



NEAR EAST UNIVERSITY
INSTITUTE OF GRADUATE STUDIES
DEPARTMENT OF HEALTH SCIENCES

KNOWLEDGE AND PRACTICE OF NURSES
REGARDING WOUND CARE

M.Sc. THESIS

Mohammed Sameer ABU MSALLAM

NICOSIA
January, 2022

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Supervisor
Professor Ümran Dal Yılmaz

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Approval

We certify that we have read the thesis submitted by the thesis committee in Nursing Program (Surgical Nursing) titled “**Knowledge and Practice of Nurses Regarding Wound Care**” and that in our combined opinion it is fully adequate, in scope and in quality, as a thesis for the degree of Master of Educational Sciences.

Examining Committee

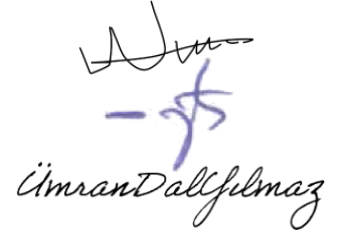
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The image shows three handwritten signatures in blue ink. The first signature is for Professor Nurhan Bayraktar, the second for Professor Zahide Tunçbilek, and the third for Professor Ümran Dal Yılmaz. The third signature is written in a cursive style and includes the name 'Ümran Dal Yılmaz' written below it.

Approved by the Head of the Department

19/01/2022



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Declaration

I hereby declare that all information, documents, analysis and results in this thesis have been collected and presented according to the academic rules and ethical guidelines of Institute of Graduate Studies, Near East University. I also declare that as required by these rules and conduct, I have fully cited and referenced information and data that are not original to this study.

Mohammed Sameer Abu Msallam

19/01/2022

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First and foremost, praise is to ALLAH, the Almighty, the greatest of all, on whom ultimately, we depend for sustenance and guidance. I would like to thank Almighty Allah for giving me the opportunity, determination, and strength to do my research and write my thesis completely. His continuous grace and mercy were with me throughout my life and ever more during the tenure of my research.

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19/01/2022

Hemşirelerin Yara Bakımına İlişkin Bilgi ve Uygulamaları**Öğrencinin Adı:** Mohammed Sameer Abu Msallam**Danışmanı:** Prof. Dr. Ümran Dal Yılmaz**Anabilim Dalı:** Hemşirelik (Cerrahi Hastalıkları Hemşireliği)**ÖZ**

Giriş: Ameliyat sonrası yara takibi ve uygun taburculuk eğitimi, primer bakım sağlayan, yeterli yara iyileşmesi bilgisine sahip hemşireler tarafından hastalara yapılabilir. Hemşirelik becerileri, uygulamaları ve bilgileri zaman zaman sağlık hizmeti düzeyini iyileştirmek için gelişir.

Amaç: Bu çalışmanın amacı hemşirelerin yara bakımı ile ilgili bilgi ve uygulamalarını belirlemektir.

Yöntem: Çalışma, Amman-Ürdün'deki Jabal Al-Zaytoon ve İslam Hastanelerinin ameliyathane, yoğun bakım ünitesi, ortopedi ünitesi, cerrahi ve tıbbi servis ve acil serviste çalışan hemşireler üzerinde gerçekleştirilmiştir. Bu çalışma tanımlayıcı bir çalışma olarak yürütülmüştür, araştırmanın örneklemini araştırmaya gönüllü olarak katılan 260 hemşire oluşturmuştur.. Verilerin toplanmasında Bilgi ve Uygulama ölçeği araçları kullanılmıştır. Bu çalışma hemşirelerin yara bakımı ile ilgili bilgi ve uygulamalarını geliştirmesi açısından önemlidir.

Bulgular: Özel hastanelerde 260 hemşireye anket uygulanmıştır. Yaş Ortalaması ve Standart Sapması (28.06 ± 4.92), Minimum ve Maksimum (21, 48) olarak bulunmuştur. Çalışmaya katılanların %45.8'i erkek (n: 119) ve %54,2'si kadındır (n:141). Hemşirelerin, %81,2'sinin yara iyileşmesine ilişkin uygulamaları doğru, %8,4'ünün yanlış ve %10,4'ünün bazen cevabını işaretledikleri belirlenmiştir. Hemşirelerin yara iyileşmesi konusundaki bilgileri ise, %64,9'u doğru, %19,7'si yanlış ve %15,4'ü cevabı bilmiyor şeklinde saptanmıştır.

Sonuçlar: Yara bakımı bilgi ve uygulamaları arasında bir bilgi boşluğu tespit edildi. Bu nedenle, akut ve toplum temelli uygulamada hemşireler arasında yara bakımındaki mevcut bilgilerini klinik uygulamaya dönüştürmek için çalışmaya ihtiyaç vardır. Amaç, yara bakımı ile ilgili uygulama ve bilimsel kanıtlar arasında bağlantı kurmak olmalıdır.

Anahtar Kelimeler: Hemşire, Bilgi, Beceri, Yara, Hemşirelik bakımı, Yara bakımı, Yara yönetimi.

Knowledge and Practice of Nurses Regarding Wound Care

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Abstract

Introduction: Postoperative wound monitoring and proper discharge education can be carried out by nurses who provide primary care to patients. Nursing skills, practices, and knowledge evolve from time to time to improve the level of health care

Objectives: The aim of this study is to determine the knowledge and practice of nurses regarding wound care.

Methods: The study was performed on the nurses who work at the theatre, ICU, Orthopedic unit, surgical and medical ward, and emergency department of the Jabal Al-Zaytoon and Islamic Hospitals in Amman-Jordan. This study was conducted as a descriptive study, The sample of the study consisted of 260 nurses who voluntarily participated in the study. Knowledge and Practice scale tools was used to collect the data. This study is important to improve Nurses Knowledge and practice regarding wound care.

Results: In this study out of 260 questionnaires were performed by nurses who work in special hospitals, The Mean and Standard Deviation of the age were as (28.06 ± 4.92) , and the Minimum and Maximum were (21, 48). 45.8% (n: 119) were from males and 54.2% (n: 141) from females. The nurses' practices with wound care, 81.2% the average among correct choices, 8.4% choose the wrong answer, and only 10.4% choose sometimes the answer. The nurse's knowledge about wound care, 64.9% the average among correct choices, 19.7% choose the wrong answer, and only 15.4% do not know the answer.

Conclusions: A knowledge gap was identified between wound care knowledge and practice. There is therefore a need to undertake work to translate current trends in wound care into clinical practice among nurses in acute and community-based practice. The aim should be establishing links between the practical and the scientific evidence about wound care.

Keywords: Nurse, Knowledge, Skills, Wound, Nursing care, Wound care, Wound management.

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Abbreviations

Items of Abbreviation	context
AWMA	Australian Wound Management Association
°C	Degrees Celsius
Ca ²⁺	Calcium
cAMP	Cyclic adenosine monophosphate
CDC	Centres for Disease Prevention and Control
CHS	Curative Health Services
DMECs	Dermal microvascular endothelial cells
ECM	Extracellular Matrix
EGF	Epidermal Growth Factor
EPCs	Endothelial Progenitor Cells
HA	Hyaluronic acid
ICU	Intensive Care Unit
MAP	Membrane-Associated Protein
MMP	Matrix Metalloproteinase
NHS	National Health Service
NICE	National Institute for Health and Clinical Excellence
PDGF	Platelet-derived Growth Factor
PKCa	Protein Kinase C a
SMA	Smooth Muscle Actin
SPSS	Statistical Package of Social Sciences
SSI	Surgical Site Infection
TGFβ	Transforming Growth Factor-beta
UV	Ultraviolet
VEGF	Vascular Endothelial Growth Factor
WMNP	Wound Management Nurse Practitioner

CHAPTER I

1.0 Introduction and Aim

1.1 Definition of the Problem

Man has been caring for his wounds since the caveman. Wound treatment progressed from magical incantations, potions, and ointments to Hippocrates and Celsius' methodical treatment on wound care and surgery. Following the fall of the Roman Empire, these accomplishments were lost. In Europe, the Middle Ages saw a return to medicines and charms for wound treatment (George et al., 2006).

An injury to the body's anatomical structure or function is called a wound, and it can be either acute or chronic. Acute wounds are often present in surgical and trauma patients, whereas chronic wounds are often present in unhealthy individuals where the healing process has failed. The presence of a wound represents a considerable burden for health and social care providers in terms of economic cost and impact on patient quality of life (Welsh, 2018). A wound-healing system relies on the awareness of the nurses regarding the biology and wound care methods, and subsequently the nursing strategies. Effective management of chronic wounds is complicated, and it is important that those engaged in their diagnosis and recovery will have the necessary experience and expertise (European Wound Control Association) in order to optimize patient results (Powers et al., 2016). With adequate information about wound care, a nurse may perform a comprehensive and thorough patient assessment and recognize possible complications of the wound at an early stage (Bulut et al., 2012; Magalhães et al., 2012).

