of KII from Al Shifa hospital said that *"A sufficient number of copies are available in the burn unit, which is available with the Head of the Department of Physicians and the Nursing Supervisor. In 2012, copies were distributed to all of the health care providers in the unit at that time, including doctors, nurses and physiotherapists. But there are a number of doctors and nurses unaware of the existence of a protocol, as well as not having a copy of it, most of them worked in the unit after 2013".*

Another KII from Naser hospital said that *"There are only two hard copies of the protocol, one of them with the last head of the nursing department and the other with the head of the physician department"* and added that *"the actually happening is the arrival of two copies from the Adnan Alalami burn Center in the Al Shifa hospital to the burns ward of the Naser hospital, where we were not involved in the development of this protocol, and required from us to apply it".*

Recently, after the collection of data for this study, a training course on burns was held targeting the nurses in Naser Medical Complex, where the practical training place was in the burn's unit in Al Shifa Medical Complex, Copies of the protocol were distributed to all

participants in the training. This course will improve the quality of nursing services provided to burn patients at the Naser Medical Complex.

According to the availability of hard copies of pain assessment tools ready for use, the results show that not only there are no printed copies of pain assessment tools, but also there is a severe weakness in the documentation by the health care provider about the degree of pain as well as the action taken and the reassessment to determine the degree of patients' response, and document all of this in the patient's medical file in the both governmental burn units.

The qualitative part about this point, all of KIIs said that *"In our assessment of pain, pain assessment tools are not used as they are not already available. Therefore, there is no reassessment to determine the response of the patient to treatment, but what is done in response to the patient's complaint and giving analgesics as available in the unit".*

In addition, there are no enough efforts by the administration or written supporting policies to ensure the application of the pain management protocol in the both governmental burn units.

4.7 Non-pharmacological analgesics

Table (4.13): Distribution of uses of non-pharmacological methods according to medical staff opinions.

	Hospital	Seldom 0-25%		Sometimes 26-50.0%		Often 51 to 75 %		Most of the time Above 75%		Mean	Weighted mean	Rank
		No.	%	No.	%	No.	%	No.	%			
Limb elevation	**Shifa**	3	11.1	8	29.6	8	29.6	8	29.6	2.78	69.5	2
	Naser	5	19.2	10	38.5	10	38.5	1	3.8	2.27	56.75	
	Total	**8**	**15.0**	**18**	**34.0**	**18**	**34.0**	**9**	**17.0**	**2.53**	63.25	
Minimize the number of dressing changes	**Shifa**	6	22.2	12	44.4	7	25.9	2	7.4	2.19	54.75	4
	Naser	6	23.1	8	30.8	11	42.3	1	3.8	2.27	56.75	
	Total	**12**	**22.6**	**20**	**37.7**	**18**	**34.0**	**3**	**5.7**	**2.23**	55.75	
Distraction	**Shifa**	9	33.3	13	48.1	2	7.4	3	11.1	1.96	49	6
	Naser	7	26.9	13	50.0	6	23.1	0	0.0	1.96	49	
	Total	**16**	**30.2**	**26**	**49.1**	**8**	**15.1**	**3**	**5.7**	**1.96**	49	
Relaxation exercise	**Shifa**	9	33.3	11	40.7	3	11.1	4	14.8	2.07	51.75	5
	Naser	10	40.0	4	16.0	11	44.0	0	0.0	2.04	51	
	Total	**19**	**36.5**	**15**	**28.8**	**14**	**26.9**	**4**	**7.7**	**2.06**	51.5	
Imagery	**Shifa**	14	53.8	10	38.5	1	3.8	1	3.8	1.58	39.5	7
	Naser	14	53.8	7	26.9	4	15.7	1	3.8	1.69	42.25	
	Total	**28**	**53.8**	**17**	**32.7**	**5**	**9.6**	**2**	**3.8**	**1.63**	40.75	
Air conditioning	**Shifa**	4	14.8	10	37.0	8	29.6	5	18.5	2.52	**63**	3
	Naser	5	19.2	11	42.3	10	38.5	0	0.0	2.19	**54.75**	
	Total	**9**	**17.0**	**21**	**39.6**	**18**	**34.0**	**5**	**9.4**	**2.36**	**59**	
Music therapy	**Shifa**	16	59.3	7	25.9	3	11.1	1	3.7	1.59	**39.75**	8
	Naser	14	53.8	9	34.6	3	11.5	0	0.0	1.58	**39.5**	
	Total	**30**	**56.6**	**16**	**30.2**	**6**	**11.3**	**1**	**1.9**	**1.58**	**39.5**	
Spiritual Therapy	**Shifa**	5	18.5	10	37.0	5	18.5	7	25.9	2.52	**63**	1
	Naser	2	7.7	9	34.6	8	30.8	7	26.9	2.77	**69.25**	
	Total	**7**	**13.2**	**19**	**35.8**	**13**	**24.5**	**14**	**26.4**	**2.64**	**66**	
Total	**Shifa**									**2.14**	**53.59**	
	Naser									**2.08**	**52.16**	
	Total									**2.11**	**52.89**	

Despite many efforts with various pharmacological approaches, daily practice demonstrates that adult burn patients still experience considerable pain. Adjunct interventions are thus indicated. It was shown that non-pharmacological interventions used

in combination with pharmacological interventions, may result in pain relief (de Jong et al., 2007).

In our study, the researcher asked the health care provider about the usage of certain non-pharmacological methods to reduce pain as much as possible, these include limb elevation, minimize the number of dressing changes, distraction, relaxation exercise, imagery, air conditioning, music therapy, and spiritual Therapy.

Table 4.13 shows that the uses of non-pharmacological methods according to health care provider practice in both burn units with mean 52.89%, which means that the uses rate of health care provider of non-pharmacological methods in the controlling of pain is moderate and underutilization.

Our study agree with a study was conducted in the United States to identify factors that may influence the implementation of acute pain management guidelines, they found that there is underutilization of non-pharmacologic therapies to control pain was widespread (Jiang et al., 2001).

According to the result the highest method was *"Spiritual Therapy"* with weighted mean 66%, followed by *"Limb elevation and air conditioning"* as non-pharmacological method with weighted mean 63.25% and 59% respectively.

Also, the result illustrated that the lowest method was *"Music Therapy"* with weighted mean 39.5%, followed by *"Imagery and Distraction"* as non-pharmacological method with weighted mean 40.75% and 49% respectively.

Contrarily, our results are inconsistent with the study in Netherlands about Non-pharmacological nursing interventions for procedural pain relief in adults with burns: A systematic literature review, a 17 studies showed that the intervention had a positive effect on pain outcomes and no adverse effects of the reviewed interventions were reported, the best available evidence was found for active hypnosis, and distraction relaxation (de Jong et al., 2007).

Another study was conducted in Sweden showed that the non-pharmacological strategies used most frequently to manage pain were thermal regulation (physical method) and distraction (cognitive–behavioural method), and the pain scale decline after 24 hour (Idvall et al., 2005)

Also, a study was titled the efficacy of non-pharmacological interventions for procedural pain relief in adults undergoing burn wound care: A systematic review and meta-analysis of randomized controlled trials. The study revealed that the distraction interventions, particularly those using virtual reality, and hypnosis revealed the largest effects on pain relief. Non-pharmacological interventions further resulted in a significant, homogeneous effect on anxiety reduction (Scheffler et al., 2017).

The researcher believes that spiritual therapy as a non-pharmacological method obtained the highest rank because because the population of the Gaza Strip is predominantly religious, where patients resort to the relief of pain from God through praying, athkar and reading Quran. In addition, the culture of the Gaza people is not accustomed to non-pharmacological means such as music, and in some patients the situation may be unacceptable or unacceptable.

4.8 Compliance with burn pain management

The compliance checklist for health care provider practices during morning, evening and night shifts, and in moments of suffering or patient's complaining of pain. 89 medical files were reviewed and audited to assess how the burn health care provider was working. Also, to what extent the pain management protocol was implemented and finally to determine the compliance level with the protocol.

Table (4.14): Distribution of patients' data according to compliance checklist for health care provider

Items	No.	%
Source of patients' files (Burn units)		
Al-Shifa	83	93.3
Naser	6	6.7
Total	**89**	**100.0**
Age		
Children (1 day to 18 years)	72	80.9
Adult (over 18 years)	17	19.1
Total	**89**	**100.0**
Mean = 10.03, MD = 3.0, SD± = 17.46		
Conscious status		
Conscious	89	100.0
Unconscious "Intubated"	0	0.0
Total	**89**	**100.0**
Pain level		
Mild	6	6.7
Moderate	44	49.5
Severe	39	43.8
Total	**89**	**100.0**

The table 4.14 shows that the researcher makes 89 compliance checklists divided into 83 checklists in the burn unit at the Al Shifa Medical Complex and 6 checklists in the burn department at Naser Medical Complex. The reason for the increase in the number of checklists in Alshifa hospital more than the Naser Hospital that the Al Shifa hospital serves all GG, but the Naser Hospital serves only the Rafah and Khan Younis governorates. Also, the nature of the cases treated in the Naser Medical Complex are classified as simple and moderate, burns less than 20% of total body surface area (TBSA), and those cases that burns exceed 20% of TBSA, critical cases, are transferred to the burn unit in the Al Shifa Medical Complex. Therefore, the largest numbers of cases are in Al Shifa hospital, and the patients at Naser hospital are not always available.

One of the key informant said that *"Adnan Alalami Center for Burns Treatment is the only center in the GS that provides services for burn patients, where it receives all cases*

exposed to burns from three governorates in the GS, which are North, Gaza and Central Governorate, as well as receiving cases transferred from the burns department of Naser Medical Complex, which Serving the governorates of Rafah and Khan Younis, where these cases are very critical and need intensive care in the intensive care unit in Adnan Alalami Center of Al Shifa Medical Complex, where there some supplies and specialized health care provider are available in it but not available in the burns department of Naser Medical Complex".

