

## MODERN AND CLASSIC WOUND DRESSING COMPARISON IN WOUND HEALING

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**Abstract.** Wound care has also developed rapidly after the dissemination of the concept of TIME (Tissue, Infection, Moisture, and Wound Edge) in modern dressing (MD). The aim of this study was to compare modern dressings (MDs) and classic dressings (CDs) in terms of patient comfort, cost effectiveness and wound healing. A prospective study design with total of 25 participants. The sampling technique used was consecutive sampling. Patient comfort was assessed through the frequency of wound care and pain scale using the Visual Analogue Scale (VAS). Cost-effectiveness was assessed using direct and indirect costs. Wound healing was assessed using the Bates-Jensen Wound Assessment Tool (BWAT) score. The data was analyzed using the independent t and Mann-Whitney tests. The application of MD has the same cost-effectiveness as CD with amore satisfactory outcome for the wounds in terms of comfort and healing.

**Keywords :** classic dressing; cost effectiveness; modern dressing; patient comfort, wound healing

### INTRODUCTION

A wound is a disorder of the normal condition of the skin in the form of damage to its continuity due to a pathological process, be it internal or external. Wounds often occur in daily life and they can lead to serious complications if not treated adequately (Gonzalez, Andrade, Costa, & Medrado, 2023). The incidence of wounds is increasing annually. More than 1.2 million people have died globally due to traffic accidents and between 20-50 million people have suffered non-fatal injuries, including wounds. Most injuries, both acute and chronic in the global population, are caused by trauma (48.00%), foot ulcers (28.00%) and pressure sores (21.00%). Acute wounds occur with a rapid onset and the healing process can be estimated. For example, injuries due to trauma or surgery. The healing process for chronic wounds cannot be predicted, for example, as in pressure ulcers, injuries due to malignancy and others (Gurtner, 2023). In developing countries, 1-2% of the population is predicted to have suffered from a chronic injury during their lifetime (Hurley, Knepper, & Price, 2023).

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In Indonesia, the incidence of injuries is quite high along with the increasing incidence of traffic accidents in recent decades. In Medan, particularly at the Malahayati Islamic Hospital in Medan. There was a male to female ratio of four to one; 90% of them were injuries due to trauma. Both acute and chronic wounds require good wound care and management. Wound management is an act of wound care that includes all elements including comorbid control and complications that can result from an injury. MDs are a product of high-tech wound dressing. This type of dressing is able to control the humidity around the wound. A humid atmosphere will help to provide the atmosphere needed for there to be a local defense made by macrophages, accelerating angiogenesis and thus accelerating the wound healing process. In addition, it is expected that the use of MD can further increase the cost effectiveness and comfort of the patients (Daunton, Kothari, Smith, & Steele, 2023). The application of wound care methods through the MD route in Indonesia is still relatively small. This is because the majority of health care facilities tend to use CD. The aim of this study was to compare modern dressings (MDs) and classic dressings (CDs) in terms of patient comfort, cost effectiveness and wound healing.

## **METHODS**

This was a clinical observational study conducted using a prospective design approach in order to compare the outcome of wound care between MD and CD. The research subjects were orthopedic and traumatology patients with wounds treated in the surgical ward of Malahayati Islamic Hospital. The inclusion criteria consisted of acute wounds caused by trauma where the raw surface of the wounds was 50-500 cm<sup>2</sup> and where the depth of the wound ranged from partial to full thickness with skin loss down to muscle level. The exclusion criteria in this study included wounds with a raw surfaces of less than 50 cm<sup>2</sup> or more than 500 cm<sup>2</sup>, wounds that are without an exposure of bone, tendon, nerve, vascular and cartilage and wounds in patients with multiple traumas or with comorbidities like anemia, hypoalbuminemia or systemic diseases such as diabetes mellitus or malignancy. Scale using the Visual Analogue Scale (VAS). Cost-effectiveness

was assessed using direct and indirect costs. Wound healing was assessed using the Bates-Jensen Wound Assessment Tool (BWAT) score.

The dependent variable in this study is the type of dressing (MD and CD) while the independent variables are (1) patient comfort assessed by how often wound care was performed and the pain scale each time that wound care was performed, (2) cost effectiveness as seen from the direct and indirect costs and (3) wound healing. Wound care was carried out by the orthopedic resident based on the standard operational procedures for wound care in the hospital of Medan Province. First, hand scrubbing was conducted. An explanation of the procedure of wound care was given to the patient, followed by patient identification. The use of gloves was emphasized. The wound dressing was removed with tweezers and disposed of. The wound was cleaned with gauze and NaCl 0.9% from the inside out. The condition of the wound was noted and documented. The wound was closed with a primary dressing, followed by a secondary dressing. The dirty gauze was disposed of and the tweezers were cleaned in a 0.5% chlorine solution.

