UTILIZATION AND PERCEIVED EFFECTIVENESS OF HONEY IN WOUND MANAGEMENT BY NURSES IN UNIVERSITY OF BENIN TEACHING HOSPITAL BENIN-CITY, EDO STATE

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OCTOBER , 2025

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IN PARTIAL FULFILLMENT OF THE AWARD OF THE DEGREE OF BACHELOR OF NURSING SCIENCE, FACULTY OF NURSING SCIENCES, UNIVERSITY OF BENIN, BENIN CITY.

OCTOBER , 2025

DECLARATION

This is to declare that this research project titled **"UTILIZATION AND PERCEIVED EFFECTIVENESS OF HONEY IN WOUND MANAGEMENT BY NURSES IN UNIVERSITY OF BENIN TEACHING HOSPITAL."** was solely carried out by MONDAY IMAOBONG. It will solely be the result of my work except where stated otherwise by reference or acknowledgement as being derived from other person (s) or resources.

EXAMINATION NUMBER: _____

DEPARTMENT SCHOOL: NURSING SCIENCE, SCHOOL OF BASIC MEDICAL SCIENCE, UNIVERSITY OF BENIN, BENIN CITY, EDO STATE.

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Date: _____

CERTIFICATION/APPROVAL

This is to certify that this research project titled **"UTILIZATION AND PERCEIVED EFFECTIVENESS OF HONEY IN WOUND MANAGEMENT BY NURSES IN UNIVERSITY OF BENIN TEACHING HOSPITAL"** was carried out by **MON**DAY IMAOBONG with **Mat No. BMS2009022** in the department of Nursing Science, under the supervision of **DR. MRS C ENUKU**

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ABSTRACT

This study explored the utilization and perceived clinical effectiveness of honey in burn wound management among nurses at the University of Benin Teaching Hospital (UBTH), Benin City. Burn injuries pose significant challenges in clinical care, particularly in resource-limited settings where affordable and accessible treatment options are essential. Honey, with its antibacterial and wound-healing properties, has been increasingly recognized as a viable alternative. A descriptive cross-sectional survey design was adopted, and a convenience sampling technique was used to select 258 nurses. Of these, 249 completed the questionnaire correctly, yielding a response rate of 96.5%. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26.0. Findings revealed that 67.5% of nurses had personally used honey in burn wound care, and 72.3% reported observing its use in clinical practice. A total of 61.0% indicated that they initiated the use of honey even without prior doctor approval, while 65.8% used it when conventional materials were unavailable. Only 34.1% of respondents reported receiving formal training on the use of honey in wound care, and just 29.7% stated that their departments had standard protocols for its use. Overall, the utilization of honey was rated high, with a grand mean score of 2.6 (cutoff = 2.5). On perceived clinical effectiveness, 74.3% of nurses believed honey facilitates faster wound healing, 70.2% agreed it reduces the risk of infection, and 66.7% reported it helps alleviate pain. A grand mean of 2.7 indicated a high perception of honey's clinical effectiveness. In conclusion, the study demonstrated a substantial level of honey utilization and positive perception of its effectiveness among nurses at UBTH. The study recommends integrating honey-based protocols into standard practice, expanding training programs, and conducting further clinical trials to reinforce its evidence-based application in wound care.

Keywords: Utilization, Effectiveness, Honey, Wound, Management, Nurses

DEDICATION

This project work is dedicated to the **ALMIGHTY GOD** who has been my constant source of help and strength in my academic journey.

To my beloved Parents, Pastor Monday Sunday Umoh and Pastor (Mrs) Iboro Monday whose unwavering support both financially and morally has kept me outstanding and fostering success all through my academic year.

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

For thousands of years, honey has been used to treat wounds and other ailments. Honey was employed for its therapeutic and health benefits by the ancient Greeks and Chinese. It has gained prominence in wound treatment in recent years because it is thought that honey's capacity to obstruct bacterial communication prevents bacteria from becoming resistant to it. Honey has a number of qualities that make it appropriate for wound treatment. Honey's high osmolality extracts fluid from wounds in a manner akin to negative pressure wound therapy (Jan *et al.,* 2021).

Honey's strong acidity causes hemoglobin to release more oxygen, makes the wound environment less favorable to microorganisms. In many honeys, the antibacterial-properties come from hydrogen peroxide which is created by glucose oxidase from bees. Since centuries ago, honey has been used to treat wounds. Honey has been used to treat burns, wounds, cataracts, skin ulcers, and diarrhea (Jan *et al.,* 2021).

Since ancient times, honey has been utilized for its therapeutic qualities and has shown promise in the treatment of wounds. Honey dressings promote healing, reduce debridement, ensure a successful graft, eliminate dry crust, stop dry scabs from forming on burns, clean the wound, make it easier to separate sloughs, deodorize the wound, soothe the wound, and reduce the formation of scars (Fernández-Araque *et al.,* 2024). Applying and removing honey dressing is simple. It helps cure infected wounds because of its antibacterial properties. According to Winny & Widi, (2025), using honey as a treatment for infected wounds results in the wounds becoming sterilized in 3–10 days.

The Egyptians were the first to record using honey to treat wounds about 200 BC. Honey has been utilized by the Egyptians for both embalming the dead and as a cosmetic. Numerous illnesses have been treated using it. Numerous studies from the early 20th century attested to the benefits of treating burn injuries with this natural therapy. But the use of honey was supplanted by western medicine when antibiotics and other surgical techniques advanced. Due to the widespread useantibiotic resistance to various antibiotics has developed and many multi resistance microorganisms are present. It's the introduction of newer antibiotics decreased, the emergence of alternative medicine was reborn. Hence, the interest of using honey for wound management reinitiated (Winny & Widi, 2025). Honey contains approximately 40% fructose, 30% glucose, 5% sucrose, and 20% water. It also contains several amino acids, anti-oxidants, vitamins, mineral, glucose oxidase which produce hydrogen peroxide and gluconine acid which give the honey an acidic PH 3.2-4.5.

Due to its natural ability to promote the production of granulation tissue, stimulate tissue growth, and decrease oedema, inflammation, and collagen synthesis, honey has been shown in both animal and human trials to increase wound contraction and wound epithelization. Honey has the capacity to lessen discomfort, and decrease the frequency of post-operative adhesions in intra-abdominal tissue (Winny & Widi, 2025).

1.2 Statement of the Problem

Since the 19th century, honey's antimicrobial properties have been recognized. In recent times, honey's strong anti-antibiotic properties have heightened interest in its possibilities. Honey treatment resulted in significantly more recovery in 7 days compared to modern medicine, according to an experimental study conducted in India on patients with partial thickness or superficial burn wounds covering less than 40% of the body's total surface. However, it has been

noted that one of the challenges to honey's therapeutic usefulness is its insufficient antibacterial action (Beáta, Lucia, Kvetoslava & Jarmila, 2025). The researcher saw that a patient with a deep wound had rapid tissue granulation as a result of the honey used to pack the wound after dressing it during her clinical posting at the Male Medical Ward at University of Benin Teaching Hospital. Based on this observation, the researcher's interest was aroused to find out the nurse's knowledge on the utilization of honey in wound management.

1.3 Objective of the study

The broad objective is to ascertain the utilization and perceived effectiveness of honey by nurses in the management of wounds in University of Benin Teaching, Edo State.

Specific Objectives of the Study

1. To determine the use of honey by nurses in the management of burns wound in University of Benin Teaching, Edo State.
2. To determine the level of perceived clinical effectiveness of honey for the management of wounds in University of Benin Teaching, Edo State.
3. To identify the challenges of honey in the management of wound in University of Benin Teaching, Edo State.

1.4 Research Question

1. What is the level of utilization of honey by the nurses in the management of burns wounds?
2. What is the level of perceived clinical effectiveness of medical honey for the management of wounds?
3. What is the factors influencing honey utilization in the management of wound?

1.5 Significance of the Study

This study, if published and communicated will provide empirical evidence to help increase the level of awareness and skill of nurses on the utilization of honey in the management of burns wound.

Findings from this will also benefit the patients as it will help in the management of their wounds at the shortest time possible, which will enhance its epithelization thereby decreasing their time of hospital stay.

As the length of hospital stay of patient decreases, the cost of hospital bills also decreases thereby alleviating the burden of bill payment of their families.

This study will also increase the rate of productivity of the nation and serve as a basis for further studies on the same or similar topics.

1.6 Delimitation/Scope of Study

This study is delimited to ascertain the utilization and perceived effectiveness of honey by nurses in the management of wounds in University of Benin Teaching, Edo State.

1.7 Operational Definition of Terms

Utilization: The extent of usage of honey in wound dressing in hospitals.

Perceived Effectiveness: The subjective belief of the degree to which honey achieve good results in wound management.

Nurses: Health professional that care for patients or clients.

Wound: A trauma or incision to any of the body, especially that caused by physical means.

Dressing: Application of material, to a wound for protection, absorbance, drainage etc.

Honey: A viscous, sweet fluid produced from plant nectar by bees.

CHAPTER TWO

LITERATURE REVIEW

This chapter entails the review of relevant literature related to the utilization and effectiveness of honey in wound dressing, was reviewed under the following headings

1. Conceptual framework
2. Theoretical framework
3. Empirical studies
4. Summary of literature review

2.1 Conceptual Review

2.1.1 Concept of honey

Honey is a naturally occurring material that is made by honeybees (Apis mellifera) from the sweet, delicious, viscous nectar of flowers. Since ancient times, it has been utilized as a food and medicine. Honey is a complex mixture and presents very great variations in composition and characteristics due to its geographical and botanical origin, its main features depending on the floral origin or the nectar foraged by bees. The weather and humidity levels inside the hive, the conditions of the nectar, and the way the honey is treated during extraction and storage all affect the composition and quality of honey. The way the bees are fed affects the honey's composition (Mashbari *et al.,* 2024).

Honey is regarded as a significant component of traditional medicine and has been found to have over 180 different chemicals. Around the world, honey has many practical purposes, including in human and veterinary treatment, food systems, and religious and mystical rituals. It is a very important energy food and is used as an ingredient in hundreds of manufactured foods, mainly in

cereal-based products, for its sweetness, color, flavor, caramelization, pumpability and viscosity (Mashbari *et al.,* 2024).

Fig. Honey (Mashbari *et al.,* 2024).

2.1.1 Chemical compositions of honey

The composition of honey basically varies to the floral source, but seasonal, environmental factors and processing conditions are also important.

1. **Carbohydrates**

Sugar in honey is not a single species, but consists of three kinds of sugar. These are the fruit sugar (fructose), which has among the highest (41%), grape sugar (glucose), which has about 34% of ordinary sugar (sucrose) which is between 1 and 2%. The ratio of one type of sugar to other depends of the source, i.e., flower pasture, and to some extent on enzyme invertase, which breaks

down regular sugar in grape and fruit. This enzyme is located in the flower from which the bees collect nectar, but it is also present in the bee's body (Mashbari *et al.,* 2023).

2. Water

The water content of honey (water-in-honey) is the quality aspect that determines the ability of honey to remain fresh and to avoid spoilage by yeast fermentation. Raw honey can have a waterin-honey content of less than 14% and the lower the water content the higher the perceived value of the honey. It is internationally recognized that good quality honey should be processed at less than 20% water content. Low water content is desirable because honey may begin to ferment and lose its fresh quality if the water-in-honey is greater than 20%. Unpasteurized honey ferments because it contains wild yeast. However, due to honey's high sugar concentration these yeasts are less likely to cause fermentation in honey with low water content (Primavera & Marzolani, 2024).