Regarding the age group of patients whose medical files checked was 72 children (80.9%) and 17 adult patients (19.1%). Filling the compliance checklist depends on the consciousness level and pain severity, where all of the 89 checklists were for conscious patients, with levels of pain ranging from mild pain for 6 checklists (6.7%), moderate pain for 44 checklists (49.4%), and severe pain for 39 checklists (43.8%).

Table (4.15): Distribution of compliance checklist for medical files

No.	Items	Yes		No		Total	
		No.	%	No.	%	No.	%
1	The severity of the pain is assessed by using the Visual Analogue Scale Or "Faces" Pain Rating Scale	0	0.0	89	0.0	89	100.0
	Severity of pain						
2	The patient has mild pain and has been given Paracetamol + Oromorph S.O.S	0	0.0	6	100.0	6	100.0
3	The patient has moderate pain and has been given Paracetamol + Oromorph regularly.	2	4.5	42	95.5	44	100.0
4	The patient suffers from severe pain and has been given Morphine IV or Infusion	2	5.1	37	94.9	39	100.0
	Total					**89**	**100.0**
5	The pain is reassessed every two hours	0	0.0	89	100.0	89	100.0
~~6~~	Non-pharmacological support methods are used to control pain	21	23.6	68	76.4	89	100.0
7	Documentation was performed regarded:						
	a- Pain assessment	0	0.0	89	100.0	89	100.0
	b- Drug description	89	100.0	0	0.0	89	100.0
	c- Patient response	0	0.0	89	100.0	89	100.0
	d- Pain reassessment	0	0.0	89	100.0	89	100.0
	Mean = 12.8%, MD = 10, SD± = 4.76						

The table 4.15 shows that the severity of the pain is not assessed in all compliance checklists by using any pain scale that listed in the pain management protocol as the Visual Analogue Scale, "Faces" Pain Rating Scale and Behavioral Observation Pain Rating Scale.

So what is done in the field? As a response to a patient's complaint, the degree of pain is assessed verbally and the painkiller is prescribed and given according to that assessment and according to the list of drugs within the unit. So all of the patients who are suffering

from mild pain (6 patients) haven't been given Paracetamol + Oromorph S.O.S as listed in the protocol.

Regarding the patients who suffer from moderate pain the study shows that 95.5% of patients hadn't been given Paracetamol + Oromorph regularly as prescribed in the protocol, while 4.5% of patients have been given pain killer as listed in the protocol.

Regarding the patients who suffer from severe pain the study shows that 94.9% of patients hadn't been given Morphine IV "infusion" as stipulated in the protocol, while 5.1% of patients have been given pain killer as stipulated in the protocol.

Furthermore, there is no pain reassessment every two hours after receiving pain killer according to all compliance checklists as listed in the protocol.

In addition, regarding the documentation in all of compliance checklists there are no document confirm the commitment of health care provider about pain assessment, drug description, patient response and patient reassessment as listed in the protocol, while there is a documentation about other types of medications like Tramadol, Pethedin, Morphine and NSAIDs.

Finally, depending on the previous data the study revealed that the total compliance level of health care provider with the burn pain management protocol in both burns units was 12.8%.

Our results are consistent with the studies that conducted in Canada and Brazil, which illustrated that the adherence rate to guidelines was 12.9% and 22% respectively (Elias et al., 2019; França et al., 2015).

Also our study agrees with a studies carried out in Nigeria, which showed that only a small percentage (27.50%) of the respondents adhered clinical practice guidelines (Akindele et al., 2019).

Contrarily, our results are inconsistent with the study in 2007 about improving prescription in palliative sedation: compliance with Dutch guidelines, it found that the rate of noncompliance to the guidelines was 43% (Hasselaar et al., 2007). Another study conducted in United States showed that physicians' and pharmacists' adherence to the guidelines was 80% (Beauclair & Stoner, 1986).

According to qualitative analysis about this point, one of KII said that *"Unfortunately, there is a serious lack of compliance with the application of the Protocol for several reasons including; differences of academic qualification and practical efficiency among health care providers, as well as different interests of the health care provider, some of whom are interested more besides plastic surgery and some of them is interested in the treatment of pain and palliative care and so on. Also lack of medical supplies, equipment and some types of medications prevents the application of the protocol. In addition, the lack of knowledge of the health care providers about the protocol and lack of training on it".*

Another KII from Al Shifa hospital added that *"After the development of the protocol we faced many obstacles in the application of it, and in my opinion regarding the pain management, the compliance rate does not exceed 10% at best condition".*

Also KII from Naser hospital said that *"As stipulated in the protocol, I can say that there is no application for all, especially in the infection control, nutrition, pain management, and change dressing mechanism"* and added that *"We exerted great efforts to implement the protocol and sought to provide some medical supplies necessary for this, but we have been hampered by lack of supplies and equipment's and the lack of qualified and training".*

The researcher sees that there is a big problem in the compliance of the health care providers in the application of the protocol of pain management and palliative care. These findings are based on the patient files reviewed and do not necessarily reflect the true compliance rate of health care providers to implementation the pain management protocol, as they may be committed but there is no documented confirm that.

4.9 Differences of compliance level among nurses and physicians, and workplace

This part represents the differences between compliance level and health care provider, nurses and doctors, as well as the differences between compliance level and workplace according to compliance checklist and medical files reviewed.

4.9.1 Differences in compliance level among nurses and physicians

Table (4.16) Differences in compliance level among nurses and physicians

	Compliance	Mean	Median	SD±
1	**Doctors**	4.72	0	8.54
2	**Nurses**	20.90	20	4.2
	Total	**12.8**	**10**	**4.76**

Table 4.16 showed that the differences between compliance level and health care provider. Depending on the previous data the study revealed that nurses were complied with the protocol more than doctors with 20.9% and 4.7% respectively.

Our study agreed with a study showed that there is differences of compliance between physicians and nurses in pain management (Jho et al., 2014).

After reviewing the medical files the researcher believes that the reason behind the higher rate of commitment of nurses more than doctors is attributed to the commitment of nurses to document their practices in the nursing notes sheet, and making follow up documentation confirmed their practices. But in case of doctor's documentation, the most of reviewed patient's files are limited to prescribing medication only and there is no documentation for follow-up.

4.9.2 Differences between workplace and compliance level

Table (4.17): Differences between workplace and compliance with protocol

Demographic Data	Workplace	No.	Mean	SD±	Test	Sig.
	Shifa	83	18.33	4.08	T	.003
	Naser	6	12.40	4.57	3.079	

Table 4.17 shows that there is statistical differences between workplace and compliance, the differences were for Al Shifa burn unit with mean 18.33% (P value= 0.003).

Contrarily, our results are inconsistent with the study of (Akindele et al., 2019), which showed that there is no statistical differences between workplace and adherence with protocol (P value= 0.380).

According to qualitative analysis about differences between workplace and compliance, most of KII said that "*the workplace and work environment plays an important role in the compliance level, where the place in the Naser medical complex until now is not suitable and does not have the lowest ingredients for the care of burns. It has 3 simple rooms within the surgical department, and the total number of beds is only 7, two for adult males and 5 for children and females. In addition, two dressing room which is not suitable and does not have a minimum level of burn care*".

Another KII noted that "*Adnan Alalami Center for Burns Treatment is the only center in the Gaza Strip specialized in this field and therefore the rate of knowledge and commitment to implement the protocol is greater. This is different from the burns ward of Naser Medical Complex as it is part of the surgical department which includes many specialties such as general surgery, vascular surgery, plastic surgery, urology surgery and others, so the place is not specialized in treating burns cases only. This affects the percentage of knowledge and compliance to the protocol*".

The researcher attributed this expected result to the huge difference in the availability of equipment, medications and qualified health care provider, despite they are few, in Al Shifa Medical Complex burns unit and it nearly absent in the Naser Medical Complex burns ward, and this was confirmed by the results of the study mentioned earlier.

4.10 Differences between knowledge and demographic data

In this aspect, the researcher discusses the difference between the socio-demographic variables which include (age, gender, marital status, workplace, job title, academic qualification and years of experience) and knowledge.

Table (4.18): Differences between Knowledge and Demographic Data

Demographic Data	Items	No.	Mean	SD±	Test	Sig.
Gender	Male	39	48.58	21.92	T 2.140	0.037
	Female	14	34.52	18.38		
Age	30 Years and less	11	45.45	22.75	F 1.361	0.266
	From 31 to 35 Years	17	38.56	21.38		
	From 36 to 45 Years	12	54.17	17.10		
	Above 45 Years	12	47.69	21.64		
	Total	**52**	**45.73**	**21.07**		
Marital Status	Single	9	40.12	20.18	T 0.713	0.479
	Married	44	45.83	22.19		
Work Place	Al Shifa	27	50.00	22.54	T 1.497	0.141
	Naser	26	39.53	20.02		
Job Title	Specialist Doctor	9	56.79	12.96	F 3.736	0.017*
	General Physician	2	38.89	0.00		
	Staff Nurse	29	48.28	23.25		
	Practical Nurse	13	29.91	17.35		
	Total	**53**	**44.86**	**21.79**		
Academic Qualification	Doctorate (Ph.D.)	2	50.00	7.86	2.265	0.075
	Master	10	55.56	18.89		
	High diploma	5	57.78	15.01		
	Bachelor	23	43.72	23.11		
	Diploma	13	32.91	20.09		
	Total	**53**	**44.86**	**21.79**		
Years of Experience	5 Years and less	13	45.73	20.18	F 0.115	0.951
	From 6 to 10	17	45.10	22.90		
	From 11 to 15 Years	10	48.33	22.23		
	More than 15 Years	7	50.00	18.43		
	Total	**47***	**46.69**	**20.81**		

★Missed data

Table 4.16 shows that there are no statistical differences between knowledge and demographic data (age, marital status, work place, academic qualification, experience), while there are statistical differences between knowledge and gender, the differences were for male with mean 48.58%, and the job title, by using post-hock test (scheffe) the differences was for specialist doctor with mean 56.79% followed staff nurse with mean 48.28% (annex 15).