Wound care nurses assess and identify the wound and the best treatment options, and implement wound care best practices to prevent future wounds complications. (McCluskey and McCarthy., 2012) recognised the importance of informal sources of knowledge, such as experiential learning and intuition, in shaping competence in wound care practice, the lack of a structured approach and barriers to the implementation of Evidence based Practice were also identified. Primary health care was identified as a high-priority area in need of greater teaching and training around

evidence-based best wound treatment practices, according to a study by the Wound Management Innovation Cooperative Research (Innes-Walker & Edwards, 2013). Coaching methods were also used in the Medical short term care unit model of treatment to give patients comprehensive, evidence-based care and dedicated wound management clinic time through the use of a coaching model of education with a wound care expert a successful coaching position has been employed when it comes to delivering education and clinical skills, as well as encouraging communication and flexibility (Innes-Walker, Parker, Finlayson, et al., 2019). There are several reasons that contribute to wound infection control include insufficient manpower, poor expertise, improper treatment, and unqualified personnel (Famakinwa et al., 2014; Teshager et al., 2015). When compared to other nursing specialties, wound care is a relatively young and emerging field of expertise that presents a unique challenge to nurses in terms of expanding their knowledge base and building the skill in evidence-based wound care. The use of scientific nursing evidence in the treatment, and prevention of wounds, has as the main objective the promotion of patient safety, since this procedure, is used and encourages the implementation of innovative practices. Dressings accounted for 20% of all procedures performed by practice nurses and three of the five most common procedures involved wound management (Britt et al., 2012). To promote a person-centered approach to care by employing facilitation and practice development skills, as well as adult learning techniques (Faithfull-Byrne et al., 2017). Promoting person-centered care in health and social care is extremely important. Working in a person-centred way, you put the individual at the centre of their care and support so they can choose how they want it to be. When practitioners fail to combine knowledge learned in an academic setting with real-world clinical practice, it's known as the theory-practice gap. Patient safety is the goal of knowledge-based practice, which focuses on the individual nurse and the nursing workforce as a whole.

The wound management nurse practitioner (WMNP) model is an important strategy for the management of increased service demands, little is known about the distribution of their parameters of practice or their outcomes (Gibb et al., 2014). An acceptable degree of wound care and wound care expertise not only reduces surgical complications, recurrent admissions, hospitalization time, and expenditures but also improves the quality of life among patients (Hurd, 2013). It is important for nurses to assess and rehabilitate the patient's general health, relieve pressure on the wound

surface, keep it moist and remove necrotic tissue from the wound using appropriate and sterile dressing materials, clean the wound with an antiseptic solution, intervene with infection and cover the wound in sterile gauze bandages. It knows that how nurses are seen by other healthcare professionals, as well as their working circumstances and resources (including education) have a direct influence on the quality of care they provide (Timmins et al., 2018).

1.2 Aim

The Aim of this descriptive study was to determine the knowledge and practice of nurses regarding wound care.

The research questions are as follows:

1. What is the knowledge of nurses regarding wound care?
2. What are the practices of nurses regarding wound care?
3. What is the relationship between Nurses knowledge and practice regarding to wound care?
4. Are there any differences between descriptive characteristics-based on knowledge and practice of nurses regarding wound care?

CHAPTER II

2.0 Literature Review

2.1 Introduction

Client wound care is a multidisciplinary challenge in health care, but it has a considerably bigger impact on nursing practise, which is then carried out fully funded, taking the client into account as a biopsychosocial being and going beyond the technical implementation of the dressing (Adil et al., 2021). Wound care is a dynamic, complex process that necessitates the specific knowledge of the nursing team, which consists of specialists who will create this care in both preventive and specific treatment. It is important to remember that wounds change quickly and are resistant to many methods of therapy, as a result of predisposing circumstances that inhibit natural healing (Barnes et al., 2020). The practise of caring for patients' and clients' wounds is a nursing specialty recognised by the different governing bodies, granting the nurse autonomy to care for skin lesions, as this is a challenge requiring specific knowledge, skills, and holistic approaches (Bornes et al., 2021). In the pursuit of quality treatment, some authors have emphasised the need for nursing workers to have scientific understanding of wounds, as practise is frequently based on myths, traditions, and personal experiences or those of colleagues (Dattola et al., 2020). The use of scientific nursing evidence in the treatment and prevention of wounds has the primary goal of promoting patient safety, because this technique is employed and supports the development of innovative approaches. However, in order for nurses to perform evidence-based medicine, they must have appropriate and up-to-date research evidence about wound treatment and prevention (Gruber et al., 2020). Given the importance of quality of care in wound care, the researcher is interested in conducting this study to assess nurses' knowledge and practice of nurses regarding wound evaluation and treatment, as well as describe their clinical practise in wound care.

Although the causes of intrinsic and environmental ageing differ, certain negative changes, such as increased matrix metalloproteinase (MMP) activity and decreased collagen I expression, are shared (Fang et al., 2016). Most internal organs are affected by this type of ageing, which is similar to intrinsic skin ageing in that it includes the slow decline of tissue function. Dermo-epidermal junctions are distinguished by

epidermis and dermis thinning. With age, dermal cell density and vascularization decrease (Blair et al., 2020; Low, Alimohammadiha et al., 2021).

Fibroblasts become fewer and less biosynthetically capable; tissue elasticity falls, while skin collagen concentration lowers and fibres become randomly packed (Blair, et al., 2020). Skin ageing, according to researchers, is caused by at least three reasons. Cell proliferation is reduced in epidermal keratinocytes, for example (Blair, et al., 2020; Low, et al., 2021; Krutmann et al., 2021). Reduced dermal fibroblasts and melanocytes, as well as an increase in collagen matrix-degrading enzymes such MMPs (Todorova & Mandinova, 2020).

Cellular senescence is the primary cause of diminished cell development. Senescent cells must resist apoptosis while exhibiting altered differential activity to accomplish permanent growth halt. Senescent cells change their gene expression and phenotype as they accumulate, causing tissue function and integrity to deteriorate (Herranz & Gil, 2018; Wang & Dreesen, 2018; Gruber et al., 2020). Collagen is structured in a basket-weave pattern in normal skin (Lee & Woo, 2018). The amount of collagen in the body diminishes with age, and the pace is the same for men and women, about 1% every year until adulthood. Female skin, on the other hand, has a smaller collagen proportion than male skin (Shuster et al., 1975). It is also worth noting that as collagen synthesis declines, collagen fibres become larger and less soluble (Sionkowska et al., 2017; Zhang & Duan, 2018). In adults, the amount of collagen in the skin has a strong correlation with ageing symptoms (Zhang & Duan, 2018).

2.2 Processes involved in wound healing



Figure 1: Process involved in wound healing

I. Platelets are derived from damaged blood arteries and arrive at the site of injury quickly, contributing to haemostasis by sticking and aggregating to form a clot. Platelet-derived Growth Factor (PDGF) and Transforming Growth Factor-beta (TGF) are released (Periyah et al., 2017).

II. Neutrophils are released from blood vessels during the early phases of an inflammatory response in order to eliminate invading bacteria (Rosales, 2020).

III. Some mast cells are already in the tissue, while others enter through blood arteries, where they play an early role in controlling inflammatory response, angiogenesis, and Extracellular Matrix (ECM) reabsorption (Julier et al., 2017).

IV. Some macrophages are already in tissue, most from blood-borne monocytes involve in the Secondary influx from blood after neutrophils have destroyed any immediate microbes in the wound. The role of macrophages is to phagocytose foreign bodies and damaged tissue, release cytokines and proteases (Woodell-May & Sommerfeld, 2020).

V. Keratinocytes from the peri-wound epidermis and appendages (hair follicles, sweat glands) get involved shortly after injury, and horizontal migration begins from the wound edges to repair the epidermal barrier (Peate & Stephens, 2020).

VI. Fibroblasts/Myofibroblasts are derived from the peri-wound dermis, whereas fibrocytes from the circulation participate in the early migration into the wound area to produce granulation tissue. Later in the process, transformation into myofibroblasts occurs, causing wound bed contraction (Lingzhi et al., 2020).

VII. Endothelial Progenitor Cells (EPCs) are blood vessel-derived stem cells that originated in bone marrow. Involved in angiogenesis During hypoxia, endothelial cells migrate and multiply to produce new blood vessels at the wound site (Naito et al., 2020).

VIII. Dendritic cells, epidermally-derived Langerhans cells, and dermally-derived dendritic cells are engaged in re-epithelialization and immune response in the first two days after wounding (Keyes et al., 2016).

2.2.1 Haemostasis

Haemostasis is a vital protective mechanism that relies on a delicate balance of procoagulant and anticoagulant activities. The delicate interaction of four essential components — vascular endothelium, platelets, the coagulation pathway, and fibrinolysis controls the rapid transition of blood from its fluid condition to a localized thrombus at the site of tissue injury (Podoplelova et al., 2016; Austin, 2017). In vitro, platelet-derived growth factor (PDGF) regulates chemotactic fibroblasts and smooth muscle cells (Kardas et al., 2020). Clot-inducing factors keep blood from clotting. The production of Prostacyclin (which inhibits platelet aggregation), the binding of antithrombin III to thrombin (which inhibits its activity), the production of protein C (an enzyme that degrades coagulation factors V and VIII), and the release of plasminogen activator (which initiates clot lysis) are all intravascular factors that inhibit clotting (V). To halt bleeding, thrombin catalyzes the conversion of fibrinogen to fibrin near the ends of injured blood vessels, and fibrin forms cross-links with platelets (Venkatesha et al., 2016; Austin, 2017; Iba et al., 2019).

When monocytes and fibroblasts are brought to the site of damage, haemostasis offers a matrix framework for them. In the presence of platelets, fibrin strands create a web that catches red blood cells, resulting in an impenetrable clot (Tizard, 2017). Not only does the clot stop additional bleeding and infection, but it also closes the wound (Opneja et al., 2019). The activation of the Hageman factor, which results in

the production of its fragments, bradykinin, and vasoactive substances, as well as the stimulation of classical and alternative complement cascades, is part of the inflammatory response in wound care (Napolitano & Montuori, 2021). Anaphylatoxins C3 and C5 are then released, increasing blood vessel permeability and attracting neutrophils and monocytes to the wounded tissue (Quell, 2019).

2.2.2 Inflammatory Response

Infection defense in the host may be divided into two types: innate immune response and acquired immunological response. Innate immunity is achieved by the expression of recognition proteins in germ line cells, whereas acquired immunity is achieved through antigen exposure during the organism's life, either through infection (active immunity) or through the transfer of an antibody (passive immunity) (Marshall, Warrington, Watson, et al., 2018). The majority of the cells involved in the healing process include neutrophils, macrophages, mast cells, dendritic cells, eosinophils, and basophils (Conceição-Silva et al., 2021). T- and B-cells have been demonstrated to play a role in wound care. Wound care is delayed in the absence of dendritic cell-derived T cells (Li et al., 2018), and epidermally-derived T cells release growth factors in the skin during wound care (Keyes et al., 2016), leading the skin to thicken. Neutrophils enter in large numbers in the wound within minutes of injury, lured by a variety of chemotactic signals, and destroy undesirable particles such as bacteria (Singh et al, 2017). Phagolysosomes, which generate enzymes and reactive oxygen species, destroy bacteria (Hoffmann & Griffiths, 2018).