3. Minerals and trace elements

Honey contains varying amounts of mineral substances. The main element found in honey is potassium, besides many other elements. Potassium, with an average of about one third of the total, is the main mineral element, but there is a wide variety of trace elements Several investigations have shown that the trace element content of honey depends mainly on the botanical origin of honey. Minerals has about 3.68% (Fernández-Araque *et al.,* 2024). Although this part of the honey does not make a large amount, minerals in honey raise the value of honey for human consumption. Honey contains most of the minerals: potassium, chlorine, sulfur, calcium, sodium, phosphorus, magnesium, silicon, iron, manganese and copper. When the observed mean value, dark types of honey are richer in minerals than lighter. Of course, singles can find a darker species that are poorer than some lighter species (Fernández-Araque *et al.,* 2024).

4. HydroxyMethylFurfuraldehyde (HMF)

HMF is a six-carbon heterocyclic organic compound containing both aldehyde and alcohol (hydroxymethyl) functional groups. The ring of the structure is centered on furan moieties, whereas the two functional groups, i.e., formyl and hydroxy-methyl groups, are linked at the second and fifth positions, respectively. HMF is a solid, yellow substance that has a low melting point but is highly soluble in water (Khairan *et al.,* 2024).

HMF is a breakdown product of fructose (one of the main sugars in honey) that is formed slowly and naturally during the storage of honey, and much more quickly when honey is heated. The amount of HMF present in honey is the reference used as a guide to the amount of heating that has taken place: the higher the HMF value, the lower the quality of the honey is considered to be. Some countries set an HMF limit for imported honey (sometimes 40 milligrams per kilogram), and honey with an HMF value higher than this limit will not be accepted (Khairan *et al.,* 2024).

5. Acidity and pH

Acids are also components of honey. Before it was believed that bees by stomach inserted bee venom into the cell honeycomb with honey and make it so conserved. Given that one of the main components of bee venom is formic acid, it was thought that the honey has a formic acid. Even some people urged to other not to use honey because of that.

Studies have shown that they are completely different acids that are composed in honey, mostly apple and lemon acid. Honey is a buffer, that means that that its pH does not change by the addition of small quantities of acids and bases. The buffer capacity is due to the content of phosphates, carbonates and other mineral salts (Tang, Chen & Ran, 2024).

6. Aroma compounds and phenolics

Honey volatiles are the substances responsible for the honey aroma. Research on honey volatiles started in the early 1960s. Recently, by studying volatiles isolated from honey, it was found that most volatile compounds originate probably from the plant, but some of them are added by bees (Abdel-Salam, Sherif & Mahmoud, 2022).

Until the present time about 600 compounds have been characterized in different honeys. Phenolic acids and polyphenols are plant derived secondary metabolites. These compounds have been used as chemotaxonomic markers in plant systematics. They have been suggested as possible markers for the determination of botanical origin of honey. Dark colored honeys are reported to contain more phenolic acid derivatives but less flavonoids than light-colored ones (Abdel-Salam *et al.,* 2022).

7. Amino acids and proteins

Proteins come in honey from nectar and pollen as an integral parts of plants. Proteins in honey may be in the form of a very complex structure or in the form of simple compounds, i.e., amino acids. The content of amino acids and proteins is relatively small, at the most 0.7 %. Honey contains almost all physiologically important amino acids. The main amino acid is proline is a measure of honey ripeness. The proline content of normal honeys should be more than 200 mg/kg. Values below 180 mg/kg mean that the honey is probably adulterated by sugar addition (Carlos, Frank, Hilde, & Niels, 2022).

2.1.2 Uses of Honey

1. **As food for humans**

   Honey is a useful source of high-carbohydrate food, and usually contains a rich diversity of minor constituents (minerals, proteins, vitamins and others), adding nutritional variety to human diets (Alvarez-Suarez, Giampieri & Battino, 2023).

2. **For bees**

   Bees produce honey to act as a food store for the colony for periods when there are no flowers, or the climate is adverse. For example, during the winters of northern, temperate countries, few plants are flowering between October and March, and bee colonies need honey stores to survive throughout this flowering dearth period, and when it may be too cold to leave the nest. In tropical countries, bees need to survive through seasons when there are no flowers, periods of drought, or when bees are not able to forage because of rain or other adverse weather (Willix, Molan, & Harfoot, 2022).

3. **Medicinal uses of honey**

   The ideal topical preparation for wounds should meet the following criteria which is present in nature honey.

   Wound healing activity

   Several animal studies and clinical trials have examined the application of honey for acute and chronic wounds including bum injuries, and have demonstrated that it limits the amount of edema, improves granulation and epithelization in the proliferative phase while decreasing total wound healing time, reduces scarring and contractures in patients with bum wounds (Ankan *et al.,* 2022), without adverse effect (allergy or toxicity) at all. Due to its low adherence in wound surface, honey causes minimal pain during application and upon removal preserving the newly forming

granulation tissue (Ankan *et al.,* 2022).

There is evidence that honey can heal partial thickness burns more quickly (around 4-5 days) than conventional dressings; and post-operative infected wounds can be treated by honey more effectively than by use of antiseptic or gauze. In a study by (Ankan *et al.,* 2022), a total of 12 patients with chronic foot ulcers utilized natural honey as an effective alternative to more expensive, advanced wound products. After the wound rinsing with normal saline, natural honey was applied and the-wound was covered by glycerin-impregnated gauze (Hanaa, 2021).

Patients were followed on a daily basis for an average of 4 weeks. The results showed that all ulcers healed with no contractures or scars with a mean healing timer of 3 weeks. Moreover, there was a 75% reduction in the dressing budget of the health center and a high level of satisfaction among both health professionals and patients (Hanaa, 2021). Also, patients' pain- levels were reduced significantly after using natural honey. Similar evidence has been observed when Manuka honey gel was used for treatment of partial-thickness facial burns. The healing time was congruent with or better than what would been expected with standard treatment (Hanaa, 2021). No abnormal bacterial growth was reported and the patients reported overall satisfaction with the treatment and cost of the treatment. It has been suggested that Manuka honey is a clinically and economically valuable, treatment for partial-thickness facial burns time to healing.

A recent study by Malik, Rahman, Agrawal, & Haque, (2020) showed that honey dressings can promote better results for burn wounds than the silver-based dressings (i.e., silver sulfadiazine), the currently extensively used method used to treat a variety of acute and chronic wounds.

The presence of antibiotic resistant S. aureus in wounds is a cause for concern due to its capacity to acquire resistance to multiple antibiotics that make the treatment of wounds difficult. Some authors showed that Manuka honey effectively inhibited the strains of vancomycin-intermediate

S. aureus and the clinical strains of Vancomycin-Sensitive S. aureus (VSSA) in the clinical setting. It has been indicated that Manuka honey at low concentration (≤6% (w/v)) can inhibit the growth of clinical isolates of S. aureus and thus can be used as a treatment option to help decontaminate wounds infected with antibiotic-resistant organisms like S. aureus. Besides that, clinical and laboratory data indicate that natural honey is effective against a variety of common pathogens (Winny & Widi 2025).

Honey facilitates wound healing by its ability to create an effective viscous barrier on the wound surface, thus preventing the invasion of microorganisms present in the wounds and can remove any dead tissue that may provide a favourable environment for the growth of microorganisms. The acidic pH of honey (3.2 to 4.5) inhibits growth of most pathogenic bacteria within wounds, and increases production of hydrogen peroxide from the enzyme glucose oxidase at 1:1000 concentration. This is less than the conventional rinse solutions but enough to inhibit bacterial growth without compromising the new granulation tissue (Ankan *et al.,* 2022). Thus, when applied topically, honey is capable of cleaning infection from a wound and improving healing. Nevertheless, the wound healing capacity of honey is not only through its antiseptic nature, but also through its immunomodulatory effects, which boost the immune system to fight infection. The components in honey related to its immunomodulatory properties have not been yet fully identified, but are being attributed to lipopolysaccharide (LPS), a 5.8 kDa component, major royal jelly protein 1, arabinogalactans, polyphenols, and antioxidants (Tang, Chen & Ran, 2024).

How to use honey on wounds

The following are general tips on how honey may be used for wound care:

The amount of honey used depends on the amount of fluid, exuding from wound. Large amount of fluid exudants require substantial amounts of honey to be applied. The frequency of dressing changes depends on how rapidly the honey is being diluted by the exudates. This should become less frequent as the honey starts to work on healing the wound. Occlusive dressings help to prevent honey oozing out from the wound (Anand *et al.,* 2023). It is best to spread honey on a dressing and apply this to the wound than apply the honey directly onto the wound. Dressing pads preimpregnated with honey is commercial available and provides an effective and less messy alternative. Abscesses, cavity or deep wounds need more honey to adequately penetrate deep into the wound tissues. The wound bed should be filled with honey before applying the honey dressing pad (Anand *et al.,* 2023).

Note that it causes minimal pain during application and removal and maintains the wound bed upon removal thereby preserving the newly forming granulation tissue, studies have also shown high patient acceptability to honey therapy due to the favourable effects observed in practice, decreased pain, reduced wound size, deodorizing effect etc. All of the aforementioned experiments, research and innovations as well as clinical utilization, highlight the increasing interests and confidence in heavy as an effective remedy for burn wound and other wound care (Anand *et al.,* 2023).

Antibacterial activity

Honey has been demonstrated in many studies to have antibacterial effects. The antibacterial activity of honey is attributed both to physical factors: acidity osmolarity, and chemical factors: hydrogen peroxide, volatile, beeswax, nectar, pollen and propolis. Honey is a concentrated

solutions of monosaccharide sugars leading to lygroscopicity of honey with low water activity. When honey concentrate is applied to micro-organisms, it poses antimicrobial effect through its osmotic property (Ayse & Dilek, 2020).

Antioxidant capacity

The generation of reactive oxygen species (ROS) and other free radicals during metabolism is an essential and normal process that ideally is compensated through the antioxidant system. However, due to many environmental, lifestyle, and pathological situations, free radicals and oxidants can be produced in excess, resulting in oxidative damage of biomolecules (e.g., lipids, proteins, and DNA). This plays a major role in the development of chronic and degenerative illness such as cancer, autoimmune disorders, aging, cataract, rheumatoid arthritis, cardiovascular, and neurodegenerative diseases. The human body has several mechanisms to counteract oxidative stress by producing antioxidants, which are either naturally synthetized in situ, or externally supplied through foods, and/or supplements (Mashbari *et al.,* 2023).

Research indicates that foods rich in antioxidants such as honey can protect from the damaging effects of free radicals and ROS and thus exhibit beneficial effects on human health; such as cardiovascular protection by preventing ROS-induced tow density lipoprotein (LDL) oxidation; cell death in some cancer cell lines; enhance the human antioxidant defense system among others. For instance in animal models, honey showed a protective effect against damage and oxidative stress induced by cigarette smoke in rat testis; honey supplementation exhibited a hepatoprotective and nephroprotective effect in rats with experimental aflatoxicosis due to its antioxidant activity (Tang, Chen & Ran, 2024).

The antioxidant capacity (or antioxidant activity) of honey is commonly attributed to its phenolic compounds. These compounds exhibit several preventive effects against different diseases like

cancer, cardiovascular diseases, inflammatory disorders, neurological degeneration, wound healing, infectious diseases and aging. The main antioxidant phenolic compounds in honey are: (a) phenolic acids: gallic acid, caffeic, ellagic, ferulic and p-coumaric acids, syringic acid, benzoic acid, cinnamic acid; chlorogenic acid, and (b) flavonoids: apigenin, chrysin, galangin, hesperetin, kaempferol, pinocembrin and quercetin. While some of these bioactive compounds are found in most honey samples; others Such as hesperetin and naringeninare found in few honey varieties (Anand *et al.,* 2023).

Gastroenterology

Honey is reported to have effects of preventing and treating gastrointestinal disorders such as peptic ulcers, gastritis, and gastroenteritis. Honey is a potent inhibitor of the causing agent of peptic ulcers and gastritis, helicobacter pylori. Honey is natural and will not raise blood-sugar levels; a mix of honey and water is a good cure for colic (Tang, Chen & Ran, 2024).