Our study agrees with Jouda (2018) a study showed that there are no statistical significance differences in all the study domains regarding to marital status, age groups, qualifications and years of experience. Contrarily, our results are inconsistent regarding the gender and job title of participants (Jouda, 2018).

Also, our study agreed with another study conducted in Korea, which illustrated that specialist physicians had better knowledge of pain management than did nurses (Jho et al., 2014).

The Qualitative result about the differences between socio-demographic characteristics of participants and knowledge level through in-depth interviews, all of KII agreed by saying that *"The age, gender, marital status have not any differences in the level of knowledge, but there are obstacles and other factors related, the most important of which is the training of health care provider (in service education and in-job training) that will increase knowledge and compliance level"*.

Contrary to the results one of KII added that *"Years of experience and academic qualification of employees have a strong influence on the level of knowledge. The more years of experience and more education level have greater the scientific outcome and wide knowledge in the field of pain management and palliative care"*. Another explained that *"the workplace plays an important role in increasing the level of knowledge of health care providers, where the specialized place to deal with specific kind of patients and we mean here burn patients, the workers are more knowledgeable in this area, and this is unlike the non-specialized place, which lacks The lowest ingredient of burn care"*.

By reviewing of the literature and through the researcher's modest experience in this field, the researcher believes that practical experience and scientific qualification have a prominent role in increasing knowledge, as well as the training of health care providers on the protocol of treatment of burn pain, with the provision of copies for all staff in the units of burns, and activating the role of administration through the work of periodic review of the workers on the extent of their knowledge of the protocol to ensure that they stay fully informed and thus improve the level of compliance with its implementation.

4.11 Obstacles facing the application of the pain management protocol

There are many obstacles to applying the pain management protocol to burn patients. According to the study participant's opinions, the most important and the highest rank four reasons impeding the application of the Protocol is:

- Lack of knowledge of a large number of health care providers about the presence of a pain management protocol for patients with burns, as well as they are not receiving a training course on that protocol.
- The severe shortage of medical staff, medication and medical equipment that required for the application of the Protocol.
- Lack of a multidisciplinary medical team to cope with the burn patient, especially the anesthesiologist.
- Finally, Lack of oversight of the management / supervision to follow up the extent of protocol application.

Other reasons – but less rank - facing the application of the pain management protocol as fear of complications from the use of narcotic drugs such as respiratory depression and addiction. Also, the administration's lack of interest in the protocol, and the absence of incentives and psychological support for the health care provider. As well as the absence of a special burns unit for burn patients at the Naser Medical Complex. These reasons and others play a very important role in failure of implementing the pain management protocol in Gaza Strip hospitals.

Also, according to KII opinion about the obstacles they said that *"there are many obstacles facing the compliance with the protocol as physical obstacles which include lack of specialized workplace mainly in Naser medical complex and lack of essential medication for pain management as morphine, where there is suffering we face with the pharmacy in order to provide some types of medications and basic requirements for the treatment of burns patients. Also, we have administrative obstacles as lack of follow up and supervision about the implementation of the protocol, and lack of support from high-level management to provide the needed supplies, equipment and medication to implement the Protocol, as well as lack of incentives for compliant health care providers"*.

Furthermore, they added that *"there are professional obstacles included lack of trained and qualified health care provider with a severe shortage of them, and lack of knowledge and*

fear from the adverse effect of sedative medication as addiction and respiratory depression. Also, lack of the multidisciplinary medical team is considered one of the most important obstacles, especially lack of persistent anesthesiologist in burns unit ".

Other obstacles reported from one of KII said that *"there are protocol-related constraints as the rigidity of the protocol and the dependence in the treatment of pain on only one type of narcotic drugs, morphine, is considered a hindrance, which is not available permanently and if available there are no large quantities cover the number of patients in the units. Therefore, the protocol should be reviewed and updated to include other types of medication such as Tramadol and Pethedin".*

Other system-related obstacles noted by KII *"There are many restrictions in the case of prescribing an anesthetic treatment, where a form contains the name and type of the drug should be filled, the dosage given, the name and seal of the doctor, the name and signature of the nurse who gave the medicine and the name and signature of another nurse who witnessed the administration and the remaining quantity. This is major obstacle in dealing with these drugs, in my view the doctor and nurse should be given an authority to give the appropriate dose of analgesics without referring to the doctor every time and without the need to attend the doctor every time of pain".*

Our study agreed with another study conducted in Australia which revealed that the barriers to effective pain management include the absence of pain education and assessment tools, parents' reluctance to report pain and insufficient prescription of analgesia by physicians (Alotaibi et al., 2018).

Also, our study agreed with Carr 2008, which highlighted that the organization within which pain management takes places often imposes a number of restrictions which may inadvertently hinder the effective management of pain. These can relate to accountability for pain management, local culture, trust or hospital policies regarding drug administration and resources available (Carr, 2008).

4.12 Suggestions for improving the commitment of staff to implement the protocol

As for the suggestions aimed at increasing the health care provider's commitment to apply the pain management protocol for burn patients, the highest rank four suggestions of the study participants are:

- Increasing the awareness of the health care provider about the existence of the protocol, through the distribution of the protocol to all the health care provider, in addition to provide a training course on how to apply it.
- Provide sufficient number of health care provider, medication and medical supplies required to implement the protocol.
- Provide a multidisciplinary health care provider to deal with burns patients, especially anesthesiologists.
- Activate the support of management through continuous supervision and monitoring the application of the protocol

Other reasons, increase incentives and improving the salaries of health care providers. Also, improving psychological well-being of the staff, as well as conducting a periodic review of the protocol to keep up with the recent research in pain management and palliative care and according to available resources. In addition to bringing expertise to improve the scientific and practical capabilities of the treatment of pain caused by burns.

Also, according to KII opinion about the suggestions for improving the commitment of staff to implement the protocol, most of them said that *"Activate the role of management through follow-up, monitoring, supervision and provide incentives for health care provider, also providing the necessary equipment, supplies and medications for application of the protocol"*. They added that *"In addition, compensating the severe shortage of health care providers mainly doctors and nurses, as well as provide qualified multidisciplinary medical team mainly the specialty of anesthesiologists, intensivists and psychosocial worker resident in the burns unit"*.

Furthermore, they asserted that *"Activating the incentive system for the employees in the unit, especially the provision of salaries and work to reward them plays an important role in compliance with pain management protocol"*.

KII at Naser Hospital added that *"working to equip the burn unit with the necessary medical supplies, equipment and needed medications and the qualified health care*

providers and opening it to work (suitable work place), would contribute significantly to improve compliance with the application of burn pain management protocol".

Our study agrees with Tabeel study about motivation and job performance among nurses in GS governmental hospitals – Palestine showed that there is statistical relationship between motivation and performance (Tabeel, 2014)

Also, our study agreed with another study conducted in Korea, which showed that an effective educational strategy for pain management is needed in order to improve medical professionals' knowledge and clinical practices (Jho et al., 2014).

Chapter Five

Conclusion and recommendation

5.1 Conclusion

This study was conducted to assess the compliance with burn pain management protocol in the governmental hospitals in GG. It has been done using a combination of quantitative and qualitative approaches in order to enhance the quality of burn care and quality of patient's life, and to provide recommendations that could contribute to improving the knowledge and compliance level with burn pain management, that might impact on the health care services for burns patients.

The findings of our study revealed that the majority of the study sample was male, with age group between 31-35 years, and the majority of participants were married. Half of the participants work in Al Shifa Medical Complex burns unit, and the other half in the Naser Medical Complex burns department.

Additionally, seventy nine percent of participants are nurses, while 21% of participants are doctors, and 43.4% of the participants had a BSC certificate, while 22.7% postgraduate degree.

Our study showed that the health care provider knowledge level about burn pain management protocol is 44.9%, and the total compliance level of health care provider with the burn pain management protocol in both burn units was 12.8%, while the nurses were complied with the protocol more than doctors with 20.9% and 4.7% respectively. Also, there is statistical differences between workplace and compliance, the differences were for Al Shifa burns unit with mean 18.33% (P value= 0.003).

According to the results, 80% of participants did not attend any training program on pain management protocol.

Also, the administrative support is very weak, which 68% of the study participants answer that there is no follow-up by the management to ensure the implementation of the protocol, and 16% of the study participants didn't know if the management follow-up or not. In addition, there are no enough efforts by the administration or written supporting policies to ensure the application of the pain management protocol in the both governmental burn units.

The result of the assessment checklist of the physical environment in both burns units reveals that there is no complete multidisciplinary medical team presence in both of burn units, and the specialties already found in the burns unit are three only, a burn and plastic surgeon, a nurse and a physiotherapist

The presence of an integrated multi-disciplinary medical team is a corner stone in the pain management protocol's application, where all are committed to their task and bear their responsibilities in front of patients with burns.

Regarding the number of health care providers in both burns units; brighten up to us that there is a severe shortage of all specialties required in the multidisciplinary medical team mainly doctors, nurses and physiotherapist, with complete absence of persistent anesthesiologist and psycho-social worker which have an essential part in burns care.

The result of an assessment checklist of physical environment finds that there is a severe shortage of medical supplies, equipment, and pain management medications especially in the burns unit at the Naser Medical Complex.

Also, the study showed that the uses of non-pharmacological methods according to health care provider practice in both burn units with mean 52.89%, which means that the uses rate of health care provider of non-pharmacological methods in the controlling of pain is moderate and underutilization.

The results showed that there are no statistical differences between knowledge and demographic data (age, marital status, work place, academic qualification, and experience), while there are statistical differences between knowledge and gender, the differences were for male, and the job title for specialist doctor followed by staff nurses.

The study highlighted that there are many obstacles to applying the pain management protocol as physical obstacles which include lack of specialized workplace mainly in Naser medical complex and lack of essential medication, supplies and equipment. Also, there are administrative obstacles as lack of monitoring and supervision about the implementation of the protocol, and lack of support from high-level management.

Furthermore there are professional obstacles included lack of trained and qualified health care provider with severe shortage of them, and lack of multidisciplinary medical team especially lack of persistent anesthesiologist in burns unit.