## **RESULTS AND DISCUSSIONS**

The results of this study have been presented in tables and diagrams. The patients with wounds treated using MD totaled 13 men and 2 women. The patients with wounds treated using CD amounted to 6 men and 4 women. Patients with wounds treated using MD consisted of 6 people aged less than 30 years old, 5 people aged 30 to 50 years old and 4 people aged over 50 years old. Patients with wounds treated using CD consisted of 4 people aged less than 30 years old, 4 people aged 30 to 50 years old and 2 people aged more than 50 years old. Seven patients treated using MD suffered from upper extremity wounds and 8 patients suffered from lower extremity wounds. The patients with wounds treated using CD consisted of 1 person suffering from a wound in the upper extremities and 9 people suffering from wounds in the lower extremities.

According to the demographic data, most of the causes of injuries were traffic accidents. It was found that the majority of patients were male (76%) and the rest were female (24%). Among the patients who used MD, 87% of them were male and 13% were female. Regarding the patients who used CD, 60% were male and 40% were female. These results are consistent with other studies where men are the more common accident

victims compared to women with a ratio of 3.2: 1 (Laiou et al., 2023). This relates to the proportion of road users being mostly male and the characteristics and attitudes of male motorists during traffic (Nastiti, 2022).

Based on age, it was found that the majority of patients were younger than 30 years old (40%). The patients aged 30-50 years totaled 36% and those over 50 years totaled 24%. In the patients using MD, it was found that the majority of patients were under the age of 30 years (40%), the patients aged 30-50 years totaled 33% and those over 50 years old totaled 27%. In the patients using CD, it was found that the patients under 30 years old totaled 40%, the patients aged 30-50 years totaled 40% and those over 50 years totaled 20%. The traffic accidents predominantly involved motorcycle riders with an average age of 15-29 years.

Teenagers and young adults, especially from among the male population, were most at risk of traffic accidents, with the prevalence rates ranging from 11.1 to 42.6% for the 20-30 years old age group and from 4.6 to 97.2% for male subjects overall (Khatib, Gaidhane, Quazi, & Khatib, 2022). In terms of patient comfort, the indicators were assessed included frequency of wound care being done and the pain scale during the wound care procedure being performed. In this study, the frequency of wound care performed on patients using CD was more often when compared to the wound care when done using MD.

In addition, the pain scale experienced by patients treated with MD and CD was also different, where the patients who used MD tended to find it less painful than those who used CD. Wound care is an action used to achieve wound healing which involves different emotional aspects for each individual who experiences it, including pain. The more frequently that wound care is done, the more likely it is that the patient feels uncomfortable. It is undeniable that pain can affect wound care procedures. Pain that is not treated adequately can have a negative impact on wound healing and the quality of life of the patients.

In a multinational study conducted by the European Wound Management Association (EWMA), clinicians assessed that the time to change the dressings when wound

care is performed is where pain is felt most severely (Moffatt, Franks, & Hollingworth, 2024). Pain during wound care (procedural pain) is closely related to the type of dressing used and this can be assessed using VAS. The selection of a type of dressing that does not adhere to the wound base and that can be easily removed will be very helpful in terms of reducing patient pain. Gauze is most likely to cause pain because it tends to be more adherent to the wound base and Siltec is a type of silicone dressing that is more easily released when changing dressings. According to Morris (2019), based on his research on burns in pediatric patients, the use of silicone dressings can minimize the incidence of trauma and pain in most patients who are the subject of his research (Morris, 2019).

In terms of cost effectiveness, especially indirect costs, it can be seen from the duration of the wound that it is good to do the soft tissue coverage procedure. This measurement can also be based on the Length of Stay / LOS. In this study, the indirect cost of using CD was the same as the wound care for patients using MD, which was in parallel to direct cost. In other words, the costs incurred in the use of both types of dressings for wound care were not much different. Furthermore, when viewed in terms of wound healing, the BWAT score can give us an idea of the wound condition of each patient when first treated until the end when the wounds are declared to be ready for the soft tissue coverage procedure (Greatrex-White & Moxey, 2022). The initial BWAT score for

This is consistent with the research conducted by Rook et al (2019) which states that silicone dressings (a type of modern dressing material) have the ability to reduce exudates, to provide a moist wound environment for optimal healing, to keep the tissue around the wound healthy, to avoid maceration, and to minimize pain. The use of CutimedSiltec with material from silicone foam is instrumental to deliver water vapor and oxygen, in addition to providing thermal insulation to the wound bed. Its main advantage is its ability to accommodate exudates and is able to protect healthy tissue around the wound, because the material is highly absorbent and able to spread the exudate evenly throughout the absorbent layer and prevent leakage with semi-permeable material on the back.

## CONCLUSION

Based on the comparison of the indirect and direct costs, modern dressings have the same cost effectiveness as classic dressings. In terms of wound healing using the BWAT score, modern dressings have better efficacy compared to classic dressings.

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