Honey has prebiotic effects; increasing the population of bacterial microflora important for the health of gastrointestinal tract. According to Mashbari *et al.,* (2023), the consumption of honey increases the population of normal flora called bifidobacteria, where its constitutents were found to pose prebiotic effect that resembles the effect of fructooligosaccharides (FOS) (Tang, Chen & Ran, 2024).

Anti-inflammation action

Honey reduces the activities of cyclooxygenase-l and cyclooxygenasc-2, thus showing antiinflammatory effects and demonstrates immuno-modulatory activities. Furthermore, ingestion of diluted natural honey showed reduction, effect on concentration of prostaglandins such as prostaglandins E2, prostaglandins F2x and thromboxane B2 in plasma of normal individual. Some

authors also have proved that anti-inflammatory activity of honey was as effective as prednisolone, reference drug. Further, honey has an anti-inflammatory action free from adverse side effect such as suppression of immune response and tissue growth, formation of ulcers in stomach, etc (Tang, Chen & Ran, 2024).

2.1.3 Honey and its mechanisms of action

Numerous research have examined the molecular effects behind the different protective activities of natural honey, leading to a number of likely hypotheses. These include the processes that are thought to be in charge of natural honey's anti-microbial, anti-inflammatory, anti-diabetic, gastro, hepato-, and cardio-protective properties as well as its anti-cancer potential. The following are some of the phenomena that honey's antibacterial activity involves: First, honey dehydrates potentially infectious organisms by drawing water from the environment. Therefore, this one-time action of honey makes little to no water available to support the growth of bacteria and yeast. (Mashbari *et al.,* 2023).

This hygroscopic action of honey, coupled with its high- sugar content, hinders the growth of bacteria and other microbes (Carlos *et al.,* 2022). Second, natural honey has a low pH, which confers high natural acidity on honey to inhibit some pathogens.

In addition, the production of hydrogen peroxide by glucose oxidase, an enzymatic constituent of honey, contributes to its antibacterial activity. The non-peroxide components of honey, such as the phytochemicals, oligosaccharides, organic acids, lysozyme, organic acids and other bioactive substances, also contribute to its mechanistic potential. These biochemical constituents are very important and helpful in the efficacy of honey as a broad-spectrum antibiotic and potent apitherapeutic agent (Carlos *et al.,* 2022).

The mechanisms of action of this natural product on diabetes and other metabolic diseases have

been attributed to its influence on metabolic and neuronal activities within the gastro-intestinal tract (GIT). Consumption of natural honey sensitizes the sensory nerves in the GIT, causing proprioception as a result of capsaicin. This mechanism entails some processes, such as ulcer index reduction, permeability of blood vessels in the GIT, and enhanced muscular activity of the stomach. The processes have been further explained by other authors through the documentation of the effect of dandelion honey consumption in ameliorating the ill effects of acidity in the stomach by about 50% (Carlos *et al.,* 2022).

According to other studies, honey slows down the rate at which sugars travel through the gastrointestinal tract after consuming natural honey, as opposed to the rate that occurs after consuming a glucose/fructose mixture. This lessens the negative consequences of diarrhea and helps diabetes people by reducing ulcerative effects. The observed benefits of using honey medicinally to treat bacterial diarrhea in infants and children can be explained by this mechanism. In a similar vein, natural honey, in contrast to the outcomes of conventional medication, decreases the etiology and duration of viral diarrhea (Malik *et al.,* 2020). Thus, natural honey is an excellent anti-diabetic, anti-diarrhoeal and anti-microbial agent.

Most of the protective and mechanistic effects of honey emanate from the antioxidant constituents of natural honey. Natural honey enhances the non-protein sulfhydryl antioxidant capacity to ameliorate ethanol-induced ulcer lesions in rodents. Further establishment of the mechanism of honey as a chemotherapeutic agent was obtained by monitoring the concentration of endogenous antioxidant glutathione in N-ethylmaleimide (NEM)-damaged liver of animal models pretreated with Anzer honey. The results showed a reduction in the antioxidant concentration in proportion to the level of the damage, thereby confirming the importance of endogenous glutathione, enhanced by the antioxidant constituent of honey, as a gastro- and hepatoprotective agent. The

epatoprotcection was suggested to be mediated through some processes of the non-protein sensory substance, sulfhydryl antioxidant (Cooper, Molan, & Harding, 2023).

2.1.5 Factors that may limit honey utilization

Factors that may limit honey utilization are Type 2 diabetes, people who have weakened immune system, hypotension and honey intoxication. Honey may be detrimental for patients with type 2 diabetes because of the great quantities of sugars it contains. Honey has complex B vitamins that favour the nervous system, energy production and nails, hairs and skin virtually: but just as many types of fruit, honey is rich in simple sugar, therefore is not advisable to those who live with diabetes, since it could be detrimental for their health. People who have a weakened immune system should not eat honey because of risk of bacterial or fungi infection (Tang, Chen & Ran, 2024).

Honey intoxication, a kind of poisoning, can be seen in the black sea region of turkey and in various other parts of the world as well. In the study sixty six (66) patients were hospitalized with a variety of symptoms including nausea, vomiting, salivation, dizziness, hypotension, weakness, bradycardia and syncope several hours after the ingestion of amounts of honey. All patients had hypotension, and bradycardia. Honey poisoning should be taken into consideration in the differential diagnosis of acute myocardial infection and in the patient with vomiting hypotension and bradycardia (Moore *et al.,* 2021).

2.2 Theoretical Review

The model that best relate to this research study is levine's conservation model. This model was propounded by Levine (1967). The Levine (1967) conservation model describes how adaptation leads to the wholeness of an individual through the conservation of energy, social integrity, structural integrity, personal integrity.

According to Levine, nursing is a science that excels in the skill of human interaction and is a partnership of the human experience with the patient. During this relationship, the nurse uses the scientific process to interpret the patient's altered health status and organismic response to develop a nursing judgment or trophicognosis. He used four principles to describe wound management. To clarify the relationship between levine's conservation model and wound management, each of the four principles will be examined.

These principles include:

- Conservation of energy
- Conservation of structural integrity.
- Conservation of personal integrity.
- Conservation of social integrity.

Conservation of energy: of an abstract concept that relieves on free exchange between the internal and external environment A person's energy conserved if a balanced of energy input and output is achieved.

Conservation of structural integrity: Is the task of keeping the person whole (Levine,1967). Behaviours such as hygiene, health providers visits and medicines are examples by which structural integrity is maintain.

Conservation of personal integrity: This includes respect, self-awareness, humanness, selfhood and self-determination.

Conservation of social integrity: Refers to the patient's role in the community, family, ethnic group, culture and religion.

Application of theory

Conservation of Energy: Patient with burns do experience so much pain especially during wound dressing which result to restlessness, sleeplessness, aggression hostility and all these consume patients energy. One of the major problems of burn injury is hyper catabolism leading to excessive weight loss and fatigue and when the body system is disturbed, energy is utilized. To reduce and fatigue, weight loss, pain, patient's energy has to be conserved.

Patient's activity is dependent on energy balance and wound infected injury increases energy demand also that increased energy demand can be measured by the level of fatigue patient exhibit. Therefore, even the most basic nursing procedures including wound dressing rest and adequate rest and adequate nutrition utilize the principle of conserving energy. To maintain life activities, energy levels need to be balanced and constantly renewed. Nurses often are the people in contact with burn patients in who pain healing and aging challenge the ability to conserve energy. Therefore, nurses not only help conserve energy through a reduction in frequency of wound dressing activities, but they also ensure energy expenditure remains within the individual's capability safety and comfort.

Inflammation and immune system utilize energy in order to restore homeostasis and promote healing. Processes of wound healing also utilizes energy, therefore, nurses should use any of the modern wound treatment dressing method that restore skin integrity and minimize energy expenditure and this ultimately result in earlier discharge, reduced healthcare expenditure and loss

emotional trauma. However, in order to assess the energy conserving effect of wound treatment, energy can be measured in everyday nursing practice via body temperature, blood gas, pulse and blood pressure. Fluctuations determine either energy expenditure or conservation. Wound healing on other hand may be effective measure of energy conservation because of structural integrity cannot be maintained without conserving energy.

Conservation of structural Integrity: Change in body structure of burns patient ultimately affect their function. This structural integrity is compromised by burn pathophysiological processes, healing and repair, restores continuity and form through cell replication. Therefore, proper wound management encourages healing, reduces tissue destruction and burn injury complications like contractures and conservation structural integrity include anatomic position and range of motion exercise during and after wound dressing to prevent musculoskeletal deformities, pressure area care to prevent pressure ulcers and early mobilization and chest physiotherapy to prevent complication of bed rest. Though this conservation of structural integrity, a burn patient can feel intact, whole and subsequently manifest in improvement in self-identity.

Conservation of personal integrity: In burn injury, prolonged hospitalization and high cost of treatment and depression usually compromises the patient personal integrity, self-identity and selfrespect. Nursing intervention should aim at conserving personal integrity by protecting and respecting patients privacy, possessions and defense mechanism and nurses should support patients personal choice. In the case of wound care, intact skin integrity, dependence on other individuals is almost certain. Therefore, interventions that hasten burn injury healing and ultimately shorten hospital duration. Effective wound management and dressing materials economy also may restore patient self-worth and personal integrity.

Conservation of social integrity: Burn patient usually exhibits social withdrawal or social

isolation such as inability to relate to various social group and families due to change in body structural appearance, Immobility, financial difficulty and prosthetic embracement. Social factors such as family, friends, culture, religion, education and socio-economic status all determine how an individual defines himself, thus a loss of these factors (e.g. work, income or family) may weaken an individual social interaction should include, providing family support and education promoting family participation in care and fostering patient interaction with others, facilitating wound healing. Effective wound management may inadvertently reduce health care expenditure and demand on health care services.

2.3 Review of Empirical Studies The level of utilization of honey

This unit discusses previous related works that have been carried out in the study area which are relevant to the study.

Jan *et al.,* (2021) conducted a study on the knowledge, attitudes, and practices regarding wound care among general population in Aseer region. This cross-sectional study was a questionnaire-based study conducted on general population from time period from September 2020 to November 2020. A total of 897 participants were included in the study. In total, 56.74% subjects of age group 41–60 years of age. In around 80% participants, no co-morbidities were observed. Around 29% participants had previous experience of surgical wound, with most common wound site being abdomen. The most common symptom in around 58% participants was excessive bleeding. Use of Alcohol swab and dry gauze were commonly used by participants as wound care measures.

Fernández-Araque *et al.,* (2024) conducted a study on the assessment of nurses' level of knowledge of the management of chronic wounds. Cross-sectional study of a health system of 95,000 inhabitants and 557 nursing professionals were used for this study. Survey results described a low

knowledge of chronic wound management in general. Data on knowledge according to area of work showed that nurses in primary care had the highest knowledge of wound etiology. Nurses working in health and social care were most knowledgeable in diagnostic knowledge. Hospital nurses showed the lowest knowledge overall. A relationship was observed when nurses had a master's degree followed by an expert with better knowledge in the test. In addition, nurses reported little training in chronic wounds during their university studies (69.73 %, n = 106).

Another study by Mashbari *et al.,* (2023) on Knowledge, attitude and practices towards surgical wound care and healing among the public in the Jazan Region, Saudi Arabia. An online selfadministered questionnaire was used in the collection of data. Simple random sampling was the used technique and 384 participants were calculated. The study used Statistical Package for the Social Sciences (SPSS) for data analysis and employed descriptive statistics, independent t test, Analysis of Variance (ANOVA), Pearson's correlation, and multivariate logistic regression to identify factors associated with knowledge of surgical site infection and wound care. While participants had a strong general understanding of surgical wounds, only 17% had a high degree of knowledge about surgical site infection and wound management. Medical students had the highest degree of knowledge, and being a medical student was the only significant predictor of having a high level of knowledge about surgical site infection (SSI) and wound care. The study emphasizes the necessity of enhanced patient education and investment in medical education quality.