Other protocol-related constraints are the rigidity of the protocol and its dependence in the treatment of pain on only one type of medication.

Other system-related obstacles as a lot of restrictions when prescribing sedative medications.

5.2 Recommendations

Based on the results and conclusion of our study, the researcher suggests the following recommendations for future implementation:

1- Increasing the awareness of the health care provider about the burn pain management protocol, and provide a training course on how to apply it.
2- Provide sufficient number of health care provider, medication and medical supplies required to implement the protocol.
3- Provide a multidisciplinary health care provider to deal with burns patients, especially anesthesiologists.
4- Adopt managerial policies and to activate the monitoring and supervision role of auditing system in both hospitals to improve health care providers' compliance with the protocol.
5- Accelerate the equipping of the burn unit in Naser medical complex with the necessary medical supplies, equipment, needed medications and qualified health care providers, which will significantly contribute to improving compliance with the application of the burning pain management protocol

5.3 Recommendation for a new area of research

1- A study focusing on and exploring the relationships between socio-demographic variables and burn pain management compliance level.
2- A study concerning about the non-pharmacological pain management and palliative care among burn patients.
3- Qualitative studies about burn patients experience of pain.

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Annexes

Annex 1: Palestinian National Protocols for Burns Care and Management – Burn Pain Management

BURN PAIN MANAGEMENT

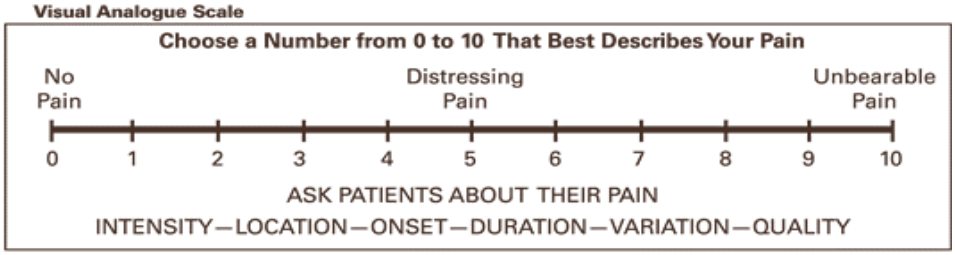
Treatment

The basis for effective pain control is:

- Accurate assessment
- Adequate analgesia: background, procedural and breakthrough
- Appropriate non-pharmacological support
- Continuous evaluation and review of treatment
- Multi-disciplinary approach

For assessment of pain use the following pain assessment tools according to the age and consciousness of the patients

Visual Analogue Scale

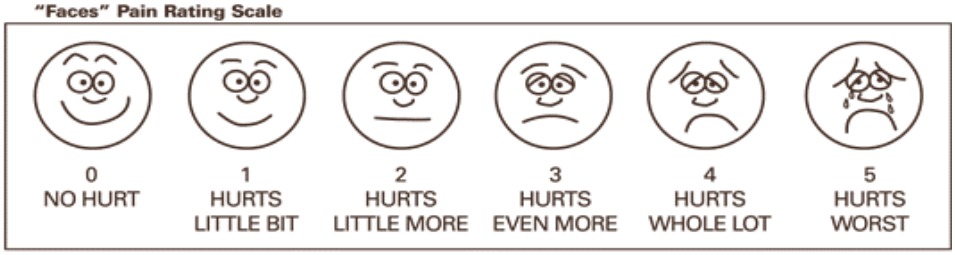


1-3 mild pain

>3 -6 moderate pain

>6 -10 severe pain

"Faces" Pain Rating Scale



1-2 mild pain

3 moderate pain

4-6 severe pain

Behavioral Observation Pain Rating Scale

Categories	Scoring		
	0	1	2
Face	No particular expression or smile; disinterested	Occasional grimace or frown, withdrawn	Frequent to constant frown, clenched jaw, quivering chin
Legs	No position or relaxed	Uneasy, restless, tense	Kicking, or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No crying (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or talking to. Distractable	Difficult to console or comfort
Each of the five categories (F) Face; (L) Legs; (A) Activity; (C) Cry; (C) Consolability is scored from 0-2, which results in a total score between 0 and 10.			

1-3 mild pain

>3 -6 moderate pain

>6 -10 severe pain

Protocol from time of admission

CONSIOUS PATIENT:

1. Asses severity of the pain using the pain scoring tool
2. start management according to the severity (see below)
3. Pain score should be reassessed every 2 hours and medication adjusted accordingly

A- Mild Pain

For ADULT start with:

Paracetamol 1gm X 4

Plus PRN OROMORPH (UP TO 1 hourly)

66- 100kg = 15mg prn 1hrly

45 - 65.5kg = 10mg prn 1hrly

Consider reduced dose for the elderly (>70 yrs)

For CHILDREN start with:

Paracetamol 20gm/kg for 1st dose

Plus PRN oromorph 100mcg/kg

B- Moderate Pain

For ADULT start with:

Paracetamol 1gm X 4

Plus Regular OROMORPH

66- 100kg = 15mg x 4hrly,

45 - 65.5kg = 10mg x 4hrly,

Consider reduced dose for the elderly (>70 yrs)

IF Still in Pain Add

PRN OROMORPH (UP TO I hourly)

OR PRN IBUPRUFEN TAB 600mg (Up TO 8 Hourly)

N.B. Avoid IBUPRUFEN IF PATIENT HAS SIGNSAND SYMPTOMS OF RENAL IMPAIRMENT OR PEPTIC ULCER

For CHILDREN start with:

Paracetamol plus oromorph

If still in pain, use ibubrofen as 100mg/kg Q8 hours for children older than 6 months OR Diclofenac in children older than 1 year.

C- SEVERE PAIN

For ADULT start with:

- Morphine IV bolus 0.05 mg/kg followed by
- Morphine IV INFUSION 1-5 mg / hour
- PRN PARACETAMOL 1gm (up to 6 hourly)
- Or PRN IBUBRUFEN 600mg (up to 8 hourly)
- N.B. MONITOR RESPIRATORY RATE AND BLOOD PREESURE
- IF RR < 10 or SBP < 90 stop morphine infusion

For CHILDREN start with:

Give morphin 100mcg/kg IV every 3-4 hours

Fentanyl 1-2 mcg/kg IV up to hourly (if indicated)

FOR ADULT (INTUBATED PATIENT)

1. Asses severity of the pain using the pain scoring tool
2. start management according to the severity (see below)
3. Pain score should be reassessed every 1 hours and adjust medication accordingly
4. Asses sedation score hourly and add sedation to keep the sedation score

A- For mild pain start with: (Through NGTube)

Paracetamol 1gm X 4

Plus PRN OROMORPH (UP TO 1 hourly)

66- 100kg = 15mg prn 1hrly

45 - 65.5kg = 10mg prn 1hrly

Consider reduced dose for the elderly (>70 yrs)

B- For Moderate to Severe Pain

- IV MORPHINE: IV bolus 0.05 mg/kg followed by
- Morphine IV INFUSION 1-10 mg / hour

  Or
- Fentanyl infusion 0.7-10 MCG/KG/Hr

For Sedation

1. Midazolam infusion 10-100 Microgram/kg/hour (1-10mg/hour)

Or

2. Propafol Infusion (FOR PATIENT ABOVE 18 years ONLY) 0.3-4

mg/kg/hour

N.B.

- Do Not start sedation infusion if patient is hypotensive (stabilize the patient hemodynamic before starting)
- Stop Sedation if patient develop hypotension or arrhythmias
- Do not start Propafol for children (below 18 years) as ICU sedation

For CHILDREN:

- Midazolam: 0.1-0.2 mg/kg/dose
- Ketamine: 0.5-1 mg/kg slow IV or orally, 2-4 mg/kg injection
- Chloral hydrte: 20-50 mg/kg/dose Q6 hours
- Triclonam: 1cc/kg PO
- Promethazine: 1-2 mg/kg/dose Q6 hours

Annex 2: Palestine Map

Source: (PCBS, 2019)

Annex 3: Distribution of GG

Source: (PCBS, 2018a)

Annex 4: Behavioral Pain Assessment Scale

FLACC Behavioral Pain Assessment Scale

CATEGORIES	SCORING		
	0	1	2
Face	No particular expression or smile	Occasional grimace or frown; withdrawn, disinterested	Frequent to constant frown, clenched jaw, quivering chin
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs; frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to; distractable	Difficult to console or comfort

How to Use the FLACC

In patients who are awake: observe for 1 to 5 minutes or longer. Observe legs and body uncovered. Reposition patient or observe activity. Assess body for tenseness and tone. Initiate consoling interventions if needed.

In patients who are asleep: observe for 5 minutes or longer. Observe body and legs uncovered. If possible, reposition the patient. Touch the body and assess for tenseness and tone.

Face

- Score 0 if the patient has a relaxed face, makes eye contact, shows interest in surroundings.
- Score 1 if the patient has a worried facial expression, with eyebrows lowered, eyes partially closed, cheeks raised, mouth pursed.
- Score 2 if the patient has deep furrows in the forehead, closed eyes, an open mouth, deep lines around nose and lips.

Legs

- Score 0 if the muscle tone and motion in the limbs are normal.
- Score 1 if patient has increased tone, rigidity, or tension; if there is intermittent flexion or extension of the limbs.
- Score 2 if patient has hypertonicity, the legs are pulled tight, there is exaggerated flexion or extension of the limbs, tremors.

Activity

- Score 0 if the patient moves easily and freely, normal activity or restrictions.
- Score 1 if the patient shifts positions, appears hesitant to move, demonstrates guarding, a tense torso, pressure on a body part.
- Score 2 if the patient is in a fixed position, rocking; demonstrates side-to-side head movement or rubbing of a body part.

Cry

- Score 0 if the patient has no cry or moan, awake or asleep.
- Score 1 if the patient has occasional moans, cries, whimpers, sighs.
- Score 2 if the patient has frequent or continuous moans, cries, grunts.