Chemotactic factors boost neutrophil adherence to blood artery endothelium and leukocyte migration across the endothelium in addition to raising CD11 and CD18 expression on neutrophil surfaces. Cytokines released in sick or wounded tissues provide messages to leukocytes in surrounding blood vessels. Endothelial surface proteins, particularly selectins, which are expressed on the inner wall of the blood artery, trigger leukocyte adhesion. Leukocytes "roll" along the blood artery's wall until they find a way out, either via two endothelial cells or through the blood vessel itself (paracellular or transcellular extravasation with one) (Alon & van Buul, 2017; Németh, Sperandio & Mócsai, 2020).

2.2.3 Cutaneous wound repair

Wound repair is a fairly intricate set of events at its most basic, and the intrinsic skin repair response consists of a number of overlapping steps. Haemostasis takes place within minutes of injury, clotting broken arteries and limiting blood loss while building a temporary skin barrier. An inflammatory response is induced within minutes or hours. Neutrophils are the first to be drawn in, followed by monocytes and macrophages. Fibroblasts proliferate in the dermis while keratinocytes multiply in the epidermis during the proliferative phase, allowing for re-epithelialization and angiogenesis. This happens when the wound's myofibroblasts start to contract, forcing the wound borders to close in on each other. In humans, matrix growth and remodelling can take up to a year following mature scar injury (Rousselle et al., 2019; Guillamat-Prats, 2021). However, under normal circumstances, the phases are not mutually exclusive and overlap in time (Rodrigues & Gurtner, 2017; Cheng & Eriksson, 2017; Rodrigues et al., 2019; Yang et al., 2021).

Several cell types arise throughout the healing process, including those from the epidermis, dermis, hair follicles, and blood vessels, to name a few. Describes the location, timing, and types of cells involved in repair. The initial stages of healing occur between hours and days after the wound has healed. The final stages of healing occur several days to weeks after the wound has healed.

2.3 Granulation tissue formation and the proliferative phase

Four days after the original injury, granulation tissue begins to grow gradually (Jimi et al., 2017). When the tissue is cut and visually studied, it has a granular appearance. Granulation tissue contains macrophages, as well as loose connective tissue and blood vessels, as well as growth factors such as TGF (Ellis et al., 2018). TGF-1 is one of the most essential growth factors produced into the wound site by plasma-activated platelets with low cytokine levels. TGF-1 creates a positive feedback loop by stimulating its own gene transcription while also recruiting additional inflammatory cells (Vinish et al., 2016; Mihai et al., 2019). Aside from healing the wound, the fibrin clot promotes granulation tissue formation by acting as a scaffold for the contact guiding of fibroblasts and inflammatory cells, as well as a reservoir for TGF and TNF-cytokines. In order to promote angiogenesis and fibrous tissue

formation, macrophages in the wound provide a steady flow of cytokines (Chen et al., 2021).

In the proliferative tissue phase, two types of cells are involved: TGF and PDGF govern the migration of fibroblasts into the wound, using fibrin and fibronectin as scaffolding (Wang et al., 2019; Clark et al., 2020). Cell motility is aided by the expression of $\alpha 1$ integrin in response to Epidermal Growth Factor (EGF) and TGF (Chen et al., 2016). FGF-induced fibroblast proliferation also results in the formation of fibronectin, which eventually replaces the fibrin clot (Xie et al., 2020). TGF, PDGF, and FGF regulate a process in which wound fibroblasts store collagen in the granulation tissue, eventually replacing fibronectin (Singh et al., 2017). The extracellular matrix (ECM) is deposited preferentially around the wound border when the granulation tissue is growing, but it is deposited more centrally as the granulation tissue extends into the wound space (Clark, et al., 2020). This develops as a result of the formation of granulation tissue during the proliferative phase.

2.4 Re-epithelialization

For a wound to heal, keratinocytes must grow and migrate (Bornes et al., 2021). The free edge effect begins re-epithelialization 18 hours following wounding by signalling cell-to-cell interaction that demonstrates the absence of neighbouring cells at the wound edge. Dermal keratinocytes at the wound's border experience morphological changes, including flattening and changes to their intracellular desmosomes, which link epithelial cells (Stone et al., 2016). They are cellular junctions that unite cells and provide tensile strength to the tissue. Desmosomes can occur in both calcium (Ca^{2+}) dependent and Ca^{2+} independent forms. Desmosomes revert to a Ca^{2+} dependent condition when cells migrate and multiply, as they do during growth, development, and wound care. This transition is considered to be regulated by Protein Kinase C (PKC) in normal tissue (Quaresma et al., 2017).

Cells can transfer from the epidermis to the basement membrane due to a shift in hemidesmosomes. Keratinocytes are stimulated by EGF, KGF, and TGF-1 and TGF-2, whereas MMPs produced by wounded keratinocytes near the wound edge break collagen in the basal lamina, allowing cell migration (Stoica et al., 2020). MMP1 expression ceases when the epidermis is repaired (Cole et al., 2018). Keratinocytes from the wound's basolateral side and increased actinomyosin filament create

pseudopodia. Epidermal cells near the wound's edge have lateral mobility and migration capacities in response to morphological changes. (Clark, et al., 2020). Before epidermal migration, base fibronectin is administered to the wound to allow keratinocyte migration and adhesion (Jara al., 2020). Keratinocytes from the stratified epidermal sheet or hair follicle begin to migrate when the stratified epidermal sheet or hair follicle stratifies. Front cells are eventually overwhelmed by cells from behind and replaced. These cells must expand above the adhering basal layer (fibronectin) and join at the wound to become leading cells (Nicholas et al., 2016).

The synthesis of keratinocyte intermediate filaments may be used to assess the subtypes and maturation of keratinocytes involved in wound care and their maturation. Basal keratinocytes and wound edge cells express keratins K5 and K14 based on their location in the epidermis' suprabasal area, whereas suprabasal cells express keratins K5 and K14 with lower expression of K15. Certain keratinocytes near the wound edge express K10, whereas others in the wound core express K6, K16, and K17 instead, according to studies (Haensel, 2019).

2.5 Angiogenesis

Angiogenesis is the formation of new blood vessels in tissue, either during development or in response to injury or tumour-related angiogenic. There are numerous distinctions between microvascular cells and the endothelial cells that line our circulatory system's larger arteries. During normal growth, dermal microvascular endothelial cells (DMECs) have an epithelioid form. As a result, cells at the wound's edge, both in vitro and in vivo, take on the appearance of myofibroblasts (Veith et al., 2019). Angiogenesis involves a number of physiological and pathological processes, including Physical angiogenesis begins in the womb and continues into adulthood. When a tumour forms, a myocardial infarction happens, a wound heals, or an infection arises, pathological angiogenesis begins, and the new vasculature created are exceedingly aberrant, irregularly structured, and branching (Aguilar-Cazares et al., 2019).

Within a few days of damage, angiogenic capillary sprouts infiltrate the wound clot and granulation tissue. As collagen accumulates in the wound area, the density of capillaries in the granulation tissue decreases. Endothelial cell ECM receptors and angiogenic cytokines, such as vascular endothelial growth factor (VEGF), TGF-, and

FGF, are required for morphogenetic alterations in blood arteries during healing (Nakamichi et al., 2016).

The wound edges move centripetally as a result of wound contraction, reducing the wound size. 3-4 days after the injury, injured skin fibroblasts multiply and expand, moving into the wound's temporary matrix (Yannas et al., 2017). There is a lag between the time of damage and fibroblast migration, which is thought to be induced by dormant activity (Theoret, 2016). TGF-1 and PDGF have been demonstrated to behave as mitogens and chemotactic agents for wound edge fibroblasts, respectively. According to study, this chemical has the greatest effect on late-stage fibroblasts, which are present 21-28 days after damage (Mateu Sanz, 2021).

Myofibroblasts are newly invaded fibroblasts with large bundles of microfilaments containing F-actin along the plasma membrane and at cell-cell and cell-matrix linkages (Darby et al., 2016), as well as the ability to express smooth muscle actin (SMA) during the intermediate stages of healing, 7-14 days post-wounding. A protomyofibroblast serves as an intermediate during the transformation from fibroblast to myofibroblast. The protomyofibroblast contains stress fibres with α -SMA and β -tubulin cytoplasmic activity. The protomyofibroblast is more likely to grow into a myofibroblast containing SMA fibres (Hinz, 2016; Darby et al., 2016; Tai et al., 2021). As soon as the incision is sufficiently closed, a series of signalling steps occur: first, fibroblasts activate the adenosine 3'5' monophosphate (cAMP) pathway, which desensitizes PDGF and EGF receptors on the Apoptosis occurs as a result of the cells returning to a quiescent state. Because of the wound stress, the expression of contraction-associated genes like SMA developed sooner than in normal wounds (Lorden et al., 2016).

2.6 Tissue remodelling and maturation in wound healing

The fibrin clot is supplanted by a collagenous scar during tissue remodelling. Fibronectin and proteoglycans are added to the fibrin and collagen provisional matrix, which can take up to a year to complete. The incision is unlikely to get infectious once it has been closed, but the scar will still be cellular and highly vascularized, as well as pigmented. The clot will lift off once invading granulation tissue is lysed by MMPs and tPA at its leading edge (Patil, 2016; Tracy et al., 2016; Potekaev et al., 2021).