Beáta, Lucia, Kvetoslava, Rimárová & Jarmila, (2025) carried out a research on Nurses' motivation, attitudes and knowledge in wound care. An exploratory cross-sectional study. Ninetyfour randomly selected nurses who work with patients with wounds on a daily basis participated in this study. The instrument constructed by authors was distributed from February to

March 2022. The overall motivation reached 73%, attitude 53% and knowledge 54%. There was a significant difference found in motivation between departments/settings (P = 0.036) with the highest level achieved by home care nurses, a positive correlation between knowledge and level of education (P = 0.042), and positive attitudes in the group of nurses with specialization (P = 0.021). Nurses are interested in further education, but they lack competences.

Obilor, Omolara & Ani, (2021) conducted a research on a survey of nurses' wound assessment knowledge, attitude and competence in Nigeria. A total of 182 nurses working in the hospital's medical, surgical and neuroscience units participated in the study. Participants' attitudes were structured in a four-point Likert scale format (strongly agree, agree, disagree and strongly disagree), with the expected score ranging from 10–40. More than half of the nurses demonstrated a high level of knowledge (n=96, 52.7%) in wound assessment overall, except in wound aetiology, wound size measurement, undermining and wound bed tissues. Also, 51.1% of the nurses had a positive attitude (n=93) and low competence (n=171, 94%) in wound assessment. Wound assessment was mostly perceived as physicians' responsibility and not that of nurses. There was no significant association between nurses' competence and knowledge (χ^2=0.24, p=0.81) and their attitude to wound assessment (χ^2=0.15, p=0.73).

Level of clinical effectiveness of medical honey

Yilmaz & Aygin, (2020) conducted a systematic review on honey dressing in wound treatment. Seven hundred and twenty three (723) relevant publications were reached. After the evaluation, 30 studies were examined. Thirty (30) publications which were obtained as a result of the scans in the databases and which comply with the evaluation criteria were included in the review. In the results of the study, it was generally reported that honey in acute and chronic wounds provided rapid

epithelization and wound contraction in wound healing, had anti-inflammatory and debridement effect, decreased the pain, ensured infection control, shortened the time of wound healing and was cost-effective. Osman, Umar, Hashmi, Jawaid, & Ahmed, (2022) carried out a system review on the efficacy of honey compared to silver sulfadiazine for burn wound dressing in superficial and partial thickness burns. Seven studies were identified: totaling a population of 582 patients. The systematic review and meta-analysis were performed using the PubMed, MEDLINE and Embase databases to find relevant randomized control trials (RCTs) for inclusion. The outcomes measures included complete burn wound healing time, the proportion of wounds rendered sterile and subjective pain relief associated with the respective dressing type. Quality and risk of bias assessments were performed using the Cochrane RoB2 tool. From three studies, meta-analysis showed no significant difference in complete wound healing time ($p = 0.06$). Meta-analysis from five studies highlighted an overall significant difference favouring honey dressing in the proportion of wounds rendered sterile at day 7 post-injury (OR 10.80; 95% CI [5.76, 20.26]; $p < 0.00001$; $I2 = 88\%$). We conclude that honey dressings may be as or more effective than SSD in the treatment of superficial and partial thickness burn injuries.

Yukari *et al.,* (2020) conducted a research on evaluation of the effects of honey on acute-phase deep burn wounds. Two deep burn wounds were created on mice which were divided into four groups: no treatment, silver sulfadiazine, manuka honey, and Japanese acacia honey. Wound sizes were calculated as expanded wound areas and sampled 30 minutes and 1–4 days after wounding for histological observation. The wound sections were subjected to hematoxylin and eosin and immunohistological staining to detect necrotic cells, apoptotic cells, neutrophils, and macrophages. Data were expressed as mean ± SD and were analyzed using JMP 8.0.1 (SAS, USA) (ANOVA, multiple comparison Tukey-Kramer). Differences were considered significant at $P <$

0.05. The no treatment group formed a scar. The redness around the wound edges in the silver sulfadiazine group was the most intense. All groups exhibited increased wound areas after wounding. The proportions of necrotic cells and the numbers of neutrophils in the manuka and acacia honey groups were lower than those in the no treatment and silver sulfadiazine groups until day 3; however, there were no significant differences between all groups on day 4. These results show that honey treatment on deep burn wounds cannot prevent wound progression. Moreover, comparing our observations with those of Jackson, there are some differences between humans and animals in this regard, and the zone of hyperemia and its surrounding area fall into necrosis, which contributes to burn wound progression.

Liche, Zulu, Kasongo & Munthal, (2023) conducted a research on the effects of silver sulfadiazine and actilite® honey on bacteria wound colonization and wound healing in children with partial superficial burn wounds at University Teaching Hospital, Lusaka, Zambia. This two-arm open label randomized trial was done at UTH over a period of seven months (July 2017-January, 2018). Children under twelve years with£20% partial superficial burn wounds were recruited. Simple randomization was used to allocate patients to either honey or SSD group. Patients' clinical characteristics were noted on recruitment. Swabs for microbiological evaluation were collected on day 0, 3, 7 and 10 and wounds were assessed for healing. approved the research. Of the 64 patients, 32 were allocated to each group. The modal age distribution was 1-2 years and the percentage burn wound surface area was 6-10 percent in both age groups. At baseline there was no significant association between the two treatment methods and bacterial wound colonization (80% in honey group and 83% in SSD group; $p = 0.74$) using Chi-squared test. However, by day 10 on treatment, there was significant reduction in bacterial wound colonization (Honey Vs SSD; $P = 0.026$). Using Student T-test it was found that wounds treated with Actilite® honey healed quicker than those

treated with SSD (Mean 11± 4, 15±6, P=0.0049).

Malik, Malik & Aslam, (2020) conducted a study on honey compared with silver sulphadiazine in partial-thickness burns. In this randomized comparative clinical trial, carried out Burn Center of POF Hospital, Wah Cantt, Pakistan, from May 2007 to February 2008, 150 patients of all ages having similar types of superficial and partial-thickness burns at two sites on different parts of body were included. Each patient had one burn site treated with honey and one treated with topical SSD, randomly. Student t-test and analysis of variance test were used to compare the study groups, wound size and healing time. Significance level was determined as less than 0·05. he rate of reepithelialization and healing of superficial and partial-thickness burns was significantly faster in the sites treated with honey than in the sites treated with SSD (13·47 ± 4·06 versus 15·62 ± 4·40 days, respectively: $P < 0·0001$). The site treated with honey healed completely in less than 21 days versus 24 days for the site treated with SSD. Six patients had positive culture for Pseudomonas aeroginsa in honey-treated site, whereas 27 patients had positive culture in SSD-treated site. The results clearly showed greater efficacy of honey over SSD cream for treating superficial and partial-thickness burns.

Factors influencing the use of honey

Nshimyiyera, (2020) made a research on the assessment of wound dressing practices among nurses, general practitioners and surgeons in Rwanda. This was a cross-sectional KAP (knowledge, attitude and practice) study carried out in three hospitals: University Teaching Hospital of Kigali (CHUK), Kibungo Referral Hospital and Kibogora District Hospital in June 2020. Surgeons, general practitioners (GPs) and nurses working in surgical departments of the three hospitals have been included. A pre-established questionnaire investigating knowledge, attitude and practices about wound dressing has been administered after informed consent. Stata statistical software

(version 13.0, StataCorp, College Station, TX) was used for analysis. Frequencies and percentages for categorical variables and medians and interquartile range for continuous variables were reported. Associations have been assessed using the Chi-square test. For the data that met the assumptions of the parametric tests, differences in the means were calculated using t-tests. The median knowledge score was 6.65 points out of 13 (IQR 4.5-8.3 points). We found that only 5.1% scored high (>80%), 46.94% scored medium (51-80%), and 47.96% scored low (</=50%) in knowledge about wound dressing. The difference in knowledge was statistically significant when comparing surgeons and nurses (3.12±0.65, p=.000). However, there was no statistically significant difference found between the GP and nurse groups (1.13±0.56, p=.114). Concerning attitudes towards wound dressing, 83.67% considered locally made gauze dressing as good enough to prevent surgical site infection (SSI). 23.47% were not comfortable to leave primarily closed wounds undressed fearing the risk of SSI. However, there was no significant difference noticed in different health professionals' groups. 78.57% use locallyx made gauze dressings always. The choice of dressing to use was based only on availability in 54%.

Bahari, N.; Hashim, N.; Md Akim, A.; Maringgal, (2022) carried out a review on the recent advances in honey-based nanoparticles for wound dressing. Interviews were conducted with 20 multi-disciplinary participants from nursing, surgery, infection control and wound care who worked at a metropolitan hospital in Australia. Data were collected during 2021–2022. Constant comparative analysis underpinned by Strauss and Corbin's framework was used to identify clinical decision-making processes. The core category was 'balancing practice-based knowledge with evidence-based knowledge'. Participants' clinical practice and actions embedded the following processes: 'utilizing the best available information', 'using a consistent approach in wound assessment' and 'using a multidisciplinary approach'. The substantive theory explains how

practice and evidence knowledge was balanced and the variation in use of intuitive practice-based knowledge versus evidence-based knowledge. Participants considered patients' needs and preferences, costs, outcomes, technologies, others' expertise and established practices. Participants' decision-making tended to be more heavily weighted towards intuitive practice-based processes.

Molan, (2022) carried out a research on the evidence and the rationale for the use of honey as a wound dressing. This review outlines the 16 randomized controlled trials (RCTs) of honey in wound care published since Molan reviewed the previous 17 in 2006, which bring the total of participants in the trials up from 1,965 to 3,556 and broadens the range of types of wounds on which trials with honey have been conducted. Another important factor influencing the choice by clinicians of which product to use on a wound is scientific rationale.

According to a research work done by Mashbari *et al.,* (2023) on biological and therapeutic effect of honey produced by honey bees and stingless bees. The general population was the subject of this questionnaire-based, cross-sectional study, which was carried out between January and November of 2022. The study involved 626 participants in all. The main factors that can influence the use of honey are cost (70%), availability (85%), not accepted by institute (23%), accessibility (56%).

Summary

Honey is a tropical antibacterial agent for treatment of infected wound. It contains carbohydrate, proteins, antioxidant and organic acid. All these properties makes it to be bactericidal, fungicidal and helps to accelerate wound healing and that is why honey is mostly used when conventional antibacterial treatment with antibiotics and antiseptics are ineffective. Numerous studies have shown that those difficult-to-heal wounds respond well to honey dressings. Inflammation, swelling

and pain rapidly subside, unpleasant odour stop, debridement is enhanced as the honey dressing remove dead tissue painlessly and continue damage to the re-growing cell. Honey promotes rapid healing with minimal scarring in the treatment of wound. The advantage of honey cannot be over emphasized and that is why it is advocate in the treatment of burns, abscesses, ulcers and infected wound resulting from injury or surgery.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter gives a detailed description of the procedure to be used in research methodology of this study. The study was discussed under the following sub headings: research design, research setting, target population, sampling technique, instrument for data collection, validity of instrument, reliability of instrument, method of data collection, method of data collection and ethical consideration for the study.

3.1 Research Design

The design that was adopted for the study is the descriptive survey which aims at finding out the utilization and perceived effectiveness of honey in wound management in the past four decades and the utilization of honey by qualified nurses in University of Benin Teaching Hospital, Benin City, Edo State.