Consolability

- Score 0 if the patient is calm and does not require consoling.
- Score 1 if the patient responds to comfort by touching or talking in 30 seconds to 1 minute.
- Score 2 if the patient requires constant comforting or is inconsolable.

Whenever feasible, behavioral measurement of pain should be used in conjunction with self-report. When self-report is not possible, interpretation of pain behaviors and decisions regarding treatment of pain require careful consideration of the context in which the pain behaviors are observed.

Interpreting the Behavioral Score

Each category is scored on the 0–2 scale, which results in a total score of 0–10.

0 = Relaxed and comfortable
1–3 = Mild discomfort
4–6 = Moderate pain
7–10 = Severe discomfort or pain or both

Annex 5: Study activity time table

Activity	Duration	2018							2019								
		6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9
Proposal writing	1 month																
Proposal defense	1 month																
Expert committee check for validity	3 month																
Pilot Study	1 month																
Modifications	1 month																
Data collection	2 month																
Data Entry	2 month																
Data Analysis	2 month																
Research writing	4 months																

Annex 6: List of arbitrators

	Name
1.	Dr. Yehia Abed
2.	Dr. Bassam Abu Hamad
3.	Dr. Khitam Abu Hamad
4.	Dr. Nafiz abu Shaban
5.	Dr. Ahmed Al moghrabi
6.	R.N. Naser hammad
7.	Dr. Ahmed Abu Yassin
8.	Dr. Medhat Saidam
9.	R.N. Mohammed Khaled
10.	Dr. Hassan Hamdan

Annex 7: The study questionnaire in English

QUESTIONNAIRE

Dear Participant,

My name is **Yousuf I. Al shami**. I am a student at the School of Public Health - Al-Quds University pursuing a Master's degree in Health management. I am carrying out a research on **"Compliance with Burn Pain Management Protocol in Governmental Hospitals – Gaza Strip"** The research has been approved by the Ethics and Research Committee in Gaza and permission to carry out the research granted by the designated hospitals.

In order to obtain the information, I have developed a questionnaire. I am kindly requesting you to participate in the study by filling in the questionnaire, The time needed to fill the questionnaire will not exceed 15 minutes. Participation is voluntary and there is no penalty for declining to participate. There are no risks involved in participating in this study. The information you provide will be treated with confidentiality as permitted by law. You are not required to write your name or any other identification number on the study questionnaire. The results of the study will enable policy makers to evaluate the compliance with the burn pain management protocol. The results of the study will be availed to you after the study is completed in case you wish to know the findings. You may ask any questions about your rights as a participant or anything else about the research that is not clear. Your participation will be highly appreciated.

In case of any questions or clarifications, feel free to contact me on mobile number 0592160200.

Thank you

Researcher

Yousuf Ismael Al shami

❖ **INSTRUCTIONS**

- Please do not leave any question unanswered.
- Please place a check mark in the check boxes provided.

❖ **QUESTIONNAIRES**

Ser. N. ---------- Please answer the following questions:

❖ **Personal and professional information**					
1	Gender	Male		Female	
2	Age in years ---------- year				
3	Marital status	Single	Married	Divorced	Widowed
4	Workplace (Burn unit in…)	Alshifa Medical Complex		Naser Medical complex	
5	**Job Titles**	1- Specialist Doctor		2- General Physician	
		3- Staff Nurse		4- Practical Nurse	
6	**Academic Qualification**	Doctorate (Ph.D.)		Master	
		High diploma		Bachelor	
		Diploma		Others _____	
7	Years of experience in burn unit - - - - - - - -year				
Assessment of medical staff knowledge level about burn pain management protocol.					
8	Did you hear about the universal standard precautions of burn pain management?			1. Yes 2. No 3. I don't know	
9	Are you aware if there is Palestinian national protocols for burns care and management?			1- Yes 2- No 3- I don't know	
10	**If the answer is YES**, Have you seen it?			1. Yes 2. No 3. I don't know	
11	Do you have a copy of the protocol?			1. Yes 2. No 3. I don't know	
12	If there is a copy, where it is?	1- Medication room	2- Supervisor nurse room		
		3- Physicians room	4- Staff nurse room		
		5- Home	6- Others		
13	Did you read it?			1- Yes 2- No 3- I don't know	
14	Does the protocol contain the burn pain management?			1- Yes 2- No 3- I don't know	
15	Have you received any training course about the protocol?			1- Yes 2- No 3- I don't know	
16	IF YES, Do you feel that you have sufficient information at that training?			1- Yes 2- No 3- I don't know	

17	Is there periodic training or review to follow the implementation of the Protocol?	1- Yes 2- No 3- I don't know
18	When was the last training?	_____ year
19	Do you think that the practice of medical procedures in an effort to control patient pain is based on what is stated in the protocol?	**1-** Yes **2-** No **3-** I don't know
20	Is there a follow-up by the management to ensure the implementation of the protocol?	**1-** Yes **2-** No **3-** I don't know
21	Does the management follow the style of reward and punishment in applying the protocol?	**1-** Yes **2-** No **3-** I don't know
22	Is there a documentation confirming your commitment to implementing the Protocol?	**1-** Yes **2-** No **3-** I don't know
23	Do you use a measuring instrument (pain scale) to assess pain intensity in patients?	**1-** Yes **2-** No **3-** I don't know
24	Do you have knowledge of the visual analogue scale to assess the pain?	**1-** Yes **2-** No **3-** I don't know
25	Do you know how to use it?	**1-** Yes **2-** No **3-** I don't know
26	According to the visual analogue scale, the degree of pain from 3 to 6 is considered severe pain?	**1-** Yes **2-** No **3-** I don't know
27	Do you know the face pain rating scale?	**1-** Yes **2-** No **3-** I don't know
28	Do you know how to use it?	**1-** Yes **2-** No **3-** I don't know
29	According to the face pain rating scale, this facial shape  indicates mild pain?	**1-** Yes **2-** No **3-** I don't know
30	Do you know the Behavioral Observation Pain Scale?	**1-** Yes **2-** No **3-** I don't know
31	Do you know how to use it?	**1-** Yes **2-** No **3-** I don't know

32	According to the behavioral observation pain scale, the degree of pain is assessed by 5 determinants: face, legs, activity, crying, and consolability?.	**1-** Yes **2-** No **3-** I don't know
33	If the patient is conscious the pain is assessed every two hours and the treatment adjusted accordingly?	**1-** Yes **2-** No **3-** I don't know
34	In the event that the patient is an adult conscious and suffering from mild pain, he/she is given Paracetamol + Oromorph S.O.S?	**1-** Yes **2-** No **3-** I don't know
35	If the patient is a conscious child and suffers from mild pain, Paracetamol 20mg / kg + Oromorph 100 microgram (mcg) / kg is given?	**1-** Yes **2-** No **3-** I don't know
36	If the patient is a conscious adult and suffers from moderate pain, Paracetamol + Oromorph is given regularly?	**1-** Yes **2-** No **3-** I don't know
37	Based on the previous question, if the pain persists, an additional dose of Oromporph Or Ibuprofen Tab is given?	**1-** Yes **2-** No **3-** I don't know
38	If the patient is a conscious child suffering from moderate pain, Paracetamol + Oromorph is given. If the pain continues, Ibuprofen is added?	**1-** Yes **2-** No **3-** I don't know
39	If the patient is an adult and suffers from severe pain, Morphine IV INFUSION is given?	**1-** Yes **2-** No **3-** I don't know
40	Is the morphine IV safe and does not affect respiratory rate and blood pressure?	**1-** Yes **2-** No **3-** I don't know
41	In case of severe pain is allowed to give Fentanyl to adults but not children?	**1-** Yes **2-** No **3-** I don't know
42	If the patient is an "Intubated", Propofol is given as an anesthetic for patients under the age of 18 years?	**1-** Yes **2-** No **3-** I don't know
43	Is there a multidisciplinary medical team to deal with a burns patient?	**1-** Yes **2-** No **3-** I don't know

44	In your opinion, what are the top 5 obstacles facing the application of pain management protocol in patients with burns? - _____ - _____ - _____ - _____ - _____
45	Suggest 5 suggestions for improving the commitment of staff to implement the protocol? - _____ - _____ - _____ - _____ - _____
46	What types of non-pharmacological analgesics that used for burns patients?

	Non-pharmacological analgesics	**Seldom 0-25%**	**Sometime 25-50%**	**Often 50-75%**	**most of the time 75-100$**
1	Limb elevation				
2	Minimize the number of dressing changes				
3	Distraction				
4	Relaxation exercise				
5	Imagery				
6	Air conditioning				
7	Music therapy				
8	Spiritual Therapy (reading Quran, praying, athkar, etc.)				

Thank you

Annex 8: The study questionnaire in Arabic

زملائي وزميلاتي الأعزاء،

أنا الباحث يوسف اسماعيل الشامي، طالب ماجستير في كلية الصحة العامة تخصص ادارة صحية في جامعة القدس أبو ديس، أقوم بإجراء بحث حول **"تقييم مدى الالتزام بتطبيق بروتوكول إدارة الألم لدى مرضى الحروق في المستشفيات الحكومية ـ قطاع غزة"**، وقد تم أخذ الموافقة على البحث من قبل لجنة الأخلاقيات والبحوث بوزارة الصحة لإجراء البحث في المستشفيات المعنية.

من أجل ذلك قمت بعمل استبيان، أرجو منكم المشاركة في الدراسة من خلال تعبئة الاستبيان، والذي ولن يتجاوز الوقت اللازم لتعبئته ال 15 دقيقة. المشاركة طوعية وليس هناك عقوبة على رفض المشاركة. لا توجد مخاطر مترتبة على المشاركة في هذه الدراسة، وسيتم التعامل مع المعلومات التي تقدمها بسرية وفقًا لما يسمح به القانون، مع العلم أنه لست ملزمًا بكتابة اسمك أو أي رقم تعريف آخر في استبيان الدراسة. سوف تمكن نتائج الدراسة صانعي القرار من تقييم مدى الامتثال لبروتوكول إدارة الألم لدى مرضى الحروق، ويمكنك الاستفادة من نتائج الدراسة بعد الانتهاء منها في حال كنت ترغب في معرفة النتائج.