Hyaluronic acid (HA) is one of the most important components of early wound healing granulation tissue, although the amount of HA drops after the fifth post-wounding day. However, after the 10th post-wounding day (Pereira et al., 2018), the number of extracellular matrix proteoglycans, generated by mature scar fibroblasts, rises as (HA) levels drop in the second-week post-wounding. Versican, a proteoglycan component that stimulates cell motility by reducing cell adhesion, is a component of proteoglycans that contributes to tissue resilience in the wound scar. The quantity of collagen deposition is altered if (HA) levels stay high during the remodelling period (Gao et al., 2019).

The skin barrier must be rebuilt during the healing phase to avoid blood loss and infection from invading foreign bodies. The depth and surface area of the wound, as well as a slew of related morbidities, all have an influence on the rate and quality of wound healing. It's critical to note that age plays a role, and that acute wound healing is significantly delayed in the elderly (Fayne et al., 2020).

Wounds that take a long time to heal may become infected and non-healing. A variety of medical conditions, such as venous insufficiency and diabetes mellitus, also contribute to the formation of chronic ulcers that do not heal. The treatment of such wounds is estimated to have cost the world's health systems between \$28.1 billion and \$96.8 billion. Economically, the annual wound care products industry is expected to reach \$15–22 billion by 2024. (Nussbaum et al., 2018; Sen, 2019, 2021).

2.7 Prevalent Chronic Lesions

2.7.1 Diabetic Ulcers

Type I and II diabetics have a 25% lifetime chance of having non-healing foot ulcers (MacDonald et al., 2019), and lower leg amputation is eight times more likely in diabetics over 45 than in non-diabetics (Musa et al., 2018). Diabetes-related neuropathy and vasculopathy are two of the most frequent foot issues. Motor neuropathy causes abnormal foot shape and weight-bearing, putting the foot at risk of injury. Peripheral neuropathy affects at least 28% of diabetics (Sadriwala et al., 2018). Consequently, diabetic ulcers are more frequent in those who have neuropathy and are

unable to sense or alleviate cutaneous pressure. Arteriosclerosis is more common and severe in diabetics than in non-diabetics (Barnes et al., 2020). Wound ischemia develops as a result of microvascular blockage and insufficient oxygen and nutrient delivery, resulting in tissue destruction (Dewi & Hinchliffe, 2020). Diabetic wounds have a higher risk of infection and a longer healing period due to reduced macrophage and neutrophil activity (Hicks et al., 2018). There is a clear correlation between the wound's size, duration, and grade, as seen in the figure below (Butt et al., 2013).

Grade	Appearance
0	Normal healing
I	Normal healing with mild bruising or erythema
	A—some bruising
	B—considerable bruising
II	Erythema plus other signs of inflammation
	A—at one point
	B—around sutures
	C—along wound
III	Clear or haemoserous discharge
	D—around wound
	A—at one point only (<2 cm)
	B—along wound (>2 cm)
IV	Pus/purulent discharge
	C—large volume
	D—prolonged (>3 days)
V	Deep or severe wound infection with or without tissue breakdown;
	A—at one point only (<2 cm)
	B—along wound (>2 cm)

Figure 2: The Southampton Wound Scoring System

2.7.2 Venous Ulcers

Venous leg ulceration is caused by venous hypertension, which can be caused by valve failure with reflux or venous thrombosis with outflow obstruction (or any combination of the two). The mechanism by which hypertension causes ulcers is unknown, though several theories have been proposed, including the peri capillary

fibrin cuff theory, a decreased pressure gradient leading to a decrease in capillary bed perfusion pressure and capillary flux, and the growth factor trap hypothesis (Marola et al., 2016; Millan et al., 2019). According to the study, endothelial cell failure is induced by leukocyte activation and the formation of proteases and oxygen free radicals, whereas capillary constriction causes hypoxia, which leads to bacterial infection and subsequently delayed recovery (Raffetto et al., 2021). In addition, fibroblast cells isolated from the margins of venous ulcers have a decreased capacity to synthesize collagen in vitro (Crawford et al., 2017).

2.7.3 Pressure Sores

Patients with lengthy immobility, such as the elderly, disabled, and elderly, as well as new-borns and tiny children, are more vulnerable to pressure sores. Pressure on the skin, underlying bones, skin moisture, rising age, and co-morbidities are the main factors that lead to the development of a pressure ulcer (Iqbal et al., 2017; Andersen, 2019). The majority of pressure ulcers affect the lower body, particularly the pelvis (Grey et al., 2006). Every year, over 700,000 people in the United Kingdom suffer from pressure ulcers, with 180,000 of them forming for the first time. Pressure ulcers cost the National Health Service (NHS) more than 3.8 million pounds a day (Wood et al., 2019).

2.8 Nurses Knowledge and practice as regards wound care

Wound treatment is largely handled by district nurses and other community health and social care workers in the UK due to the increasing decentralization of health and social care (Heaslip, 2013; Guest et al., 2020). As a result, increasingly overworked district nurses are under strain (Bird, 2016). As a consequence of scientific evidence, dry wound healing has given way to moist wound healing (Leaper et al., 2012; Nuutila & Eriksson, 2021). When it comes to clinical practice, wet interactive wound healing is not often used. The transition to moist healing and the awareness that traditional wound therapies (such as gauze) offer little to actively support healing have affected today's wound care strategy. The type of dressing used must be chosen by an objective wound examination, whether the wound is closed with sutures for primary healing or left open for secondary healing (Singh et al., 2017).

Although there is no empirical data to support their use in preventing surgical site infection, antimicrobial dressings such as honey, silver, and iodine are becoming more popular surgical wound infection. Its key roles include the capacity to precisely assess the wound during surgery, absorb exudates, minimize pain, and protect newly formed tissue (Sarheed et al., 2016). Because they allow for moisture and gas exchange, today's dressings are intended to keep the skin around them wet without macerating it (Dabiri et al., 2016). The sophistication and range of materials available may make selecting a wound dressing difficult. According to one study, having a large number of dressings is advantageous in wound therapy because it gives healthcare personnel more alternatives and allows them to choose the dressing based on each patient's individual clinical needs (Gillespie, et al., 2012; Hussey et al., 2019). Doctors must be knowledgeable with a wide range of products in order to make an informed decision on which dressing is best.

The two most prevalent dressing processes taught to nursing students are the wound field concept and aseptic techniques (clean approach) (Wistrand et al., 2018). When utilizing the aseptic method, no contact is made with the wound, which is supposed to improve healing and reduce the chance of infection. Using the aseptic procedure, hands, surfaces, and equipment should be maintained as germ-free as feasible. As a result, the aseptic method was regarded the gold standard approach. However, it is unclear if the aseptic or clean method influences surgical wound infection rates. The wound field idea has been proposed as an alternative to the aseptic technique for wound dressings in acute care and community settings. The recognition that wounds are discrete micro-environments that are not sterile once exposed is a critical component of the wound field concept. As a consequence, contaminants from the patients and their wounds will not infect the wound. There will be no more infection unless foreign materials are introduced into the wound site. According to certain experts, the clothing strategy has always been based on ritualistic behaviours rather than concepts (Coleman et al., 2017; Gray et al., 2018; Choi, 2019; Hawker, 2019; Tambe et al., 2019).

During the postoperative period, the removal of a dressing is frequently a subject of contention. Is it essential to cover an incision with a covering after 48 hours? Is taking a shower or bath damaging to the healing process? Early wound exposure may

increase the risk of contamination and surgical wound infection; however, other evidence shows that prolonged dressing durations are not advantageous. According to current clinical practice standards, postoperative surgical bandages should be retained in place for up to 48 hours following surgery (Vowden and Vowden, 2017; Timmins et al., 2018; Blackburn et al., 2019).

In the United States, Europe, and Australia, clinical recommendations, standards, and position statements on acute wound treatment have been produced. Centre for Disease Prevention and Control (CDC) publishes guidelines for decreasing surgical wound infection in the United States. It is built on a combination of scientific facts, a theoretical rationale, and a context (APWCA, 2012; Leaper et al., 2012; Leaper & Edmiston, 2017; Solomkin et al., 2017). This includes hand washing, antimicrobial prophylaxis, postoperative wound care, and infection surveillance. While the National Institute for Health and Clinical Excellence (NICE) (2020) in the United Kingdom uses similar criteria, it also relies on data from clinical studies when making recommendations. As a result of the aforementioned principles, the Australian Wound Management Association (AWMA) has established standards for the treatment of both acute and chronic wounds (AWMA, 2016). A multidisciplinary approach to wound care, as well as wound care education and research are explicitly addressed in these guidelines. Well-rounded wound care demands a solid knowledge basis, no doubt.

In certain areas, wound treatment in the acute phase following surgery is still a source of debate and ambiguity. The growth of dressings that interact with the wound environment rather than merely covering the lesion is a specific effect of improvements in wound care approaches (Weller & Team, 2019). Wound management has evolved significantly over time, and this has had an impact on the practice of acute care nurses. Nurses must be skilled in order to provide good surgical care to patients in the early postoperative period. To get insight into the nurses' clinical practices when it comes to wound therapy, we must first define their current knowledge level (Gillespie et al., 2013; Welsh, 2018; Probst et al., 2019).

CHAPTER III

3.0 Materials and methods

3.1 Study Design

The study was designed as a descriptive study.

3.2 Study Setting

The study was conducted at the Jabal Al-Zaytoon private Hospital and Islamic private hospital in Amman-Jordan. Jabal Al-Zaytoon hospital have 200 beds and Islamic hospital have 270 beds. These hospitals serve as the main referral hospitals in Amman-Jordan.

Jabal Al-Zaytoon private Hospital and Islamic private hospital located in Amman Governorate-Jordan. Jabal Al-Zaytoon private Hospital, opened on 25 May 2001 that composed of the surgical, medical, gynaecologic, ophthalmic, dermatologic, radiologic, laboratory, and Emergency department. Daily patient rates above 300 patients.