3.2 Research Setting

The research was conducted at the University of Benin Teaching Hospital (UBTH), located in Ugbowo, Benin City, Edo State, Nigeria. Established on May 12, 1973, pursuant to Edict No. 12 of the Nigerian National Health Act, UBTH is situated to the north of Oluku, south of Uselu, east of Ehor, and west of Iguobazura. UBTH is one of the leading tertiary healthcare institutions in the country, offering comprehensive medical services to a wide range of patients, including those with chronic conditions such as diabetes mellitus. This hospital is particularly well-suited for the study, as it has a dedicated diabetes management unit that provides both outpatient and inpatient services to diabetic patients. The unit specializes in educating patients on insulin self-administration and diabetes management, making it an ideal setting for assessing adherence to insulin therapy (Adeolu and Esin, 2023). The hospital serves a diverse population from both urban and rural areas of Edo

State. This diversity provided a representative sample of diabetic patients, offering insight into various factors that may influence adherence to insulin self-administration. The strategic location of UBTH in a metropolitan area like Benin City also makes it easily accessible to a large number of patients, ensuring a robust sample size for the research. UBTH currently manages a patient population of approximately 3,450 across all wards.

3.3 Target Population

The target population comprises of 721 nurses working in the various departments in University of Benin Teaching Hospital, Ugbowo, Benin City.

Table 3.1: Number of Nurses in clinical areas

UNITS	NUMBER OF NURSES
Accident and Emergency Unit A	88
Accident and Emergency Unit A	76
Surgical Unit	92
Obstetrics and Gynecology	90
Medicine Unit A	82
Medicine Unit B	69
Theatre Compex	73
Pediatrics	73
Clinic Unit A	45
Clinic Unit B	33
Total	721

(Source, Human Recourses Department, February, 2025)

3.4 Sample Size Determination

The sample size was obtained, using the Taro Yamane simplified formula for calculating sample size of finite population as described by Israel (2013).

Sample size (n) =

$$\frac{N}{1 + N\ (e)^2}$$

N = population size (170) e

= level of precision (5%)

$$\frac{n = 721}{1 + 720\ (0.05)^2} = 257.5$$

Based on this calculation, the researcher will select two hundred and fifty-seven nurses for the study.

3.5 Sampling Techniques

The sampling technique employed for this study is convenience sampling, also known as haphazard or accidental sampling. This sampling technique is particularly appropriate for this study because the researcher will have easy access to nurses from various wards in the hospital. The method allows for efficient data collection within a limited timeframe and with available resources (Smith *et al.,* 2022).

3.6 Instrument for Data Collection

A structured, interviewer-administered questionnaire was developed by the researcher as a tool for data collection. The questionnaire contained four sections A, D, C and D section's.

Section A contained personal data of the respondent which is demographic data while Section B,

C and D contained questions that were structured according to objectives of the study. The respondents were asked to tick in the spaces providing the appropriate answers. The questionnaire was presented to the project supervisor for validation and following the amendment, it was corrected and distributed to the respondents by the researcher.

3.7 Validity of the Instrument

Validity is about the accuracy of a measure. The self-structured questionnaire was given to the supervisor who made necessary corrections before producing the final copies of the questionnaire.

3.8 Reliability of Instrument

Reliability was established by retesting the questionnaire on the same group of nurses in Edo state central hospital.

3.9 Method of Data Collection

An introductory letter endorsed by the Head of Nursing Science department was submitted to the Ethical Research Committee, University of Benin Teaching Hospital, (UBTH) for permission to allow the researcher collect the information needed for her research work from the nurses. The data was collected through the use of questionnaire which the researcher delivered by hand to the nurses on each shift and was collected at the spot after detailed explanation of what the study entails.

3.10 Method of Data Analysis

The data collected was analyzed in line with research objective formulated using frequency and percentages and four point modified likert type scale. The aptitude questions was analyzed by calculating the mean score of each of item.

A- Agree

SA- Strongly Agree D-Disagree SD- Strongly disagree 4+3+2+1= 10/4= 2.5.

Explaining the above mean number, it shows that decision above 2.5 is positive attitude and mean score of below 2.5 is negative attitude.

3.11 Ethical Consideration

The objective of securing ethical approval is to ensure adherence to widely accepted scientific principles and international ethical standards governing research involving human subjects. Informed consent will be obtained from all participants, and confidentiality of the collected data will be assured. An introductory letter was issued by the Department of Nursing Sciences, University of Benin, facilitating the research process. To maintain participant anonymity, personal identifiers such as names was not collected.

1. **Autonomy**: Autonomy encompasses an individual's right to make informed and voluntary decisions regarding their participation in research. Upholding autonomy requires researchers to obtain informed consent, ensuring participants fully understand the study's purpose, methods,

potential risks, and benefits. Participants were afforded the opportunity to ask questions and voluntarily consent to participate without any form of coercion or undue pressure. Key components of autonomy in research include:

- **Informed Consent**: Participants were provided with comprehensive information about the study to facilitate an informed decision.
- **Voluntary Participation**: Participants retained the right to decline or withdraw from the study at any stage without facing any repercussions.
- **Capacity**: Researchers ensured that participants possessed the cognitive and emotional ability to make autonomous decisions regarding their participation.

2. Confidentiality: Confidentiality pertains to the protection of participants' personal and sensitive information. Researchers have an ethical obligation to protect participants' privacy by ensuring that data is collected, stored, and reported in a manner that prevents the identification of individual participants. Maintaining confidentiality fosters trust between researchers and participants, promoting candid and accurate responses. Key aspects of confidentiality include:

- **Data Protection**: Researchers must implement robust measures to secure data, such as encryption and secure storage solutions.
- **Anonymity**: Whenever possible, researchers should anonymized data to ensure that participants' identities are not discernible from their responses.
- **Limited Access**: Access to participants' data was restricted to authorized personnel only.

Reporting: In reporting findings, data were aggregated to avoid the identification of individual participants.

CHAPTER FOUR

RESULTS

This chapter deals with the representation of data collected regarding the utilization and effectiveness of honey in wound management by nurses in University of Benin Teaching Hospital. A total of 258 questionnaires were distributed to nurses working in the various departments in University of Benin Teaching Hospital, 249 were properly filled and valid for data analysis, giving a response rate of 96.5%.

Table 4.1: Socio-demographic characteristics of respondents

Variable	Frequency (n = 249)	Percent (%)
Age		
18–25 years	36	14.5
26–35 years	99	39.8
36–49 years	85	34.1
Above 50 years	29	11.6
Gender (Sex) Male		
	87	34.9
Female	162	65.1
Marital Status		
Single	103	41.4
Married	146	58.6
Religion		
Christianity	171	68.7
Islam	67	26.9
Others (e.g. Traditional)	11	4.4
Years of Experience 1–5		
years	61	24.5
6–10 years	93	37.3
11–15 years	66	26.5
Above 15 years	29	11.6

Table 4.1 presents the socio-demographic characteristics of the 249 respondents. The majority (39.8%) were between the ages of 26 and 35 years, followed by 34.1% aged 36 to 49 years, while 14.5% were aged 18 to 25 years, and 11.6% were above 50 years. Most respondents were female (65.1%), while males accounted for 34.9%. In terms of marital status, 58.6% were married, and 41.4% were single. Christianity was the predominant religion (68.7%), followed by Islam (26.9%), with 4.4% identifying with other religions such as traditional beliefs. Regarding years of experience, 37.3% had 6 to 10 years of experience, 26.5% had 11 to 15 years, 24.5% had 1 to 5 years, and 11.6% had more than 15 years.

Answering Research Questions

Research Question 1: What is the level of utilization of honey by the nurses in the management of burns wounds?

Table 4.2: Utilization of honey in wound management by nurses

Statement	Always	Often	Rarely	Never	Mean	Remark
use honey as a primary dressing for burn wounds.	65 (26.1)	77 (30.9)	66 (26.5)	41 (16.5)	2.7	High
recommend honey for burn wound treatment when other options are available.	62 (24.9)	71 (28.5)	68 (27.3)	48 (19.3)	2.6	High
initiate the use of honey without waiting for a doctor's directive.	78 (31.3)	77 (30.9)	58 (23.3)	36 (14.5)	2.8	High
have used honey in combination with other wound care products for burns.	52 (20.9)	79 (31.7)	65 (26.1)	53 (21.3)	2.5	High
apply honey to burn wounds when standard wound care materials are unavailable.	57 (22.9)	74 (29.7)	61 (24.5)	57 (22.9)	2.5	High
have received training on how to use honey for burn wound management.	44 (17.7)	62 (24.9)	69 (27.7)	74 (29.7)	2.3	Low
discuss the benefits of honey with patients or caregivers during wound care.	51 (20.5)	78 (31.3)	63 (25.3)	57 (22.9)	2.5	High
follow protocols or guidelines that include honey for managing burn wounds.	47 (18.9)	73 (29.3)	61 (24.5)	68 (27.3)	2.4	Low
keep honey readily available as part of my wound care supplies.	74 (29.7)	69 (27.7)	64 (25.7)	42 (16.9)	2.7	High
prefer using honey over conventional dressings for minor burn injuries.	66 (26.5)	68 (27.3)	66 (26.5)	49 (19.7)	2.6	High
Grand Mean					**2.6**	**High**

Mean Cut-off = 2.5

Table 4.2 shows that the highest mean score (2.8) was recorded for initiating the use of honey without waiting for a doctor's directive. This was followed by using honey as a primary dressing for burn wounds and keeping honey readily available as part of wound care supplies, both with a mean of 2.7. Recommending honey for burn wound treatment when other options are available and preferring honey over conventional dressings for minor burn injuries each had a mean of 2.6. Using honey in combination with other wound care products, applying honey when standard materials are unavailable, and discussing the benefits of honey with patients or caregivers all had a mean of 2.5. Following protocols or guidelines that include honey recorded a mean of 2.4, while receiving training on honey use for burn wound management had the lowest mean of 2.3. The grand mean was 2.6, indicating a generally high level of honey utilization in burn wound managemen

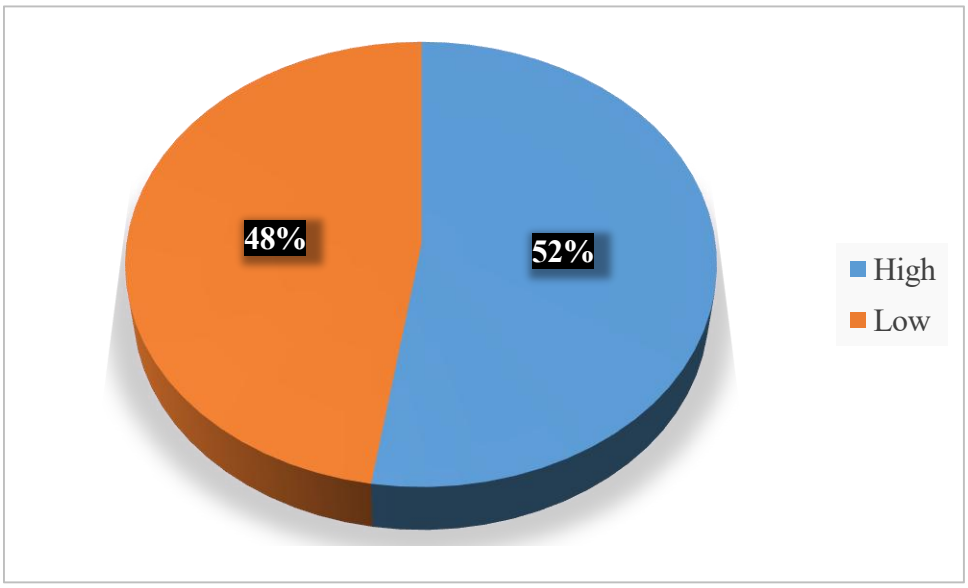

Figure 4.1: Bar chart showing utilization of honey in wound management by nurses

Figure 4.1 shows that 132 nurses (53%) reported high utilization of honey in wound management, while 117 nurses (48%) reported low utilization.

Research Question 2: What is the level of clinical effectiveness of medical honey for the management of wounds?