يمكنك طرح أي أسئلة حول حقوقك كمشارك أو أي شيء غير واضح في البحث. مشاركتك ستكون محل تقدير كبير.

في حال أي استفسار أو استيضاح، لا تتردد بالتواصل معي على جوال رقم 0592160200.

شكراً لك

الباحث

يوسف اسماعيل الشامي

❖ **تعليمات /**

- **الرجاء عدم ترك أي سؤال بدون اجابة**
- **ضع علامة في الصندوق الذي تتوافق معه**

❖ **الاستبانة /**

الرجاء الاجابة على الاسئلة التالية: **الرقم التسلسلي:**_____

❖ **البيانات الشخصية والمهنية:**					
1	الجنس/	ذكر ☐	أنثى ☐		
2	العمر بالسنوات /	_____ سنة			
3	الحالة الاجتماعية	أعزب/ة ☐	متزوج/ة ☐	مطلق/ة ☐	أرمل/ة ☐
4	مكان العمل (وحدة الحروق في مستشفى)	مجمع الشفاء الطبي ☐	مجمع ناصر الطبي ☐		
5	المسمى الوظيفي	طبيب متخصص ☐	طبيب عام ☐		
		حكيم جامعي ☐	ممرض عملي ☐		
6	المؤهل العلمي	دكتوراه ☐	ماجستير ☐		
		دبلوم عالي ☐	بكالوريوس ☐		
		دبلوم ☐	أخرى: _____		
7	سنوات الخبرة في وحدة الحروق	_____ سنة			

❖ **تقييم مستوى معرفة الفريق الطبي ببروتوكول علاج الألم لدى مرضى الحروق:**				
8	هل لديك معرفة حول وجود معايير دولية لعلاج الألم لدى مرضى الحروق؟	**1- نعم** **2- لا** **3- لا أعرف**		
9	هل لديك معرفة حول وجود بروتوكول وطني لرعاية ومعالجة الحروق في فلسطين؟	**1- نعم** **2- لا** **3- لا أعرف**		
10	اذا كانت الاجابة نعم، هل رأيته؟	**1- نعم** **2- لا** **3- لا أعرف**		
11	هل لديك نسخة من هذا البروتوكول؟	**1- نعم** **2- لا** **3- لا أعرف**		
12	اذا كان لديك نسخة، أين تحتفظ بها؟	**- غرفة العلاجات** ☐	**- غرفة مشرف التمريض** ☐	
		- غرفة الأطباء ☐	**- غرفة التمريض** ☐	
		- المنزل ☐	**- أماكن أخرى** _____	
13	هل اطلعت عليه؟	**1- نعم** **2- لا** **3- لا أعرف**		
14	هل يحتوي البروتوكول على جزئية إدارة ومعالجة آلام الحروق؟	**1- نعم** **2- لا** **3- لا أعرف**		
15	هل تلقيت دورة تدريبية حول البروتوكول وكيفية تطبيقه؟	**1- نعم** **2- لا** **3- لا أعرف**		

16	إذا كانت الإجابة "نعم" ، هل تشعر أن لديك معلومات كافية في هذا التدريب؟	**1- نعم** **2- لا** **3- لا أعرف**
17	هل هناك تدريب أو مراجعة دورية لمتابعة تطبيق البروتوكول؟	**1- نعم** **2- لا** **3- لا أعرف**
18	متى كان آخر مراجعة أو تدريب على البروتوكول؟	_____ سنة
19	هل تعتقد أن ما يُمارس من اجراءات طبية في محاولة للسيطرة على آلام المرضى مبني على ما ورد في البروتوكول؟	**1- نعم** **2- لا** **3- لا أعرف**
20	هل هناك متابعة من قبل الادارة لضمان تطبيق البروتوكول؟	**1- نعم** **2- لا** **3- لا أعرف**
21	هل الادارة تتبع اسلوب الثواب والعقاب في تطبيق البروتوكول؟	**1- نعم** **2- لا** **3- لا أعرف**
22	هل هناك توثيق يؤكد التزامك بتطبيق البروتوكول؟	**1- نعم** **2- لا** **3- لا أعرف**
23	هل تقوم باستخدام اداة قياس لتقييم شدة الألم عند المرضى؟	**1- نعم** **2- لا** **3- لا أعرف**
24	هل لديك معرفة بمقياس التماثل البصري visual analogue scale لقياس شدة الألم؟	**1- نعم** **2- لا** **3- لا أعرف**
25	هل تعرف طريقة استخدامه؟	**1- نعم** **2- لا** **3- لا أعرف**
26	حسب مقياس التماثل البصري visual analogue scale تعتبر درجة الألم من 3-6 ألم شديد؟	**1- نعم** **2- لا** **3- لا أعرف**
27	هل لديك معرفة بمقياس تقييم الألم بالوجوه face pain rating scale؟	**1- نعم** **2- لا** **3- لا أعرف**
28	هل تعرف طريقة استخدامه؟	**1- نعم** **2- لا** **3- لا أعرف**
29	حسب مقياس تقييم الالم بالوجوه فإن شكل الوجه هذا يعبر عن ألم معتدل mild  pain؟	**1- نعم** **2- لا** **3- لا أعرف**
30	هل لديك معرفة بمقياس تقدير الألم حسب ملاحظة السلوك Behavioral Observation Pain Scale ؟	**1- نعم** **2- لا** **3- لا أعرف**
31	هل تعرف طريقة استخدامه؟	**1- نعم** **2- لا** **3- لا أعرف**
32	حسب مقياس تقدير الألم بملاحظة السلوك يتم تقييم درجة الألم من خلال 5 محددات وهي الوجه والأرجل والنشاط والبكاء وقابلية المواساة؟	**1- نعم** **2- لا** **3- لا أعرف**

33	في حال كان المريض واعي يتم تقييم الألم كل ساعتين وتعديل العلاج وفقاً لذلك؟	**1- نعم** **2- لا** **3- لا أعرف**
34	في حال كان المريض شخص بالغ واعي ويعاني من ألم معتدل "Mild" يتم اعطاءه Paracetamol + Oromorph S.O.S؟	**1- نعم** **2- لا** **3- لا أعرف**
35	في حال كان المريض طفل واعي ويعاني من ألم معتدل "Mild" يتم اعطاءه Paracetamol 20mg/kg + Oromorph 100 mcg/kg?	**1- نعم** **2- لا** **3- لا أعرف**
36	في حال كان المريض شخص بالغ واعي ويعاني من ألم متوسط "Moderate" يتم اعطاءه Paracetamol + Oromorph بانتظام؟	**1- نعم** **2- لا** **3- لا أعرف**
37	بناءً على السؤال السابق، في حال استمر الألم يتم اعطاء المريض جرعة إضافية من Oromorph Or Ibuprofen Tab.؟	**1- نعم** **2- لا** **3- لا أعرف**
38	في حال كان المريض طفل واعي ويعاني من ألم موسط "Moderate" يتم اعطاءه Paracetamol + Oromorph وفي حال استمر الألم يتم اضافة Ibuprofen؟	**1- نعم** **2- لا** **3- لا أعرف**
39	في حالة كان المريض شخص بالغ ويعاني من ألم شديد "Sever Pain" يتم اعطاءه Morphine INFUSION وريدي؟	**1- نعم** **2- لا** **3- لا أعرف**
40	دواء Morphine الوريدي يعتبر آمن ولا يؤثر على معدل التنفس وضغط الدم؟	**1- نعم** **2- لا** **3- لا أعرف**
41	في حالة الالم الشديد يسمح بإعطاء Fentanyl للبالغين ولا يعطى للأطفال؟	**1- نعم** **2- لا** **3- لا أعرف**
42	في حال كان المريض على جهاز تنفس صناعي "Intubated Patient" يتم اعطاء Propofol كمخدر للمرضى أقل من سن 18 سنة؟	**1- نعم** **2- لا** **3- لا أعرف**
43	هل هناك فريق طبي متعدد التخصصات للتعامل مع مرضى الحروق؟	**1- نعم** **2- لا** **3- لا أعرف**
44	من وجهة نظرك ما هي أهم 5 معيقات تواجه تطبيق بروتوكول ادارة الألم لدى مرضى الحروق؟ - _____ - _____ - _____ - _____ - _____	
45	اقترح 5 اقتراحات لتحسين التزام العاملين بتطبيق البروتوكول؟ - _____ - _____ - _____ - _____ - _____	

46 حسب الجدول التالي ما هي أنواع المسكنات الغير دوائية non-pharmacological analgesics المستخدمة مع مرضى الحروق للسيطرة على آلامهم؟

م.	المسكنات الغير دوائية	نادراً 0-25%	أحياناً 25-50%	غالباً 50-75%	معظم الوقت 75-100%
1	رفع الأطراف أعلى من مستوى الجسم Limb elevation				
2	تقليل عدد الغيارات على الحروق Minimize the number of dressing changes				
3	الإلهاء Distraction				
4	تمارين الاسترخاء Relaxation exercise				
5	التخيل Imagery				
6	المكيف الهوائي Air conditioning				
7	الاستماع الى الموسيقى Music therapy				
8	العلاج الروحي (قراءة القرآن، الصلاة، الأذكار.. إلخ) Spiritual Therapy				

شكراً لتعاونك..