Islamic Private Hospital located in Amman Governorate-Jordan opened at 1982 that composed of the surgical, medical, orthopaedic, ophthalmic, dermatologic, radiologic, laboratory, and Emergency department. Daily patient rates above 400 patients.

3.3 Sample Selection

The study was performed on the nurses who work at the theatre, ICU, Orthopaedic unit, surgical and medical ward, and emergency department of the Jabal Al-Zaytoon and Islamic Hospitals in Amman-Jordan. Number of nurses staff working at Jabal Al-Zaytoon hospital; Surgical and Medical department 40 Nurses, Emergency department 30 nurses, ICU department 22 Nurses, Operation department 40 Nurses in deferent level like BSN, Diploma, working by two shift Morning and Evening. Number of nurses working at Islamic Private Hospital; 25 nurses in emergency department, Surgical and Medical department 44Nurses, ICU department 37, Operation department

40 Nurses in deferent level like BSN, DEPLOM, working by two shifts: Morning and Evening.

The total number of nurses who are working in ICU, surgical and pediatric departments at Jabal Al-Zaytoon and Islamic hospital were 278 nurses, 260 volunteer nurses formed the sample of the study according to inclusion criteria; Jordanian nurses who have served for at least one year in any acute care hospital (full time) since receiving their certification from Jordanian Nursing and Midwifery Council, hold a minimum of a bachelor degree in nursing, and can read English were eligible to participate. Excluding criteria; trainees nurses, nurses who can't speak English and nurses who hold less than BSN.

3.4 Study Tools

The data were collected by using a questionnaire formed by the researcher based on literature (Gabrielle Begido 2016), (Yeliz Sürme 2016). The questionnaire consists of three sections. (Appendix I)

1- The first section developed by the researcher regarding the demographic characteristics of nurses constitute 5 questions such as (Gender, Age, Marital Status, Working experience, and Ward).

2-The second section includes 12 Questions on' knowledge of wound care with three choices (Yes, No, I don't know).

3-The third section also include 12 Questions on practices of wound care with three choices (Yes, No, Sometimes).

3.5 Data collection

Data were collected using a questionnaire between 1 to 20 Aug.2020. The questionnaires were administered on nurses while they are on the wards or clinics during duty shift with face to face, self-completion method. Completion of the questionnaire took almost 15 minutes.

3.6 Ethical Aspect

Ethical approval was obtained from the Near East Institutional Reviews Board (IRB) Monday, June 15, 2020 (Appendix II) of Near East University in addition; Organizational permission was obtained from the Jabal Al-Zaytoon Hospital and Islamic private Hospital located in Amman Governorate-Jordan (Appendix 3). In addition, informed consent from the nurses was obtained.

3.7 Analysing Method

Statistical Package of Social Sciences (SPSS) software version 21.0 was used to analyse the collected data. The methods used to analyse the data include an analysis of descriptive statistic variables such as frequency and percentages for the categorical variables. The Pearson Chi-Square test was done to determine the differences. When statistic was significant, the chosen level of significance is $p < 0.05$.

CHAPTER IV

4.0 Findings and Discussion

4.1 Samples Distribution

Table 1. The descriptive characteristics of nurse's participants (n= 260)

Gender	n	(%)
Male	119	45.8
Female	141	54.2
Departments		
ICU	70	26.9
Pediatric	83	31.9
Surgical	107	41.2
Working Experiences		
0-1 year	32	12.3
1-2 years	30	11.5
2-3 years	70	26.9
More than 3 years	128	49.2

In this study out of 260 questionnaires were performed by nurses who work in special hospitals, The Mean and Standard Deviation of the age was (28.06 ± 4.92), and the Minimum and Maximum were (21, 48). 45.8% (n: 119) of the study sample consisted of males and 54.2% (n: 141) from females as shown in Table 2. The distribution of nurse's participants among different hospital departments were from 26.9% ICU, 31.0% Paediatric, and 41.2% Surgical department. The distribution of nurse's participants working experience were categorized into four groups, the Mean and Standard Deviation of working experience were (3.13 ± 1.04). The majority were 2-3 years and more than 3 years groups.

Table 2: Results of Knowledge about Wound care

Questions	Yes		No		I do not know		p-value
	n	%	n	%	n	%	
Q1: Does Povidone indicated to clean chronic wounds? (No)	207	79.6	50	19.2	3	1.2	0.014
Q2: Roofing moist gauze drought are most suitable for the treatment of chronic wounds clean and granulation tissue? (Yes)	124	47.7	35	13.5	101	38.8	0.001
Q3: In chronic wounds, the good bacteria are these ones that are dead? (NO)	124	47.7	33	12.7	103	38.5	0.001
Q4: The wound-assessment is a cumulative process that includes observation, data collection and evaluation? (yes)	191	73.5	14	5.4	55	21.2	0.001
Q5: Moist wound therapy is the gold standard for chronic wound management? (yes)	170	65.4	14	5.4	76	29.2	0.001
Q6: Classic signs of infection may not be present in patients with chronic wounds or in those who are immunosuppressed? (yes)	176	67.7	39	15.0	45	17.3	0.001
Q7: Topical enzymes are effective for removing necrotic tissue in chronic wounds? (yes)	194	74.6	14	5.4	52	20.0	0.001
Q8: Increase pain and wound discharge indicate surgical site infection? (yes)	248	95.4	12	4.6	0	0.0	0.194
Q9: The size and site of the wound affect the period of wound healing? (yes)	257	98.8	3	1.2	0	0.0	0.372
Q10: Prolong hospitalization delay the healing process? (yes)	165	63.5	76	29.2	19	7.3	0.002
Q11: Wound pain should be rated by the clinician, not the patient? (NO)	52	20.0	183	70.4	25	9.6	0.001
Q12: I received sufficient education on chronic wounds in my basic nursing education program? (Yes)	232	89.2	23	8.8	5	1.9	0.023

4.2 Results of Knowledge about Wound care

The p-value was analysed by using Chi-Square Tests for the answers to find if there any significant difference between correct and wrong answers for the participant. Regarding to the analysis findings question 1, 2 and 3 have the lowest percentage of the correct answers.

Question 1 shows the knowledge about wound care of what if povidone is indicated to clean chronic wounds? Regarding the correct answer which is (NO) 19.2% (n=50) were p-value 0.014 matched with the correct answer which mean that there is a significant difference.

Question 2 shows the knowledge about wound care of what if Roofing moist gauze drought are most suitable for the treatment of chronic wounds clean and granulation tissue? Regarding the correct answer which is (yes) 47.7% n=124 were matched with the correct answer, 13.5% n=35 answered wrong, and 38.8% n=101 were not knowing the answer; P-value is 0.001 with high significant differences.

Question 3 shows the knowledge about wound care of what if in chronic wounds, the good bacteria are these ones that are dead? Regarding the correct answer which is (NO) 12.7% n=33 were matched with the correct answer, 47.7% n=124 answered wrong, and 38.5% n=103 were not knowing the answer P-value is 0.001 with high significant differences.

Question 4 shows the knowledge about wound care of what if the wound assessment is a cumulative process that includes observation, data collection, and evaluation? Regarding the correct answer which is (yes) 73.5% n=191 were matched with the correct answer, 5.4% n=14 answered wrong, and 21.2% n=55 were not knowing the answer P-value is 0.001 with high significant differences.

Question 5 shows the knowledge about wound care of what if Moist wound therapy is the gold standard for chronic wound management? Regarding the correct answer which is (yes) 65.4% n=170 were matched with the correct answer, 5.4% n=14 answered wrong, and 29.2% n=76 were not knowing the answer P-value is 0.001 with high significant differences.

Question 6 shows the knowledge about wound care of what if Classic signs of infection may not be present in patients with chronic wounds or in those who are immunosuppressed? Regarding the correct answer which is (yes) 67.7% n=176 were matched with the correct answer, 15.0% n=39 answered wrong, and 17.3% n=45 were not knowing the answer P-value is 0.001 with high significant differences.

Question 7 shows the knowledge about wound care of what if topical enzymes are effective for removing necrotic tissue in chronic wounds? Regarding the correct answer which is (yes) 74.6% n=194 were matched with the correct answer, 5.4% n=14 answered wrong, and 20.0% n=52 were not knowing the answer P-value is 0.001 with high significant differences.

Question 8 shows the knowledge about wound care of what if Increase pain and wound discharge indicate surgical site infection? Regarding the correct answer which is (yes) 95.4% n=248 were matched with the correct answer, and 4.6% n=12 answered wrong. The answers have No significant differences, because of P-value = 0.194 which is ($P > 0.05$).

Question 9 shows the knowledge about wound care of what if the size and site of the wound affect the period of wound healing? Regarding the correct answer which is (yes) 98.8% n=257 were matched with the correct answer, and 1.2% n=3 answered wrong. The answers have No significant differences, because of P-value = 0.372 which is ($P > 0.05$).

Question 10 shows the knowledge about wound care of what if prolong hospitalization delay the healing process? Regarding the correct answer which is (yes) 63.5% n=165 were matched with the correct answer, 29.2% n=76 answered wrong, and 7.3% n=19 were not knowing the answers, P-value 0.002 have A significant differences.

Question 11 shows the knowledge about wound care of what if Wound pain should be rated by the clinician, not the patient? Regarding the correct answer which is (NO) 70.4% n=183 were matched with the correct answer, 20.0% n=52 answered wrong, and 9.6% n=25 were not knowing. The answers P-value is 0.001 with high significant differences.

Question 12 shows the knowledge about wound care of what if I received sufficient education on chronic wounds in my basic nursing education program? Regarding the correct answer which is (Yes) 89.2% n=232 were matched with the correct answer, 8.8% n=23 answered wrong, and 1.9% n=5 were not knowing. The answers P-value is 0.023 have significant difference.