Table 4.3: Perceived clinical effectiveness of honey in wound management by nurses

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Remark
Honey promotes faster healing of wounds compared to conventional dressings.	69 (27.7)	84 (33.7)	56 (22.5)	40 (16.1)	2.7	High
Honey reduces wound infection effectively.	74 (29.7)	82 (32.9)	53 (21.3)	40 (16.1)	2.8	High
Honey helps in reducing wound pain and inflammation.	63 (25.3)	79 (31.7)	58 (23.3)	49 (19.7)	2.6	High
Wounds treated with honey show better tissue regeneration.	61 (24.5)	76 (30.5)	61 (24.5)	51 (20.5)	2.6	High
Honey has antibacterial properties that support wound healing.	72 (28.9)	87 (34.9)	53 (21.3)	37 (14.9)	2.8	High
Honey is as effective as modern antiseptic agents in wound care.	58 (23.3)	77 (30.9)	60 (24.1)	54 (21.7)	2.6	High
Honey improves the moisture balance in wounds, which aids healing.	66 (26.5)	82 (32.9)	55 (22.1)	46 (18.5)	2.7	High
The use of honey in wound management minimizes scarring.	59 (23.7)	74 (29.7)	63 (25.3)	53 (21.3)	2.6	High
Patients respond positively to the use of honey in wound treatment.	64 (25.7)	81 (32.5)	59 (23.7)	45 (18.1)	2.7	High
In my clinical experience, honey is an effective option for m	68 (27.3)	83 (33.3)	54 (21.7)	44 (17.7)	2.7	High
Grand Mean					**2.7**	**High**

Mean Cut-off = 2.5

Table 4.3 shows that the highest mean score (2.8) was recorded for the statements that honey reduces wound infection effectively and that it has antibacterial properties that support wound healing. This was followed by a mean of 2.7 for the belief that honey promotes faster healing of wounds compared to conventional dressings, improves the moisture balance in wounds which aids healing, patients respond positively to the use of honey in wound treatment, and honey is an effective option for managing different wound types. Statements with a mean of 2.6 included honey helping in reducing wound pain and inflammation, wounds treated with honey showing better tissue regeneration, honey being as effective as modern antiseptic agents in wound care, and the use of honey minimizing scarring. The grand mean was 2.7, indicating a high perceived clinical effectiveness of honey in wound management by nurses.

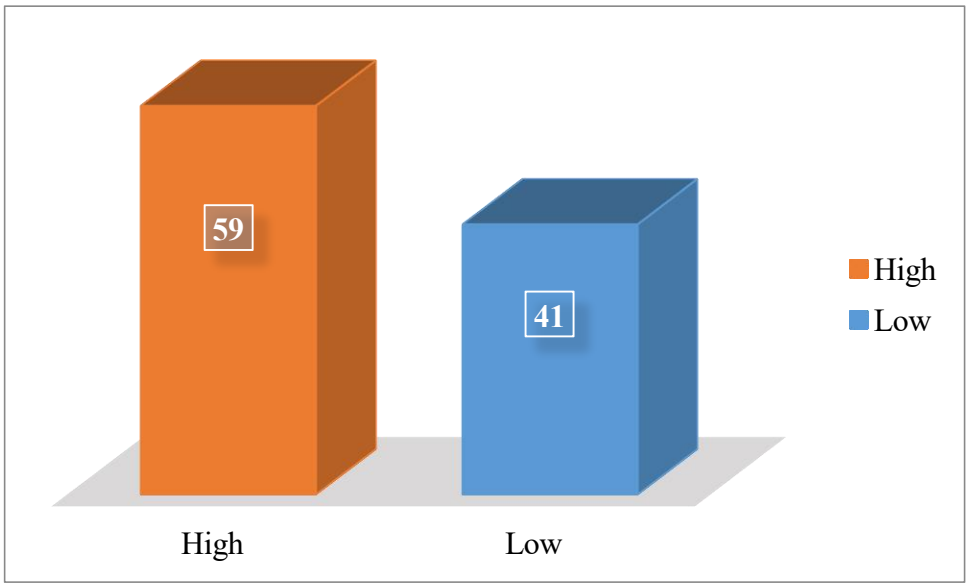

Figure 4.2: Bar chart showing perceived clinical effectiveness of honey in wound management by nurses

Figure 4.2 shows that 146 nurses (59%) perceived the clinical effectiveness of honey in wound management as high, while 103 nurses (41%) perceived it as low.

Research Question 3: What is the factors influencing honey utilization in the management of

Item	Agree	Strongly Agree	Disagree	Strongly Disagree	Mean	Remark
Availability of the honey	(29.7)	(32.5)	(22.5)	(15.3)	2.8	Influential
Not acceptable in the institution	(18.9)	(16.9)	(34.5)	(29.7)	2.2	Non-influential
Honey is very painful in wound dressing	(21.3)	(25.7)	(27.3)	(25.7)	2.4	Non-influential
Acceptability by the patient	(31.7)	(35.3)	(19.7)	(13.3)	2.9	Influential
Against my cultural belief	(14.5)	(10.8)	(36.5)	(38.2)	2	Non-influential
Inability to distinguish between original and fake	(26.9)	(33.3)	(22.1)	(17.7)	2.7	Influential
Not easily accessible	(28.5)	(30.9)	(23.3)	(17.3)	2.7	Influential
Cost of buying honey	(23.7)	(30.1)	(25.7)	(20.5)	2.6	Influential
Right type of honey	(24.9)	(34.5)	(24.5)	(16.1)	2.7	Influential
Challenges in the standardization of the bioactivities of honey		(31.3)	(25.3)	(16.9)	2.7	Influential

wound?

Grand Mean	**2.6**	**Influential**	

Mean Cut-off = 2.5

Table 4.4 shows that the highest mean score (2.9) was recorded for patient acceptability of honey in wound management. This was followed by availability of honey with a mean of 2.8. Inability to distinguish between original and fake honey, lack of easy accessibility, right type of honey, and challenges in standardizing the bioactivities of honey each recorded a mean of 2.7. The cost of

buying honey had a mean of 2.6. Statements such as honey being very painful in wound dressing and institutional unacceptability recorded mean scores of 2.4 and 2.2 respectively, while the lowest mean score (2.0) was recorded for the influence of cultural belief. The grand mean was 2.6, indicating that the factors listed were generally influential.

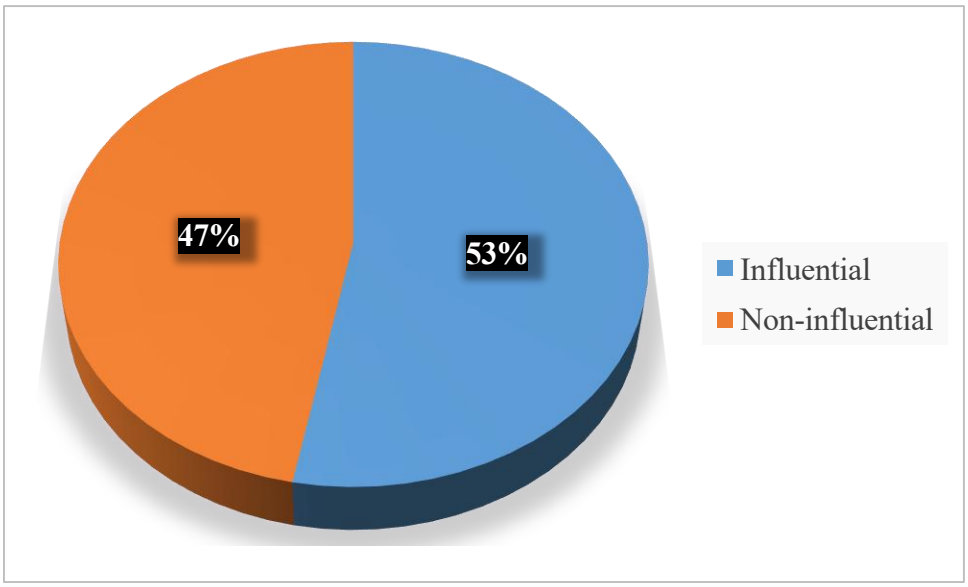

Figure.4.3: pie chart showing factors influencing the utilization of honey in wound management by nurses

Table 4.3 shows that 132 nurses (53%) identified the factors influencing the utilization of honey in wound management as influential, while 117 nurses (47%) considered them non-influential.

Hypothesis Testing

1. There is no relationship between use of honey by nurses in the management of burns wound and clinical effectiveness of honey for the management of wounds in University of Benin Teaching, Edo State**.**

Table 4.5: Relationship between use of honey by nurses in the management of burns wound and clinical effectiveness of honey for the management of wounds

Clinical Effectiveness	**Utilization**		**Test Statistics (χ^2)**	**df**	**P value**	**Decision**
	High	**Low**				
High	132 (53.4)	117(46.6)	2.041	1	0.002	Rejected
Low	146 (58.6)	103(43.4)				

Table 4.5 shows that there is a statistically significant relationship between the utilization of honey by nurses in the management of burn wounds and the perceived clinical effectiveness of honey, with a chi-square value of 2.041, 1 degree of freedom, and a p-value of 0.002. The null hypothesis was rejected.

CHAPTER FIVE

DISCUSSION AND FINDINGS

This chapter discusses the major findings of the research compared with the literature reviewed, the implication for nursing, summary, conclusion, Recommendations and Suggestions for further Studies.

5.1. Discussion of major Findings

The study assessed the utilization and effectiveness of honey in wound management by nurses in University of Benin Teaching Hospital. The socio-demographic profile of the respondents reveals important characteristics of the nursing workforce involved in wound management. The age distribution shows that the majority of nurses (73.9%) were between 26-49 years, with 39.8% aged 26-35 years and 34.1% aged 36-49 years. This age distribution aligns with Jan et al.'s (2021) study, though their study focused on the general population rather than healthcare providers, showing a different age concentration (56.74%) in the 41-60 years age group. Gender distribution indicates a predominance of female nurses (65.1%) compared to male nurses (34.9%). This gender disparity reflects the typical nursing workforce demographics observed in many studies, though it wasn't specifically highlighted in the reviewed literature as a factor influencing wound care practices. Regarding marital status, 58.6% of respondents were married while 41.4% were single. While this demographic aspect wasn't specifically addressed in the reviewed literature's findings, it provides context about the social characteristics of the nursing workforce. Professional experience distribution shows that the majority of nurses (63.8%) had 6-15 years of experience (37.3% with 6-10 years and 26.5% with 11-15 years). This finding can be contextualized with Beáta et al.'s (2025) study, which found that experience and specialized training significantly influenced wound care competency. It also relates to Fernández-Araque et al.'s (2024) findings that showed a

relationship between advanced education levels and better wound care knowledge. Religious distribution shows a predominance of Christianity (68.7%), followed by Islam (26.9%), and other beliefs (4.4%). While religious beliefs weren't explicitly discussed in the reviewed literature as influencing wound care practices, this demographic characteristic might relate to cultural acceptance of different treatment modalities, as suggested in Nshimyiyera's (2020) study on wound dressing practices. The years of experience distribution reveals that most nurses (63.8%) had between 6-15 years of experience, with only 11.6% having more than 15 years of experience. This experience profile can be compared to Obilor, Omolara & Ani's (2021) findings, which showed variations in wound care competency based on professional experience, though their study didn't find significant associations between experience and wound assessment knowledge. These demographic characteristics provide important context for understanding the study population and interpreting the findings regarding honey utilization in wound care. The predominance of experienced, middle-aged professionals suggests a workforce well-positioned to evaluate and implement evidence-based wound care practices, though the reviewed literature indicates that experience alone doesn't guarantee optimal wound care knowledge and practices. This demographic profile helps in understanding the characteristics of the nursing workforce involved in wound care and can inform targeted interventions for improving honey utilization in wound management, considering the specific needs and characteristics of different demographic groups within the nursing profession.

Use of honey by nurses in the management of burns wound

The findings from this study reveal that nurses demonstrate a generally high level of utilization of honey in wound management, with 53% reporting high utilization compared to 48% reporting low utilization. This finding presents an interesting contrast to the study by Fernández-Araque et al.