Annex 9: Compliance checklist

Instructions:

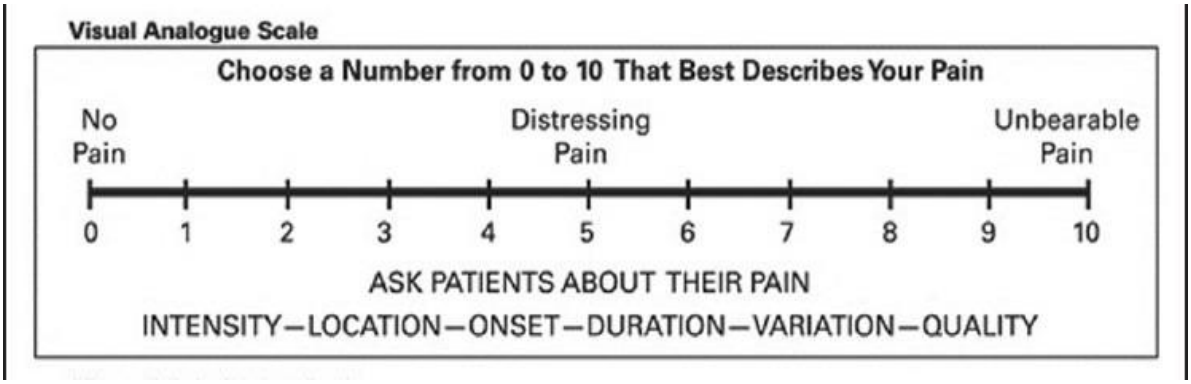
- Filling the following Observation checklist depends on the consciousness level and pain severity.

Date: _____ Name:_____

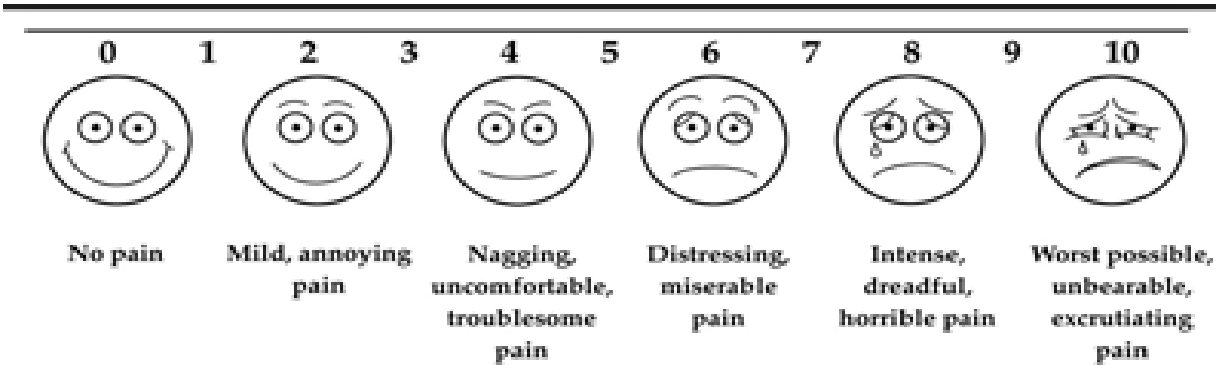
Workplace (Burn unit in…)	Alshifa Medical Complex ☐	Naser Medical complex ☐	
Observation number: _____	File number: _____	Patient Age: _____year	
Conscious status:	Conscious ☐	Unconscious "Intubated" ☐	
Pain level:	Mild ☐	Moderate ☐	Severe ☐

Conscious Patient:			
No.	**Item**	**Yes**	**No**
1.	The severity of the pain is assessed by using the Visual Analogue Scale Or "Faces" Pain Rating Scale		
2.	The patient has mild pain and has been given Paracetamol + Oromorph S.O.S		
3.	The patient has moderate pain and has been given Paracetamol + Oromorph regularly.		
4.	The patient suffers from severe pain and has been given Morphin IV or Infusion		
5.	The pain is reassessed every two hours		
6.	Non-pharmacological support methods are used to control pain		
7.	Documentation was performed regarded:		
	e- Pain assessment		
	f- Drug description		
	g- Patient response		
	h- Pain reassessment		
Unconscious Patient (Intubated):			
8.	The pain is assessed using the Behavioral Observation Pain Rating Scale		
9.	The patient has mild pain and was given Paracetamol + Oromorph S.O.S		
10.	The patient suffers from moderate to severe pain and has been given Morphin IV or Fentanyl IV		
11.	The intensity of the pain is reassessed every one hour		
12.	The sedation score is evaluated every hour		
13.	Documentation was performed regarded:		
	a- Pain assessment		
	b- Drug description		
	c- Patient response		
	d- Pain reassessment		
	e- Sedation score		

Visual Analogue Scale



Face Pain Rating Scale



FLACC Behavioral Pain Assessment Scale:

Table 2

The FLACC Scale

Categories	0	1	2
Face	No particular expression or smile	Occasional grimace or frown, withdrawn, disoriented	Frequent to constant frown, quivering chin, clenched jaw
Legs	Normal position or relaxed	Uneasy, restless, tense	Kicking or legs drawn up
Activity	Lying quietly, normal position, moves easily	Squirming, shifting back and forth, tense	Arched, rigid, or jerking
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaint	Crying steadily, screams or sobs, frequent complaints
Consolability	Content, relaxed	Reassured by occasional touching, hugging, or being talked to; distractible	Difficult to console or comfort

Source: Reference 20.

Annex 10: Assessment checklist of physical environment

<table>
<tr><th>No.</th><th>Item</th><th>Applied</th><th>Not applied</th></tr>
<tr><td>1.</td><td>There is enough copy of the Palestinian National Protocol for Burns Care and Management in the burn unit.</td><td></td><td></td></tr>
<tr><td>2.</td><td>There is a multidisciplinary team in the burn unit.</td><td></td><td></td></tr>
<tr><td>3.</td><td>There are hard copies of pain assessment tools ready for use.</td><td></td><td></td></tr>
<tr><td>4.</td><td colspan="3">Who of the following multidisciplinary team is available in burn unit?
<table>
<tr><th></th><th>Specialty</th><th>Often</th><th>Sometimes</th><th>Not available</th><th>How many?</th><th>Is adequate number & sufficient to work load?</th></tr>
<tr><td>1</td><td>Burn and Plastic Surgeons</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Anesthesiologists</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>Nurses</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Physical and occupational therapists</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>Nutritionists</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>6</td><td>Psychosocial experts</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>7</td><td>Pharmacist</td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>8</td><td>Physiotherapist</td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>5.</td><td colspan="3">The medical supplies for pain management are available like:
<table>
<tr><th></th><th></th><th>Insufficient 0-25%</th><th>Sometime 25-50%</th><th>Often 50-75%</th><th>Most of the time 75-100%</th></tr>
<tr><td>1</td><td>Medications</td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>Emergency trolley</td><td></td><td></td><td></td><td></td></tr>
<tr><td>3</td><td>Monitor machine</td><td></td><td></td><td></td><td></td></tr>
<tr><td>4</td><td>Oxygen source</td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>6.</td><td colspan="3">Are the following drugs listed in the protocol available continuously or at least the last 6 months:</td></tr>
</table>

			Medication	**Insufficient 0-25%**	**Sometime 25-50%**	**Often 50-75%**	**Sufficient most of the time 75-100%**
		1	Paracetamol				
		2	Oromorph				
		3	Morphine				
		4	Ibuprofen				
		5	Promethazine				
		6	Fentanyl				
7.	There are supportive policies to ensure the application of the pain management protocol.						
8.	The results of pain assessment and the interventional pain management consistently documented in the health record.						

Annex 11: Key Informant Interview questions

1. What are the services provided to burn patients in the GS? How you perceive this service?
2. What are the good things and bad things in these services (reflect on human resources, equipment, standards)
3. How much care is standardized and done in the same way?
4. What about the availability of protocol? What do you think about it? How it was developed?
5. What about its use? How much staff is aware about it?
6. What is the purpose of this protocol?
7. Who is responsible for the dissemination of this Protocol?
8. Have certain mechanisms been followed to disseminate the Protocol? What are the mechanisms? (Courses - Workshop - Lecture - Circular - ...)
9. What about training? Formal and informal
10. How much management structure and arrangements are supportive to the protocols implementations?
11. What about supervision for protocol implementation?
12. Elaborate more about the implementation of the protocol, how much it is being used, who uses it more
13. The results found that the percentage of knowledge of the protocol is below the average of 45%, in your opinion what is the reason behind this / what is your interpretation of that?
14. In your opinion, to what extent are employees committed to the implementation of the pain management protocol?
15. The results showed that the compliance rate of the Protocol is very low 12.4%, which explains this?
16. To what extent do the demographic characteristics of the study participants affect the level of commitment to the application of the Protocol
17. What are the barriers for the implementation and use of protocols?
18. What might encourage the implementation of protocols?

Annex 12: KII participants

Workplace	Job Titles	position
Al Shifa medical complex burns unit	Specialist doctor	Head of Burns and Plastic Surgery Department and Consultant of plastic surgery and burns
Al Shifa medical complex burns unit	Staff nurse	nursing Supervisor of burns unit
Al Shifa medical complex burns unit	Staff nurse	Head of Burns Department
Naser medical complex burns department	Specialist doctor	Head of Burns and Plastic Surgery Department and Consultant of plastic surgery and burns
Naser medical complex burns department	Staff nurse	Former Head of Burns Unit and Supervisor of Continuing Education Department

Annex 13: An official letter of approval from Helsinki Committee

المجلس الفلسطيني للبحث الصحي

Palestinian Health Research Council

تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار

Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee
For Ethical Approval

Date: 2018/06/04 **Number:** PHRC/HC/391/18

Name: Yousuf Ismael Alshami الاسم:

We would like to inform you that the committee had discussed the proposal of your study about:

نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Compliance with Burn Pain Management Protocol in Governmental Hospitals - Gaza Strip

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/391/18 in its meeting on 2018/06/04

و قد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member **Member**

Chairman

Genral Conditions:-

1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-

E-Mail:pal.phrc@gmail.com

Gaza - Palestine غزة - فلسطين

شارع النصر - مفترق العيون

Annex 14: Administrative Approval

State of Palestine
Ministry of health

دوله فلسطين
وزارة الصحة

التاريخ:20/12/2018
رقم المراسلة 270208

السيد : رامي عيد سليمان العبادله المحترم

مدير عام بالوزارة /الإدارة العامة لتنمية القوى البشرية - /وزارة الصحة

السلام عليكم ,,,

الموضوع/ تسهيل مهمة الباحث// يوسف الشامي

التفاصيل //
بخصوص الموضوع أعلاه، يرجى تسهيل مهمة الباحث/ **يوسف اسماعيل الشامي**
الملتحق ببرنامج ماجستير الصحة العامة – مسار الإدارة الصحية – جامعة القدس أبوديس بغزة في إجراء بحث بعنوان:-
"Compliance with Burn Pain Management Protocol in Governmental Hospitals in the Gaza Strip"
حيث الباحث بحاجة لتعبئة استبانة من عدد من مقدمي الخدمات الصحية لمرضى الحروق في مجمع ناصر الطبي ومجمع الشفاء الطبي وكذلك بعض الاحصائيات الخاصة بالحروق من وحدة نظم المعلومات، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي، ودون تحمل الوزارة أي أعباء أو مسئولية.
وتفضلوا بقبول التحية والتقدير،،،
ملاحظة / تسهيل المهمة الخاص بالدراسة أعلاه صالح لمدة 6 شهر من تاريخه.