The Average of Answers about Knowledge:

Correct Answer	Wrong Answer	I Don't Know
64.9%	19.7%	15.4%

Table 3: Results of Practices Regarding Wound Care

Questions	Yes		No		Sometimes		p-value
	n	%	n	%	n	%	
Q1: In Wound care, are gloves used to exchange sterile dressings for chronic wounds? (yes)	243	93.5	14	5.4	3	1.2	0.009
Q2: The skin assessment part of the daily evaluation for all patients? (Yes)	145	47.7	107	41.2	8	3.1	0.001
Q3: I perform aseptic technique while wound dressing? (Yes)	251	96.5	6	2.3	3	1.2	0.142
Q4: At your place of professional presence for standards (protocols, manual, etc.) about the care of patients with wounds? (yes)	219	84.2	19	7.3	22	8.5	0.001
Q5: I advise my patient to shower with anti-microbial agent preoperatively? (yes)	101	38.8	78	30.0	81	31.2	0.004
Q6: I use sterilized solution for cleaning the wound? (yes)	256	98.5	0	0.0	4	1.5	0.242
Q7: My facility has a policy for how often a wound assessment should be completed and documented? (yes)	236	90.8	3	1.2	21	8.1	0.001
Q8: I check and assess the wound site condition? (yes)	255	98.1	0	0.0	5	1.9	0.154
Q9: Pressure redistribution products (such as beds, special mattresses, upholstered chairs) are used in your workplace to prevent PUs? (yes)	235	90.4	3	1.2	22	8.5	0.487
Q10: I feel confident to make recommendations to my team about the covers for wounds? (yes)	182	70.0	12	4.6	66	25.4	0.001
Q11: I'm comfortable in making recommendations to practitioners on appropriate wound dressings for my patients? (Yes)	179	68.8	15	5.8	66	25.4	0.001
Q12: Nurses in my facility wear sterile gloves for dressing changes on chronic wounds? (Yes)	234	90.0	3	1.2	23	8.8	0.001

4.3 Results of Practices Regarding Wound Care

The p-value was analysed by using Chi-Square Tests for the answers to find if there any significant difference between correct and wrong answers for the participant. Regarding to the analysis findings question 2, 5 and 11 have the lowest percentage of the correct answers.

Question 1 shows the practices regarding wound care of what if in wound care, are gloves used to exchange sterile dressings for chronic wounds? Regarding the correct answer which is (Yes) 93.5% n=243 were matched with the correct answer, 5.4% n=14 answered wrong, and 1.2% n=3 the answer were sometimes. P-value is 0.009 which mean that the answers have a significant difference.

Question 2 shows the practices regarding wound care of what if the skin assessment part of the daily evaluation of all your patient? Regarding the correct answer which is (Yes) 55.8% n=145 were matched with the correct answer, 41.2% n=107 answered wrong, and 3.1% n=8 the answer were sometimes. P-value is 0.001 which mean that the answers have a high significant difference.

Question 3 shows the practices regarding wound care of what if I perform aseptic technique while wound dressing? Regarding the correct answer which is (Yes) 96.5% n=251 were matched with the correct answer, 2.3% n=6 answered wrong, and 1.2% n=3 the answer were sometimes. The answers have no significant differences because of P-value = 0.142 which is ($P > 0.05$).

Question 4 shows the practices regarding wound care of what if at your place of professional presence for standards (protocols, manual, etc.) about the care of patients with wounds? Regarding the correct answer which is (Yes) 84.2% n=219 were matched with the correct answer, 7.3% n=19 answered wrong, and 8.5% n=22 the answer were sometimes. P-value is 0.001 which mean that the answers have a high significant difference.

Question 5 shows the practices regarding wound care of what if I advise my patient to shower with anti-microbial agent preoperatively? Regarding the correct answer which is (Yes) 38.8% n=101 were matched with the correct answer, 30.0% n=78

answered wrong, and 31.2% n=81 the answer were sometimes. P-value is 0.004 which mean that the answers have a significant difference.

Question 6 shows the practices regarding wound care of what if I use sterilized solution for cleaning the wound? Regarding the correct answer which is (Yes) 98.5% n=256 were matched with the correct answer, and 1.5% n=4 the answer were sometimes. The answers have no significant differences because of P-value = 0.242 which is ($P > 0.05$).

Question 7 shows the practices regarding wound care of what if my facility has a policy for how often a wound assessment should be completed and documented? Regarding the correct answer which is (Yes) 90.8% n=236 were matched with the correct answer, 1.2% n=3 answered wrong, and 8.1% n=21 the answer were sometimes. P-value is 0.001 which mean that the answers have a high significant difference.

Question 8 shows the practices regarding wound care of what if I check and assess the wound site condition? Regarding the correct answer which is (Yes) 98.1% n=255 were matched with the correct answer, and 1.9% n=5 the answer were sometimes. The answers have no significant differences because of P-value = 0.154 which is ($P > 0.05$).

Question 9 shows the practices regarding wound care of what if Pressure redistribution products (such as beds, special mattresses, upholstered chairs) are used in your workplace to prevent PUs? Regarding the correct answer which is (Yes) 90.4% n=235 were matched with the correct answer, 1.2% n=3 answered wrong, and 8.5% n=22 the answer were sometimes. The answers have no significant differences because of P-value = 0.487 which is ($P > 0.05$).

Question 10 shows the practices regarding wound care of what if I feel confident to make recommendations to my team about the covers for wounds? Regarding the correct answer which is (Yes) 70.0% n=182 were matched with the correct answer, 4.6% n=12 answered wrong, and 25.4% n=66 the answer were sometimes. P-value is 0.001 which mean that the answers have a high significant difference.

Question 11 shows the practices regarding wound care of what if I'm comfortable in making recommendations to practitioners on appropriate wound dressings for my

patients? Regarding the correct answer which is (Yes) 68.8% n=179 were matched with the correct answer, 5.8% n=15 answered wrong, and 25.4% n=66 the answer were sometimes. P-value is 0.001 which mean that the answers have a high significant difference.

Question 12 shows the practices regarding wound care of what if nurses in my facility wear sterile gloves for dressing changes on chronic wounds? Regarding the correct answer which is (Yes) 90.0% n=234 were matched with the correct answer, 1.2% n=3 answered wrong, and 8.8% n=23 the answer were sometimes. P-value is 0.001 which mean that the answers have a significant difference.

The Average of Answers about Practice:

Correct Answer	Wrong Answer	Sometimes
81.2%	8.4%	10.4%

Table 4: Relationship between Nurses knowledge and practice regarding to wound care:

Descriptive Statistics		Total knowledge	Total practice	Mean	Std. Deviation
Total Nurses knowledge	Pearson Correlation	1	.427**	17.6077	3.93969
	Sig. (2-tailed)		.001		
	N	260	260		
Total Nurse practice	Pearson Correlation	.427**	1	15.4923	2.80029
	Sig. (2-tailed)	.001			
	N	260	260		

** . Correlation is significant at the 0.01 level (2-tailed).

The Mean and Standard Deviation of total Nurses knowledge were as (17.61 ± 3.94) , and the Mean and Standard Deviation of total Nurses practice were as (15.49 ± 2.80) . A correlation test was performed to determine relationship between Nurses Knowledge and practice, a positive moderate correlation found that when the total knowledge is high that will affect positively on nursing practice. P-Value of total knowledge and practice of nurses is (0.001) which mean that there are significances correlation were found between nurses Knowledge and Practice.

Table 5: Differences between descriptive characteristics-based on knowledge and practice of nurses regarding wound care:

Descriptive characteristics of (260n)	Total Knowledge of Nurses		Total Practice of Nurses	
		Mean \pm SD		Mean \pm SD
According to gender: Male (119n) Female (141n)	t: 0.653 p:0.515	(17.78 \pm 3.94) (17.67 \pm 4.33)	t: 0.019 p: 0.985	(15.49 \pm 2.64) (15.48 \pm 2.94)
According to experience: 0-1 Year (32n) 1-2Years (30n) 2-3Years (70n) >3 years (128n)	f: 35.178 p:0.001	(19.63 \pm 3.37) (16.33 \pm 2.72) (20.50 \pm 3.84) (16.05 \pm 3.77)	f: 12.607 p:0.001	(16.91 \pm 3.32) (16.47 \pm 2.94) (16.26 \pm 3.03) (14.49 \pm 2.07)
According to departments: Pediatric (83n) ICU (70n) Surgical (107n)	f: 17.251 p:0.001	(16.04 \pm 3.68) (19.80 \pm 3.45) (17.66 \pm 4.34)	f: 2.863 p:0.059	(14.90 \pm 2.60) (15.90 \pm 2.81) (15.68 \pm 2.89)

Differences between descriptive characteristics-based on knowledge and practice of nurses regarding wound care were tested by using Student T-test and ANOVA test formats. No Statistically significant differences were found between the knowledge and practice of nurses based on gender, ($t = 0.653$; $p = 0.515$) for knowledge, and ($t = 0.019$; $p = 0.985$) for practice of nurses.

Differences between years of practice and knowledge were tested; however, high significance difference was found because p-value of total knowledge and practice (0.001). The higher knowledge scores were found in nurses who have experience between 2-3 years the mean and Sd was (20.50 \pm 3.84). The second level was for nurses who have experience between 0-1 year mean and Sd was (19.63 \pm 3.37). Statistically significant differences were found between knowledge and practice of nurses according to work experience.

Moreover, there is significant differences were found among of knowledge of respondents ($f = 17.251$; $p = 0.001$) according to the participants departments, and no significant differences were found of nurses practice ($f = 2.863$; $p = 0.059$) according to the participants departments. According to practitioner's department, ICU nurses had a higher level of knowledge, the mean \pm Sd was (19.80 \pm 3.45), while the level of nurses parctice was almost similar regarding to the practitioner's department.