(2024), which found generally low knowledge levels of wound management among nurses. This suggests that despite potential knowledge gaps, nurses are actively incorporating honey into their wound care practices. The detailed analysis of honey utilization patterns shows several noteworthy trends. A majority of nurses (57%) either "always" or "often" use honey as a primary dressing for burn wounds (26.1% always, 30.9% often). This finding aligns with the systematic review by Yilmaz & Aygin (2020), which reported positive outcomes for honey in both acute and chronic wound treatment. Notably, 62.2% of nurses (31.3% always, 30.9% often) initiate honey use without waiting for a doctor's directive, indicating a high level of autonomy in wound care decisions. This contrasts with the findings of Obilor, Omolara & Ani (2021), where wound assessment was mostly perceived as physicians' responsibility rather than nurses'. However, the study reveals some concerning gaps in formal training and protocol adherence. Only 42.6% of nurses reported receiving training in honey use for burn wound management (17.7% always, 24.9% often), while 57.4% rarely or never received such training. This aligns with Beáta et al.'s (2025) findings that nurses are interested in further education but lack competencies. The combination of honey with other wound care products is practiced by 52.6% of nurses (20.9% always, 31.7% often), showing flexibility in treatment approaches. This practical approach mirrors the findings of Nshimyiyera (2020), where healthcare providers balanced practice-based knowledge with evidence-based knowledge in wound care decisions. It's particularly interesting that 53.8% of nurses (26.5% always, 27.3% often) prefer using honey over conventional dressings for minor burn injuries. This preference aligns with Malik, Malik & Aslam's (2020) findings demonstrating honey's superior efficacy over silver sulphadiazine in partial-thickness burns. The grand mean of 2.6 (above the 2.5 cut-off) indicates an overall high level of honey utilization among nurses, despite variations in specific aspects of use. This suggests that nurses recognize honey's

therapeutic value in wound care, consistent with the positive clinical outcomes reported in multiple studies reviewed in the literature. These findings suggest that while honey utilization is generally high among nurses, there remains a need for more structured training and standardized protocols to optimize its use in wound care settings.

Level of perceived clinical effectiveness of honey for the management of wounds

The study findings reveal that a significant majority of nurses (59%) perceive honey as having high clinical effectiveness in wound management, while 41% perceive it as having low effectiveness. This positive perception aligns with the systematic review findings of Yilmaz & Aygin (2020), which reported multiple beneficial effects of honey in wound healing. Regarding specific therapeutic benefits, 61.4% of nurses (27.7% strongly agree, 33.7% agree) believe that honey promotes faster wound healing compared to conventional dressings. This perception is supported by Malik, Malik & Aslam's (2020) clinical trial, which demonstrated significantly faster re-epithelialization in honey-treated sites compared to silver sulphadiazine (13.47 vs. 15.62 days). The antibacterial properties of honey received strong endorsement, with 62.6% of nurses (28.9% strongly agree, 34.9% agree) acknowledging this attribute. This aligns with Liche et al.'s (2023) findings, which showed significant reduction in bacterial wound colonization with honey treatment compared to silver sulphadiazine by day 10. Pain and inflammation reduction properties were recognized by 57% of nurses (25.3% strongly agree, 31.7% agree). This observation corresponds with Osman et al.'s (2022) systematic review, which found favorable outcomes for honey dressings in pain relief compared to conventional treatments. Notably, 55% of nurses (24.5% strongly agree, 30.5% agree) observed better tissue regeneration with honey treatment. However, this contrasts somewhat with Yukari et al.'s (2020) findings in deep burn wounds, where honey treatment couldn't prevent wound progression in animal models, highlighting potential limitations in certain

wound types. The comparison with modern antiseptic agents shows 54.2% of nurses (23.3% strongly agree, 30.9% agree) considering honey equally effective. This perception is supported by multiple studies, including Osman et al. (2022), which found honey dressings to be as or more effective than silver sulphadiazine in treating superficial and partial thickness burns. Patient response to honey treatment was reported as positive by 58.2% of nurses (25.7% strongly agree, 32.5% agree). This finding adds a important patient-centered perspective that wasn't extensively covered in the reviewed literature. The overall high grand mean of 2.7 indicates strong confidence in honey's clinical effectiveness across multiple aspects of wound healing. This positive clinical perception among practicing nurses provides practical validation to the experimental findings reported in various clinical trials and systematic reviews in the literature. These findings suggest that nurses' practical experiences with honey in wound care largely corroborate the evidence-based findings from clinical research, though some variation exists in specific applications and wound types. This alignment between practical experience and research evidence strengthens the case for honey's role in modern wound care practices.

Challenges of honey in the management of wound

The study findings reveal that 53% of nurses identified various factors as influential in their utilization of honey for wound management, while 47% considered these factors non-influential. This relatively even split suggests significant variability in how different factors impact honey utilization in clinical practice. Availability and accessibility emerged as major influencing factors, with 62.2% of nurses (29.7% agree, 32.5% strongly agree) citing availability as influential. This aligns closely with Mashbari et al.'s (2023) findings, which reported availability as a key factor (85%) affecting honey utilization. Similarly, accessibility concerns were noted by 59.4% of nurses (28.5% agree, 30.9% strongly agree), corresponding with Mashbari's reported 56% for

accessibility issues. Institutional acceptance showed interesting contrasts. While Mashbari et al. (2023) found 23% reporting institutional non-acceptance as a barrier, our study showed even lower institutional acceptance, with only 35.8% of nurses (18.9% agree, 16.9% strongly agree) reporting institutional support. This suggests that institutional barriers might be more significant in our study setting. Patient acceptability emerged as the most influential factor, with 67% of nurses (31.7% agree, 35.3% strongly agree) identifying it as significant. This finding adds a new dimension to previous studies, as patient acceptance wasn't prominently featured in the reviewed literature, though it aligns with Bahari et al.'s (2022) emphasis on considering patient preferences in clinical decision-making. Quality assurance concerns were evident, with 60.2% of nurses (26.9% agree, 33.3% strongly agree) citing difficulty in distinguishing between original and fake honey as influential. This connects with Molan's (2022) emphasis on the importance of scientific rationale and quality standards in honey selection for wound care. Cost considerations were reported as influential by 53.8% of nurses (23.7% agree, 30.1% strongly agree), which aligns with Mashbari et al.'s (2023) findings where 70% identified cost as a significant factor. However, our study shows a lower percentage of cost concern, suggesting possible regional variations in honey accessibility and pricing. Cultural beliefs showed minimal influence, with only 25.3% of nurses (14.5% agree, 10.8% strongly agree) citing it as a factor. This contrasts with Nshimyiyera's (2020) findings where cultural and traditional practices significantly influenced wound care decisions. The challenges in standardizing honey's bioactivities were acknowledged by 57.8% of nurses (26.5% agree, 31.3% strongly agree), reflecting concerns similar to those raised in Bahari et al.'s (2022) review about consistency in honey-based treatments. The overall grand mean of 2.6 indicates that these factors collectively have a significant influence on honey utilization in wound care. This finding supports the complex, multifactorial nature of clinical decision-making in wound care, as described by

multiple studies in the literature review. These findings suggest that while honey is recognized as an effective wound care option, its utilization is significantly impacted by practical, institutional, and quality-related factors. This understanding could help in developing strategies to overcome these barriers and optimize honey utilization in wound care settings.

5.2 Implication to nurses

The findings of this study have several important implications for nursing practice, particularly in the area of wound care management. First, the moderate level of utilization of honey for wound treatment observed among the respondents suggests that while some nurses are familiar with its benefits, there remains a significant portion who have either limited or no experience using honey in clinical settings. This highlights the need for continuous education and training to enhance nurses' knowledge and confidence in alternative wound care therapies such as honey.

Given that many respondents agreed that honey is effective in promoting wound healing—especially in terms of debridement, odor control, and tissue regeneration—there is a clear indication that integrating honey into routine wound care could improve patient outcomes. However, the inconsistent use and perception of its ability to prevent infection point to a need for standardized protocols and evidence-based guidelines that can support nurses in making informed decisions.

Furthermore, the absence of hospital protocols or formal institutional endorsement for the use of honey may limit its adoption, even among willing nurses. Therefore, healthcare institutions must consider developing and implementing clinical policies that support the use of honey, particularly when dealing with wounds that are difficult to manage using conventional dressings.

For nurses, embracing the use of honey in wound management not only broadens their clinical repertoire but also aligns with holistic and cost-effective approaches to care. As frontline healthcare providers, nurses play a vital role in evaluating and adopting safe, effective treatment methods. Strengthening their competence in using honey can empower them to advocate for its use, educate patients, and contribute to improved wound care outcomes.

5.3 Summary

This study explored the utilization and effectiveness of honey in wound management among nurses at the University of Benin Teaching Hospital. The findings revealed that while a considerable number of nurses are aware of honey's therapeutic properties—such as its ability to aid in wound healing, reduce inflammation, and manage infection—its actual usage in clinical practice remains moderate. Several factors influenced this pattern, including lack of institutional guidelines, limited access to medical-grade honey, and varying levels of knowledge among nurses.

Despite these challenges, many respondents recognized the effectiveness of honey in managing burn wounds and promoting tissue regeneration. However, concerns about patient acceptance, standardization, and support from hospital authorities were also highlighted. These findings emphasize the need for continuous professional education, institutional backing, and clear protocols to encourage the appropriate use of honey in wound care.

5.4 Conclusion

This study concludes that honey holds significant potential as an effective and affordable option for wound management, particularly in the treatment of burn wounds. The findings indicate that while nurses at the University of Benin Teaching Hospital possess a fair level of knowledge

regarding the therapeutic benefits of honey—such as its antimicrobial, anti-inflammatory, and healing properties—its practical application remains limited by institutional, logistical, and perceptual barriers.

The study highlights the importance of improving access to standardized medical-grade honey, strengthening institutional support, and providing continuous training to enhance nurses' confidence and competence in using honey for wound care. By addressing these challenges, honey can be better utilized as a complementary or alternative treatment in modern wound management practices.

5.5 Limitations of study

This study, while insightful, is not without its limitations. First, it was conducted in a single healthcare facility—University of Benin Teaching Hospital—thus limiting the generalizability of the findings to other hospitals or regions. The sample size was also relatively small and restricted to nurses available and willing to participate during the study period, which may introduce response bias.

Additionally, the study relied on self-reported data, which is subject to recall bias and social desirability bias, as respondents may have provided answers they believed were expected rather than reflecting their actual knowledge or practice. Furthermore, the cross-sectional design of the study captures perceptions and practices at a single point in time and does not account for possible changes over time.

Despite these limitations, the study provides valuable insights into the current state of knowledge and utilization of honey in wound management among nurses and serves as a foundation for further research in this area.

5.6 Recommendations:

Based on the findings of this study, several recommendations can be made to enhance the knowledge, acceptance, and effective use of honey in wound management among nurses:

1. Continuous professional development programs should be organized to educate nurses on the scientific basis, clinical effectiveness, and appropriate application of honey in wound care. Incorporating this knowledge into nursing curricula and workshops will help build confidence in its use.
2. Healthcare institutions should consider integrating honey-based wound dressings into their standard treatment protocols, particularly for burn and chronic wounds. Policies supporting the regulated procurement and usage of medical-grade honey should also be developed.
3. More extensive and multi-center studies should be conducted to strengthen the evidence base for honey's effectiveness in wound care. The results of such studies should be disseminated widely through journals, seminars, and clinical meetings to encourage evidence-based practice.
4. Authorities and healthcare providers must ensure that only medical-grade honey that meets quality and safety standards is used in clinical settings. This will help improve acceptance and minimize concerns about contamination or inconsistent therapeutic outcomes.
5. Sensitization campaigns should be conducted to educate both healthcare staff and patients on the benefits, safety, and proper use of honey in wound treatment. Addressing myths and misconceptions can lead to better acceptance and adherence.