محمد ابراهيم محمد السرساوي
مدير دائرة/الإدارة العامة لتنمية القوى البشرية -

التحويلات

* محمد ابراهيم محمد السرساوي(مدير دائرة) ← رامي عيد سليمان العبادله(مدير عام بالوزارة) إجراءاتكم بالخصوص(20/12/2018)

Gaza Tel. (+970) 8-2846949 Fax. (+970) 8-2826295
غزة تلفون. 8-2846949 (+970) فاكس. 8-2826295 (+970)

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ:2018/12/19

حضرة الدكتور/ رامي العبادلة المحترم
مدير عام تنمية القوى البشرية–وزارة الصحة

تحية طيبة وبعد،،،

الموضوع: مساعدة الطالب يوسف الشامي

نشكر لكم دعمكم الدائم لمسيرة العلم والتعليم وخصوصاً دعم كلية الصحة العامة وطلابها، ونود أعلامكم بأن الطالب المذكور أعلاه سيقوم بعمل بحث كمتطلب للحصول على درجة الماجستير في الصحة العامة–مسار الإدارة الصحية بعنوان:

"Compliance with Burn Pain Management Protocol in Governmental Hospitals in the Gaza Strip"

وعليه نرجو التكرم بالموافقة على تسهيل مهمة الطالب في إنجاز هذا البحث حيث سيقوم بجمع البيانات من خلال تعبئة استبانه من الكادر الطبي (أطباء وتمريض) العمالين في وحدة الحروق في مجمعي الشفاء الطبي ومجمع ناصر الطبي التابعة لوزارة الصحة.

وكذلك بيانات من قسم مركز تكنولوجيا المعلومات في المجمعين

و اقبلوا فائق التحية و الاحترام،،،

د. بسام أبو حميد
منسق عام برامج الصحة العامة
فرع غزة

نسخة:
- الملف

Jerusalem Branch/Telefax 02-2799234
Gaza Branch/Telefax 08-2644220 -2644210
P.O. box 51000 Jerusalem

فرع القدس / تلفاكس 02-2799234
فرع غزة / تلفاكس 08-264420-2644210
ص.ب. 51000 القدس

Annex 15: Post-hock test (scheffe) for job title

Multiple Comparisons

Dependent Variable: Knowledge

Scheffe

(I) Job Titles of participant	(J) Job Titles of participant	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Specialist Doctor	General Physician	17.90123	15.82802	.735	-27.9231-	63.7256
	Staff Nurse	8.51426	7.72570	.750	-13.8527-	30.8813
	Practical Nurse	26.87559*	8.77980	.034	1.4568	52.2944
General Physician	Specialist Doctor	-17.90123-	15.82802	.735	-63.7256-	27.9231
	Staff Nurse	-9.38697-	14.80244	.939	-52.2421-	33.4682
	Practical Nurse	8.97436	15.37890	.952	-35.5497-	53.4985
Staff Nurse	Specialist Doctor	-8.51426-	7.72570	.750	-30.8813-	13.8527
	General Physician	9.38697	14.80244	.939	-33.4682-	52.2421
	Practical Nurse	18.36133	6.75803	.074	-1.2041-	37.9268
Practical Nurse	Specialist Doctor	-26.87559-*	8.77980	.034	-52.2944-	-1.4568-
	General Physician	-8.97436-	15.37890	.952	-53.4985-	35.5497
	Staff Nurse	-18.36133-	6.75803	.074	-37.9268-	1.2041

*. The mean difference is significant at the 0.05 level.

Annex 16: Arabic translation for the Abstract

العنوان: الالتزام بتطبيق بروتوكول علاج آلام الحروق في المستشفيات الحكومية – قطاع غزة

إعداد : يوسف اسماعيل الشامي

إشراف: د. أشرف يعقوب الجدي

ملخص الدراسة

يعتبر علاج الألم بشكل كافٍ مطلباً عالميًا في مجال الرعاية الصحية. حيث أن سوء علاج الألم يمكن أن يؤدي إلى تدنٍ ملحوظ في النتائج الجسدية والنفسية، وكذلك انخفاض في جودة الحياة الإجمالية للمرضى، والإدمان، كما وأنه يبطئ عملية التئام الجروح وشفائها مما يؤدي إلى قضاء فترة طويلة في المستشفى، وزيادة النفقات وتكلفة الخدمات الصحية. لذا فإن العلاج الفعّال للألم يؤدي إلى تحسين النتائج وزيادة الرضا لدى المريض. ولأهمية ذلك تم وضع البروتوكولات الوطنية لرعاية ومعالجة الحروق في فلسطين في عام 2012م، حيث تم وضع معايير وآليات للتعامل مع الألم الناجم عن الحروق.

الهدف من الدراسة

تهدف هذه الدراسة إلى تقييم الالتزام بتطبيق البروتوكول الفلسطيني لعلاج آلام الحروق في المستشفيات الحكومية في محافظات غزة من أجل تحسين جودة الرعاية المقدمة لمرضى الحروق، وكذلك تحسين جودة حياة المرضى.

منهجية الدراسة

في هذه الدراسة تم استخدام التصميم الوصفي التحليلي المستعرض، وكذلك مقاربة مثلثية تستخدم كل من الأدوات الكمية والنوعية. وقد شمل مجتمع الدراسة جميع مقدمي الرعاية الصحية من الأطباء والممرضين العاملين في مركز عدنان العلمي لعلاج الحروق في مجمع الشفاء الطبي وقسم الحروق في مجمع ناصر الطبي، وقد بلغ عددهم تسعة وخمسين مشاركًا، وكان معدل الاستجابة 89.8%.

تم استخدام أربع أدوات بحثية لجمع البيانات. تم جمع البيانات الكمية بواسطة ثلاث أدوات: أولها عبارة عن استبيان لدراسة مستوى معرفة المشاركين، والتدريب حول البروتوكول، والعوامل الاجتماعية والديموغرافية التي تؤثر على مستوى معرفة المشاركين، وكذلك المعيقات أمام تطبيق بروتوكول علاج الألم. أما الأداة الثانية فهي قائمة التحقق من تطبيق مقدمي الرعاية الصحية للبروتوكول من خلال مراجعة 89 من الملفات الطبية للمرضى لتقييم كيفية تنفيذ بروتوكول علاج الألم ومستوى الامتثال. أما أداة القياس الثالثة فكانت القائمة المرجعية لتقييم البيئة المادية لوحدتي الحروق. أما البيانات النوعية فتم جمعها من خلال 5 مقابلات معمّقة مع مصادر المعلومات الرئيسية لمعرفة المعيقات الكامنة وراء عدم الالتزام ببروتوكول علاج الألم.

نتائج الدراسة

كشفت نتائج الدراسة أن هناك فجوات ومعيقات تواجه علاج آلام الحروق وتطبيق البروتوكول في قطاع غزة. حوالي سبعة وأربعين بالمائة من المشاركين يدركون وجود بروتوكولات وطنية فلسطينية لرعاية ومعالجة الحروق. أيضا مستوى المعرفة حول بروتوكول علاج الألم هو 44.9%، ومستوى الالتزام بتطبيقه هو 12.8%. علاوة على ذلك فإن 80% من المشاركين لم يتلقوا أي دورة تدريبية حول البروتوكول. ثمانية وستون في المائة من المشاركين في الدراسة أجابوا أنه لا توجد متابعة من قبل الإدارة لضمان تنفيذ البروتوكول. علاوة على ذلك فإن هناك نقص حاد في معظم التخصصات المطلوبة في الفريق الطبي متعدد التخصصات، حيث توجد ثلاثة تخصصات فقط في وحدتي الحروق وهي طبيب جراحة التجميل والحروق والتمريض وأخصائي العلاج الطبيعي. أيضا هناك نقص حاد في الإمدادات الطبية والأدوية اللازمة للسيطرة على آلام الحروق. هناك نقص في استخدام الأساليب غير الدوائية في علاج الألم. لا توجد فروق ذات دلالة إحصائية بين المعرفة والبيانات الديموغرافية للمشاركين مثل (العمر، الحالة الاجتماعية، مكان العمل، المؤهل العلمي، وسنوات الخبرة)، بينما توجد فروق ذات دلالة إحصائية بين المعرفة والجنس والمسمى الوظيفي.

الخلاصة

كشفت الدراسة عن مستويات منخفضة من امتثال الفريق الطبي ببروتوكول علاج آلام الحروق. حيث أن هناك حاجة ماسة إلى اعتماد سياسات إدارية وتفعيل دور الرقابة والإشراف وتفعيل نظام التدقيق في كلا المستشفيين لتحسين امتثال مقدمي الرعاية الصحية للبروتوكول. اعداد برامج التعليم والتدريب المستمرة للفريق الصحي فهي خطوة هامة لتعزيز الالتزام. وأخيراً هناك حاجة ملحة لفريق متعدد التخصصات للتعامل مع مرضى الحروق وخاصة أطباء التخدير.