CHAPTER V

5.0 Discussion

Wound care management and dressing application were always daily procedures in nursing practise. The management of wounds is acknowledged as a vital nursing skill. This professional, in turn, requires evidence-based theoretical knowledge to ensure the quality of care on wound management, as well as to prevent the occurrence (Usher et al., 2018; Kielo et al., 2019). Nurses who give primary care to patients and have a good awareness of wound healing process can perform postoperative wound monitoring and suitable discharge education. Nursing skills, techniques, and knowledge grow on a regular basis in order to improve the quality of health care. Despite the fact that the wound management nurse practitioner (WMNP) model is an important technique for managing increased service demands, little is known about the distribution of its level of practice and their outcomes as regards wound care (Gibb., 2016).

Knowledge of wound care

The nurses have knowledge about wound care, 64.9% the average among correct choices, 19.7% choose the wrong answer, and only 15.4% do not know the answer. According to these findings the results found that the nurses have a mild knowledge about wound care which mean that the nurses have to improve their knowledge. In this study, items related to knowledge only 50 (19.2%) answered the correct answer about if using of povidone is indicated to clean chronic wounds which means that nurses need to improve their knowledge about chronic wound cleaning solutions. Also as presented in Table 3, it is emphasized that 124 (47.7%) of the nurses gave wrong answers on this good bacterial in chronic wounds and just 33 (12.7%) give the right answer. It was reported that the proportion of nurses who asserted knowledge that roofing moist gauze drought are most suitable for the treatment of chronic wounds clean and granulation tissue were below half (47.7%).

Based on the results from this empirical study on the knowledge and practice regarding wound care, 260 participants who worked with the hospital agreed on the proper method involved in wound care with varied gender, ages, levels of experience.

The Mean and Standard Deviation of the age were as (28.06 ± 4.92) , the questionnaires 45.8% (n: 119) were from males and 54.2% (n: 141) from females.

Nurses' knowledge was, in some cases, found to be sufficient, but poor application negatively affected competence in practice. (Gillespie *et al.*, 2013) This was also echoed by (Yao *et al.*, 2013; and Sürme, *et al.* 2018) as they agreed that a nurse should have the knowledge to evaluate and rehabilitate the patient's general condition, relieve pressure on the wound surface, keep the wound moist, cover the wound with a sterile gauze bandage or surgical drapes, when necessary, keep the wound temperature at a constant level, monitor blood values, and evaluate the wound every day for infection, serosity, and hematoma, and intervene with infection. On the contrary, this result was not backed up in a study conducted in Sao Paulo, which found that the percentage of nurses with insufficient expertise in wound management was rather high (Ferreira, *et al.*, 2014). The findings of that research (Ferreira, *et al.*, 2014) can be attributed to insufficient job experience and a lack of specialized training in wounds care.

Majority (89.2%) of the study participants reported that they had received sufficient education on chronic wounds care in their basic nursing education program. According to Wound, Ostomy and Continence Nurses Society (2018), it was confirmed that being a wound care specialist is essential for preoperative and postoperative care, thereby reducing the incidence of complications and improve wound care proficiency. In contrast, although (Grothier 2018) also recognized the need for improved teaching in evidence-based wound care, but he claimed there are particular deficiencies in undergraduate nursing education. This was resonated by (Ferreira, Rigotti *et al.*, 2014; and deFaria *et al.* 2016), who discovered that 71.4% and 67.3% of nurses, respectively, reported having insufficient formal wound care education, and (McCluskey and McCarthy 2012) advocated for the implementation of better wound care education programs for nurses working in the acute setting. (Gillespie *et al.*, 2012) made no specific reports on the existence or effectiveness of formal wound care education or that gained in practice, but they did confirm the evidence of a significant relationship between higher education or specific tissue viability training and favourable attitudes toward evidence-based wound care, implying that wound care education improves practice. This may be contended to be of primary interest in the primary care sector, as complex care is increasingly being

delivered in the community in a variety of areas, and ineffective wound management would have a major effect (Aquolah, 2019).

Practice of wound care

In this study the nurses have practiced with wound care, 81.2% the average among correct choices, 8.4% choose the wrong answer, and only 10.4% choose sometimes the answer, findings showed that majority of the nurses who participated in this study had used sterilized solution for cleaning wound and they had always checked and assessed the wound site condition of their clients. (Mwakanyamale et al., 2019) similarly found that good practice of wound care was observed in the application of dressing solution as recommended (85%), 87 percent poured antiseptic solution into the sterile receiver, dry sterile dressing was applied by (90%), arrangement and setting up of dressing forceps and other items that may be required in order of their application using forceps (20%), use of forceps to dip gauze into antiseptic solution (35%), and cleaning of the wound cleaning from least contaminated to most contaminated (34%). In contrast, (Moran and Byrne 2018) researched that barely 7% of the nurses would use Betadine solution to cleanse a wound and less than 10% claimed to use normal saline solution to clean wounds. These treatments are commonly used for skin antisepsis prior to invasive procedures; however, they are not advised for wound washing. According to the most recent NICE (2017) recommendation, all surgical wounds should be covered with an adequate dressing, and normal saline should be used solely for wound washing within 48 hours of operation. The guideline, however, does not define when the dressing should be removed, leaving nurses in the dark about when the initial postoperative dressing should be removed. To solve this research topic, more study in postoperative wound care is needed.

Findings in this study also showed that not less than 96.5% of the participants had practised aseptic technique in wound dressing. In similarity, (Christiana & Salawu 2020) reported the mean score of the practice level of the participants on aseptic technique in the experimental group was 13.0 (92.9%). This result is also in congruent with the study of (Ding et al., 2017) who researched on Nurses' practice in preventing postoperative wound infections. Nurses were reported setting up aseptic fields and

using sterile wound dressing kits in 85% of wound dressing sessions (n=51). However, a substantial percentage (38.1%) of nurses observed in that study did not use clean gloves, and 14.3% of the nurses' contaminated wounds/dressings, consequently breaking aseptic technique. When sterile gloves were required, only three nurses (16.7%) used clean gloves, while one nurse (5.5%) wore sterile gloves but touched regions outside of the aseptic fields (Ding, et al., 2017).

Result from this study as shown in table 4, revealed that practice on wound care, large percentage of the participants matched the correct answers which means that the nurses have a piece of good practices with wound care, 81.2% the average among correct choices, 8.4% choose the wrong answer, and only 10.4% they choose sometimes the answer. This correlate with a study conducted by (Gruber et al., 2020) that evidence-based practice should be adopted nurses in order to prevent and treat wound care, given the importance of quality of care in wound care.

Result from this study as shown in table 4, for the daily assessment of the skin of patients, 145 (47.7%) of nurses said that they conduct and 107 (41.2%) said they don't do this assessment. Each patient should have a skin integrity risk assessment performed on admission to the unit and every 24 hours thereafter using a tool to identify existing wounds or increased risks for wounds so that interventions can be initiated immediately to prevent further injury, according to evidence-based best practice (Gadd & Morris, 2014). To corroborate this, (Atkin et al., 2020) stated that a 24-hour skin assessment during the evaluation period revealed an improvement in exudate management-related skin condition. However, studies have reviewed those nurses did not receive much wound care or skin integrity education during their studies as a student (Kielo, et al., 2019). However, students reported that the teaching they received had developed their knowledge and skills at maintaining skin integrity for all patients (Ousey et al., 2013; Downing, et al., 2020).

As regards if nurses advise patients to shower with anti-microbial agent preoperatively, 30.0% n=78 answered wrong, and 31.2% n=81 the answer were sometimes while only 38.8% n=101 were matched with the correct answer. The managers should reassess and evaluate the nurses' practices continuously. Similarly, (Adejumo & Ilesanmi., 2016) mentioned the mean wound assessment practice score was 21.1 ± 14.2 . Only 5% of the respondents had a good wound assessment practice

(Adejumo & Ilesanmi, 2016). In contrast, (Sürme et al., 2018) noted that more than half of the nurses stated that they always performed practices in the subtitle of mobilization and nutrition. In the same vein, another study (Galazka, 2021) reported that almost half of the nurses in that survey (47.6 percent) did not view wound care as a nursing responsibility. They also discovered that more than half of the nurses in their research did not consistently deliver wound care information to patients upon discharge. (Bulut et al., 2012) these findings indicated that nurses lacked an appropriate understanding of nursing law. This might also be related to the fact that in the hospitals where the study was conducted, the wound dressing is usually done by medical personnel other than nurses. Nurses must understand the healing process and the elements that influence surgical wound care in order to make wound management decisions and evaluations (Bulut et al., 2012). Consequently, (Yao et al., 2013) mentioned that the quality of wound care provided in clinics is critical for the quick and painless healing of surgical wounds. As a result, one of the essential components of nursing care is wound care provided in surgical clinics. The nurse is responsible for providing mechanical cleansing, irrigation, and dressing of the wound, establishing practice registration forms for the wound, and keeping up to date on wound care concepts and products by keeping up with new advancements, according to Turkish nursing regulations (Mevzuat, 2021).

Finding in this study showed that a positive moderate correlation when the total knowledge is high that will affect positively on nursing practice. P-Value of total knowledge and practice of nurses is (0.001) which mean that, high significances different were found between nurses Knowledge and Practice, Medium positive correlation was found between the knowledge and practices of respondents. The most significant correlated domains were aetiology and development and responsibility in pressure ulcer prevention (Grešš Halász, 2021).

CHAPTER VI

6.0 Conclusion

A knowledge gap was identified between wound care knowledge and practice. There is therefore a need to undertake work to translate current trends in wound care into clinical practice among nurses in acute and community-based practice. The aim should be establishing links between the practical and the scientific evidence about wound care.