5.7 Suggestion for Further study

To build upon the findings of this study, the following areas are suggested for further research:

1. Future studies could compare the effectiveness of honey with other conventional wound care treatments, such as silver sulfadiazine or hydrogel dressings, to provide more robust evidence of its relative efficacy.
2. There is a need for long-term studies that monitor wound healing progress over extended periods using honey-based dressings to assess sustained outcomes and recurrence rates.
3. Further research should explore patients' perspectives, satisfaction, and acceptance of honey in wound care to better understand how it influences treatment adherence and outcomes.

REFERENCES

Abdel-Salam, A.A., Sherif, E. & Mahmoud, I.K. (2022). Honey dressing: a missed way for orthopaedic wound care. *International Orthopedics*, **46**: 2483–2491.

Alvarez-Suarez, J., Giampieri, F., & Battino, M. (2023). Honey as a source of dietary antioxidants: structures, bioavailability and evidence of protective effects against human chronic diseases. *Current medicinal chemistry*, **20**: 621-638.

Anand, S., Deighton, M., Keen, J., O'Callaghan, R. J., Comyn, J., & Ambury, P. (2023). Biofield tuning a novel method for treating childhood eczema: A randomized controlled trial. *British Medical Journal*, **312**(7030): 553-557.

Ankan, N., Kaberi, C., Kankan, R., Ankit, M., Anroop, B.N., Pottathil, S., Mohamed, A., Neha, J., Manisha, P., & Bapi, G. (2024). Mechanistic Roles of Different Varieties of Honey on Wound Healing. *Journal of Pharmacology and Pharmacotherapeutics*, **15**(1): 5–18.

Ayse, C.Y. & Dilek, A. (2020). Honey Dressing in Wound Treatment: A Systematic Review. *Complementary Therapies in Medicine*, **51**: 102388.

Bahari, N., Hashim, N., Md Akim, A. & Maringgal, B. (2022). Recent Advances in Honey-Based Nanoparticles for Wound Dressing: A Review. *Nanomaterials*, **12**: 2560.

Beáta, G.H., Lucia, D., Kvetoslava, R. & Jarmila, K. (2025). Nurses' motivation, attitudes and knowledge in wound care: a cross-sectional study. *Journal of Nursing in the 21st Century*, **34**(5): 24-34.

Carlos, C.F., Frank, W., Hild, R. & Niels, A.J. (2022). Revolutionizing non-conventional wound healing using honey by simultaneously targeting multiple molecular mechanisms. *Drug Resistance Updates*, **62**: 100834.

Cooper, R. A., Molan, P. C., & Harding, K. G. (2023). Antibacterial activity of honey against strains of Staphylococcus aureus from infected wounds. *Journal of the Royal Society of Medicine*, **92**(6), 283-285.

Fernández-Araque, A., Mercedes, M.D., Jose-Maria, J., Maria, J.C. & Estela, C.G. (2024). Assessment of nurses' level of knowledge of the management of chronic wounds. *Nurse Education Today* 134: 10608

Hanaa, T. (2021). Honey in wound healing. *Open Life Sciences*, **16**: 1091–1100.

Jan, M., Almutairi, K.H., Aldugman, M.A., Althomali, R.N., Almujary, F.M. & Abu, N.A. (2021). Knowledge, attitudes, and practices regarding wound care among general population in Aseer region. *Journal of Family Medicine and Primary Care*, **10**: 1731-1736.

Khairan, K., Mudatsir, M., Diah, M., Rizal, M., Ikhlas, A.P., Miftahul, J. & and Chairani, I. (2024). Therapeutic activities of honey in wound care: a narrative review. *Earth and Environmental Science*, **1356**: 012025.

Liche, E., Zulu, R., Kasongo, Z.M. & Munthali, J.C. (2023). Effects of Silver sulfadiazine and Actilite® Honey on Bacteria Wound Colonization and Wound Healing in Children with Partial Superficial Burn Wounds at University Teaching Hospital, Lusaka, Zambia.

Medical Journal of Molan PC Zambia, **45**(4): 210-215.

Malik, K. I., Rahman, S. U., Agrawal, R., & Haque, S. E. (2020). Efficacy of honey in diabetic foot ulcer: A progressive clinical update. *Clinical Practice*, **10**(1): 1225.

Malik, K.I., Malik, M.A.N. & Aslam, A. (2020). Honey compared with silver sulphadiazine in partial-thickness burns. *International Wound Journal*, *7*: 413–417

Mashbari, H., Hamdi, S., Darraj, H., Awaf, M., Zaalah, S., Hakami, F., Hakami, K.M., Alhazmi, ,

Al khairat, L., Hakami, S.A., Aburasain, A., Hakami, I.A.I. & Arishi, A.A. (2023). Knowledge, attitude and practices towards surgical wound care and healing among the public in the Jazan Region. *Saudi Arabia. Medicine*, **102**(51): e36776.

Molan, P.C. (2022). The evidence and the rationale for the use of honey as a wound dressing.

Wound Practice and Research, **19**: 4.

Moore, O. A., Smith, L. A., Campbell, F., Seers, K., McQuay, H. J., & Moore, R. A. (2021). Systematic review of the use of honey as a wound dressing. *BMC Complementary and Alternative Medicine*, **1**: 2.

Nigussie, K., Subramanian, P.A., & Mebrahtu, G. (2020). Physicochemical analysis of Tigray honey: An attempt to determine major quality markers of honey. *Bulletin of the Chemical Society of Ethiopia*, **26**: 35-42

Nshimyiyera, J. (2020). Assessment of wound dressing practices among nurses, general practitioners and surgeons in Rwanda.

Obilor, H.N., Omolara, A.B. & Ani, O.B. (2021). A survey of nurses' wound assessment knowledge, attitude and competence in Nigeria. *Wound Practice and Research*, **29**(3): 140147.

Osman, S., Umar, H., Hashmi, Y., Jawaid, A. & Ahmed, Z. (2022). The Efficacy of Honey Compared to Silver Sulfadiazine for Burn Wound Dressing in Superficial and Partial Thickness Burns: A Systematic Review and Meta-Analysis. *Trauma Care*, **2**: 523–534.

Primavera, E. & Marzolani, C. (2023). Harnessing the sweet potential: the revival of honey dressing in modern wound care. I*nfermieristica Journal*, **2**(3): 139-142.

Scepankova, H., Combarros-Fuertes, P., Fresno, J.M., Tornadijo, M.E., Dias, M.S., Pinto, C.A.,

Saraiva, J.A., & Estevinho, L.M. (2021). Role of Honey in Advanced Wound Care. *Molecules*, **26**: 4784

Tang, Y., Chen, L. & Ran, X. (2024). Efficacy and Safety of Honey Dressings in the Management of Chronic Wounds: An Updated Systematic Review and Meta-Analysis. *Nutrients*, **16**: 2455.

Willix, D.J., Molan, P.C., & Harfoot, C.G. (2022). A comparison of the sensitivity of woundinfecting species of bacteria to the antibacterial activity of manuka honey and other honey.

Journal of Applied Bacteriology, **73**: 388-394.

Winny, T. & Widi, A. (2025). Effectiveness of Topical Honey Application on Wound Healing.

Journal La Medihealtico, **6**(1): 46-52.

Yilmaz, A.C., & Aygin, D. (2020). Honey Dressing in Wound Treatment: A Systematic Review.

Complementary Therapies in Medicine, **5**: 23-29.

Yukari, N., Kanae, M., Nasruddin, E.K., Terumi, I., Yukie, K., Junko, S. & Toshio, N. (2020). Evaluation of the Effects of Honey on Acute-Phase Deep Burn Wounds. Evidence-Based. *Complementary and Alternative Medicine*, **25**: 20.

APPENDIX

QUESTIONNAIRE

DEPARTMENT OF NURSING SCIENCE, SCHOOL OF BASIC MEDICAL SCIENCES, UNIVERSITY OF BENIN CITY, BENIN CITY,

EDO STATE.

Dear Respondent,

I**, MONDAY IMAOBONG** a 500level student of the above institution is carrying out a research study on the topic: "**UTILIZATION AND EFFECTIVENESS OF HONEY IN WOUND MANAGEMENT BY NURSES IN THE UNIVERSITY OF BENIN TEACHING HOSPITAL"** as part of the requirement for the completion of a Bachelor's Degree in Nursing Science. Kindly and sincerely provide answers to the questions in the space provided. Every information provided is highly confidential and strictly for academic purpose. No names required. You may decide to answer questions that best suits your understanding and for the accuracy in statistics. Please be independent and truthful as possible. Thank you.

Yours faithfully, Monday Imaobong

QUESTIONNAIRE

Utilization and Effectiveness of Honey in Wound Management by Nurses in University of Benin Teaching Hospital

Instruction: Please respond to the questions below. Your answers will be kept confidential and used only for research purposes. Tick (✓) the option that best represents your opinion.

Section A: Demographic Data

1. Age (years)

   18-25 [ ] 26-35 [ ] 36-49 [ ] Above 50 [ ]

2. Gender (Sex)

   Male [ ] Female [ ]

3. Marital status Married [ ] Single [ ]
4. Religion Christian [ ] Islamic [ ] Paganism [ ]
5. Year of experience

   1-5 years [ ] 6-10 years [ ] 11-15 years [ ] Above 15 years [ ]

Section B: Utilization of Honey in Wound Management

6. Are you aware of the clinical evidence regarding the effectiveness of honey in wound care?

   Yes [ ] No [ ]

7. Have you utilized honey wound-care products in your practice?

   Yes [ ] No [ ]

8. Do you encourage honey use in dressing?

   Yes [ ] No [ ]

   If yes, what type of wound injury would you encourage honey use in wound care?

   Infected wound [ ] Deep wound [ ] Any type of wound [ ]

9. What type of honey would you prefer in the management of wound?

   Natural honey [ ] Artificial honey [ ]

10. Why do you use honey for wound dressing in your unit?

    It is cheaper than other dressing [ ]

    It is more effective than others [ ]

    It has antimicrobial properties [ ]

    It is easy to remove [ ]

    It is affordable than others [ ]

    Others specify [ ]

11. Would you consider using honey in wound care if more high-quality evidence were

available?

Yes [ ] No [ ] Not sure [ ]

Section C: Effectiveness of Honey in Wound Management

12. Is honey effective in the wound management?

Yes [ ]

No [ ]

13. Do you believe that honey stimulates tissue repair and growth in wound healing?

Yes [ ]

No [ ]

Not sure [ ]

In your experience, does honey reduce inflammation during the wound healing process?

Yes [ ] No [ ] Not sure [ ]

14. Do you believe that honey's bioactivities (e.g., antibacterial, anti-inflammatory) contribute significantly to its effectiveness in wound healing?

Yes [ ] No [ ] Not sure [ ]

15. Have you found honey to have antioxidant properties that influence oxidative stress in wounds?

    Yes [ ] No [ ] Not sure [ ]

16. In your observation, do honey wound-care products improve healing times compared to conventional wound dressings for superficial wounds and burns?

    Yes [ ] No [ ] Not sure [ ]

17. Is honey used in wound dressing effective in all degree of burn injury?

    Yes [ ] No [ ]

18. If no above, specify

    Deep wound [ ] Infected wound [ ] Any type of wound [ ]

19. Comparing honey to other dressing agents,

    What percentage of effectiveness can be allotted to honey use in wound care

    25-50% [ ] 50-70% [ ] 70-90% [ ] 90-100% [ ]

Section D: Factor Influence Honey Utilization

S/N	Questionnaire item	Agree	Strongly Agree	Disagree	Strongly Disagree
22	Availability of the honey				
23	Not acceptable in the institution				
24	Honey is very painful in wound dressing				
25	Acceptability by the patient				
26	Against my cultural belief				
27	Inability to distinguish between original and fake				
28	Not easily accessible				
29	Cost of buying honey				
30	Right type of honey				
31	Challenges in the standardization of the bioactivities of honey				