According to the findings of this study, a large majority of nurses had insufficient understanding about wound care. Nurses rarely mentioned professional development sources (training, courses, etc.). The results of this study point to the high number of nurses with inadequate knowledge about the care of wounds. The academic was reported to be inadequate in wound care. The data gathered indicates that it is important to differentiate the professional context of nurse expertise and their practise, therefore contributing to an educational strategic planning aiming at a plan of action for the adoption of suggestions based on evidence-based practise in wound care. Because shortcomings in the nurses' understanding of wounds care were detected, the findings of this study can aid in the training process and lead incentive methods to evidence based practice as regards wound dressing and this will serve as a foresight for the policy makers. A satisfactory level of knowledge about wound care not only decreases wounds complications, repeated admissions, hospitalization duration, and costs but also contributes to the quality of life among the patients.

7.0 Results and Recommendations

7.1 Results

In this study, the questionnaires contained 12 questions about the knowledge of wound care, 10 out of all answers of the participants matched the correct answers which means that the nurses have a piece of good knowledge about wound care, 64.9% the average among correct choices, 19.7% choose the wrong answer, and only 15.4% they do not know the answer.

In this study, the questionnaires contained 12 questions about the practices of wound care, 12 out of all answers of the participants matched the correct answers which means that the nurses have a piece of good practices with wound care, 81.2% the average among correct choices, 8.4% choose the wrong answer, and only 10.4% they choose sometimes the answer.

7.2 Study Limitations

The answers of the participants may does not reflect the real practices.

7.3 Recommendations

My recommendation is to monitor the content of the education in order to enhance efficiency and ensure durability and reality. Also, wound care protocols should be developed, and research conducted for standardization in institutions for general usage. In the nursing laws impacting individual nurses' awareness should be raised of the authorities and duties of nurses. The data gathered indicates that it is important to differentiate the professional setting of their knowledge and rethink their practice, thus contributing to an educational strategic planning aimed at a plan of action for the use of recommendations based on evidence-based practice. Another recommendation is also to develop wound care protocols and conduct studies on standardizing these protocols for common use in the hospitals.

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APPENDICES

The questionnaire forms

Nurses' information sheet

Dear Respondent,

I will be very grateful if you will take your time to participate in this survey. The survey aims to assess your knowledge and practices regarding to wound care.

You have been identified as one of the participants to respond to the questionnaires used in this research work and however you are free to withdraw at any time you deem necessary.

I encourage you to ask any question that is not clear enough to you; please feel free to answer the questions accordingly without withholding any vital information that may be of great help. I assure you that the information you provide will be treated as highly classified confidential document. Your identity is well protected because the information you provide on this questionnaire will not be shared with your colleagues.

Thank you for your participation.

Consent form

I have read and understood the information sheet provided above and the explanation given by the researcher. I hereby voluntarily consent to participate in the research.

Participant: Witness:

Signature: Signature:

A. Socio-demographic characteristics of study participants

1. Gender: Male Female

2. Age: _____

3. Marital Status: Single Married Divorced

4. Working experience: (0-1 year) (1-2 years)

(2-3 years) More than 3 years

5. Ward: _____

B. Questions on Knowledge about Wound care:

No	Questions	YES	NO	I don't know
1.	Povidone is indicated to clean chronic wounds.			
2.	Roofing moist gauze drought are most suitable for the treatment of chronic wounds clean and granulation tissue.			
3.	In chronic wounds, the good bacteria are these ones that are dead.			
4.	The wound assessment is a cumulative process that includes observation, data collection and evaluation.?			
5.	Moist wound therapy is the gold standard for chronic wound management.			
6.	Classic signs of infection may not be present in patients with chronic wounds or in those who are immunosuppressed.			
7.	Topical enzymes are effective for removing necrotic tissue in chronic wounds.			
8.	Increase pain and wound discharge indicate surgical site infection.			
9.	The size and site of the wound affect the period of wound healing.			
10.	Prolong hospitalization delay the healing process.			
11.	Wound pain should be rated by the clinician, not the patient.			
12.	I received sufficient education on chronic wounds in my basic nursing education program.			

C. STATEMENTS ON PRACTICES REGARDING WOUND CARE:

Que. no.	Statements	Yes	No	Sometimes
1.	In Wound care, are gloves used to exchange sterile dressings for chronic wounds?			
2.	The skin assessment part of the daily evaluation of all your patient.			
3.	I perform aseptic technique while wound dressing.			
4.	At your place of professional presence for standards (protocols, manual, etc.) about the care of patients with wounds?			
5.	I advise my patient to shower with anti-microbial agent preoperatively.			
6.	I use sterilized solution for cleaning the wound.			
7.	My facility has a policy for how often a wound assessment should be completed and documented.			
8.	I check and assess the wound site condition.			
9.	Pressure redistribution products (such as beds, special mattresses, upholstered chairs) are used in your workplace to prevent PUs?			
10.	I feel confident to make recommendations to my team about the covers for wounds.			
11.	I'm comfortable in making recommendations to practitioners on appropriate wound dressings for my patients.			
12.	Nurses in my facility wear sterile gloves for dressing changes on chronic wounds.			

Ethical approval from Institutional Review Board



NAER EAST UNIVERSITY

SCIENTIFIC RESEARCH ETHICS COMMITTEE

21.07.2020

Dear Prof. Dr. Ümran Dal Yılmaz

Your application titled "Knowledge and Practice of Nurses Regarding Wound care" with the application number NEU/2020/80-1117 has been evaluated by the Scientific Research Ethics Committee and granted approval.

Prof. Dr. Rüştü Onur

Near East University

Scientific Research Ethics Committee Director

Monday, June 15, 2020

To the Chairman of the Near East University, Institutional Review Board,

Please find the study, entitled “**Knowledge and Practice of Nurses Regarding Wound care.**”, which will be conducted by Prof. Ümran Dal Yılmaz and Master degree student.Mohammed Sameer Abu Msallam. I would like the mentioned study to be evaluated by the Institutional Review Board according to its suitability to ethical norms.

With respect,



Prof. Ümran Dal Yılmaz
(Principal Investigator)



مستشفى جبل الزيتون

Jabal Al-Zaitoon Hospital

Ref : 9335/20

Date : 1/9/2020

Dear Prof Umran DAL YILMAZ ;
Dean, Near East University Faculty of Nursing

Approval Letter For Research Project about "Knowledge and Practice of Nurses
Regarding Wound Care "

In reference to your letter dated 31.8.2020, ref.no: HF -473/2020, related to the above mentioned research project to be conducted by Mr. MOHAMMED SAMEER ABU MSALLAM , it is my pleasure to informed you that we have approved applying the questionnaire at our hospital .

Sincerely,

General Manager

Dr. HAITHAM SA'ED KHALAF



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المستشفى الإسلامي

عمان - الأردن

تلفون : ٥١٠١٠١٠ فاكس : ٥١٠١٠١١
ص.ب : ٩٢٥٦٩٣ عمان ١١١٩٠ الأردن
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Ref : 15/2020/2241

Date : 13th August 2020

الرقم : ٢٢٤١/٢٠٢٠/١٥

التاريخ :

الموافق :

Dear Prof. Ümran Dal Yilmaz

Dear, Near East University Faculty of Nursing

E-mail: info@neu.edu.tr

SUBJECT: APPROVAL LETTER-RESEARCH PROJECT: KNOWLEDGE AND PRACTICE OF NURSES REGARDING WOUND CARE

In reference to your letter dated 23/07/2020, ref. no. HF-468/2020, related to the above research project to be conducted by Mr. Mohammed Sameer Abu Msallam/master student in your faculty of nursing, it is my pleasure to inform you that the IRB at the Islamic Hospital, Amman-Jordan has approved conducting the study at our Institution.

The student is required to provide copy of the final version of the study outcomes to the IRB.

General Director


Dr. Mohammad Al-Thnaibat



بجملتي
- General File.
- IRB File.
- CC/ Nursing department.

S043D

MOHAMMED ABU MSALLAM



Contact



Amman-Jordan



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Languages

- Arabic – Native
- English – Very good
- Turkish – Good

Hobbies

- Writing
- Football
- Travel
- Swimming

References

- **Prof. Nidal F. Eshah**
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- **Prof. Rana Obeidat**
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Summary

Born in Jordan, 18th of April, 1994

Looking for a challenging career with a reputable organization to utilize and improve my knowledge and experience to the maximum to contribute the growth and development of the organization. Seeking a challenging position in the hospital where I belong to; a position where I could utilize my knowledge and skills in achieving the growth and development of the career. Strong familiarity with medical procedures and sanitation requirements. Self-motivated, help day-to-day operations by performing anything the job require. Focused on helping the business achieve short- and long-term goals.

Skills Highlights

- Strong decision maker.
- Creativity.
- Good language skills.
- SPSS Program: Excellent.
- Microsoft Office Programs and skills: Excellent.
- Ability to motivate the staff.
- Teamwork skills.
- Leadership skills.
- Good communication skills.
- Resistance to stress.
- Time Management skills.

Experience

- **Aug 2020 – May 2021**
Staff Nurse in ICU Isolation Department (Jabal Al-zaytoon Hospital – Zarqa, Jordan).
- **Oct 2020 – Apr 2021**
Clinical instructor at Zraqa private University.
- **May 2021 – Jul 2021**
Staff Nurse in Medical and Surgical floor (Al-Abdali Medical Hospital).
- **Jul 2021 – until now**
Staff Nurse in ICU department (Ministry of Health of Jordan – Northern Badiah Hospital).
- **Nov 2021 – until now**
Clinical instructor at Zraqa private University.

Education

- **Aug, 2018**
Bachelor's degree in Nursing Science, I have graduated from Zarqa Private University academic year 2017/2018, (Jordan-Zarqa).
- **2019 - 2022**
Master's Degree in (Surgical Nursing) Department in Near East University, Turkey, Northern Cyprus.
G.P.A 3.87/4 (High honors student).

Certifications

- Mathematical Modeling in Health Certificate (Attendance), DESAM Institute, Near East University, Nicosia, 2019.
- Participated in The Second Nursing Scientific Day as Organizer, that was held at the Faculty of Nursing / Zarqa University - Jordan, 15th of March, 2018.