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EFFECTIVENESS OF HEDON (HEEL DONUT) AS AN EFFORT TO PREVENT PRESSURE ULCERS ON THE CALCANEAL OF TRACTIONED PATIENTS

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ABSTRACT
Fracture is a condition where the continuity of bone tissue and/or cartilage is completely or partially broken, caused by force trauma or osteoporosis. Fracture management includes conservative measures and surgical procedures. Conservative measures given include plaster casts, splints, skin traction, bone traction, as well as repairs by manipulation and repositioning to a position close to normal. One of the impacts of installing skeletal traction is pressure ulcers. Pressure ulcers are a problem that often occurs in prominent bony areas such as the heel (calcaneal). Objective: patients who are installed in skeletal traction. Method: using pre-experimental methods with One-group pre-post test design techniques. Results: Based on the occurrence of pressure ulcers before being given the heel donut, there were 8 patients who did not experience pressure ulcers with a percentage of 57.1% and 6 patients who experienced stage 1 pressure ulcers, 42.8%. After being given the heel donut, 14 patients did not experience pressure ulcers with a percentage of 100% and no respondents experienced stage 1 pressure ulcers after being given the heel donut. Conclusions: Hedon (heel donut) is effective in preventing pressure ulcers in the calcaneal of patients who are installed in skeletal traction.

Keywords: hedon (heel donut); pressure ulcer; skeletal traction

INTRODUCTION
Fractures or broken bones are physical injuries that are often found in Indonesia. This health problem has become a public concern because there are still many fracture cases without proper treatment. Fractures are the third cause of death in Indonesia after Coronary Heart Disease and Tuberculosis. Fractures are caused by shock or physical exertion, accidents, both work accidents and traffic accidents (Noorisa et al., 2017). Because broken bones are a potential or real threat to a person's integrity, they experience physiological and psychological disorders that can cause reactions in the form of pain. According to Gusty and Armayanti (2014) the principles of fracture treatment include reduction, retention and rehabilitation. According to Putri and Sarifah (2015) fracture management includes conservative and surgical measures. Conservative measures include: placing casts, splints, skin traction, bone traction, as well as repairs by manipulation and repositioning to a position close to normal.

Traction is a resistance used with weight or other tools to treat damage or disorders to bones and muscles, meaning to treat fractures, dislocations or muscle spasms in an effort to correct deformity and speed healing. One of the impacts of installing skeletal traction is pressure ulcers, the occurrence of pressure ulcers is a problem that often occurs in prominent bony areas such as the heel (calcaneal), which is caused by conservative medical procedures, meaning temporary measures before definitive or operative measures (Morison 2014) . The first sign of a pressure ulcer

is redness in the heel area. The use of innovation with hedon (heel donut) is a preventive treatment for pressure ulcers in the saute area for patients who have skeletal traction installed. The patient's fear of moving is due to the patient's lack of knowledge due to adaptations attached to traction, apart from that, the nurse's lack of knowledge regarding measures to prevent decubitus in the heel area due to inadequate facilities so that nurses lack innovation on how to increase competence in preventing decubitus incidents or due to poor personal hygiene. lack and/or uneven pressure on the skin around the heel (Suratun, et al. 2018).

At Dr. Orthopedic Hospital. Soeharso Surakarta, the number of patients who had traction installed was quite large, seen in the last 2 weeks from 13 - 24 March 2023 who came to the emergency room with advice to be given skeletal traction, a total of 14 patients. The results of observations made on patients who had traction applied showed redness in the heel area. Providing fabric heel pads causes irritation in the heel area because it does not conform to the anatomy of the heel. Patients who were observed were patients who had been hospitalized for 5 days. A patient who experiences immobility can be known to have early symptoms or signs of having a decubitus wound or another term pressure ulcer for more than 6 hours. Patients who have skeletal surgery installed at the Otopedic Hospital will be given treatment for 14 days, after which they will be re-observed to see whether the procedure is able to restore bone function. Based on the background above, we want to know how effective the hedon (heel donut) is in preventing pressure ulcers in the calcaneal patients with skeletal traction.

METHOD

This research design was pre-experimental with a one-group pre-post test design technique. The population in this study were patients who had skeletal traction installed at Dr. Orthopedic Hospital. Soeharso Surakarta with samples that met the research inclusion criteria according to the consecutive sampling technique. The independent variable is heel donut and the dependent variable is the incidence of calcaneal pressure ulcers. Pressure ulcer assessment uses the NPUAP wound stage. The tools and materials in this study used assistive devices shaped in a circle like a donut made from silicone (gel), installed on the patient's heel which was attached to skeletal traction so that the heel did not receive pressure due to the immobilization process. Statistical tests use the Wilcoxon Signed Rank Test with a significance value of $p \leq 0.05$.

RESULTS AND DISCUSSION

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Table 1.
Frequency distribution of respondents based on age

Age (Years)	f	%
20-30	2	14,3
31-40	2	14,3
41-50	4	28,6
> 60	6	42,8

Based on the table above, it is found that the majority are > 60 years old, 42.8%. Ages 41-50 years were 28.6%, ages 31-40 years were 14.3%, the same as respondents aged 20-30 years with a percentage of 14.3%.

Table 2.
Frequency distribution of respondents based on gender

Gender	f	%
Man	9	64,3
Women	5	35,7

Characteristics of respondents based on gender, the majority of respondents in this study were male with a percentage of 64.3% totaling 9 patients. Meanwhile, 5 patients were female respondents with a percentage of 35.7%.

Table 3.
Frequency distribution of respondents based on medical diagnosis

Medical Diagnosis	f	%
Femur fracture	3	21,4
Collum femur fracture	6	42,9
Intertrochanter femur fracture	4	28,6
Tibia fracture	1	7,1

Characteristics of respondents based on medical diagnosis, the majority of respondents with intertrochanteric femur fractures were 6 patients with a percentage of 42.9%. Another medical diagnosis was an intertrochsternal fracture of the femur with a number of respondents of 4 patients amounting to 28.6%. Meanwhile, femur fractures in 3 patients had a percentage of 21.4% and tibia fractures in 1 patient had a percentage of 7.1%.

Table 4.
Distribution of respondents based on the occurrence of Pressure Ulcer

Stadium Pressure Ulcer stage	Before being given a heel donut		After being given a heel donut	
	f	%	f	%
Pressure ulcers do not occur	8	57,1	14	100
Stage 1	6	42,8	0	0

Based on table 4, it shows that the characteristics of respondents based on the occurrence of pressure ulcers before being given the heel donut, there were 8 patients who did not experience pressure ulcers with a percentage of 57.1% and 6 patients who experienced stage 1 pressure ulcers, 42.8%. After being given the heel donut, there were 14 respondents who did not experience pressure ulcers with a percentage of 100% and no respondents experienced stage 1 pressure ulcers after being given the heel donut.

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Table 5.
Differences in the distribution of pressure ulcers on the calcaneal before and after being given a heel donut to patients who were placed in traction

Variabel	Pre-test		Post-tes		t	*P-Value*
	M	SD	M	SD		
The occurrence of pressure ulcers	39,14	3,270	32,34	3,676	14,56	0,000

The table above shows that there is a difference before and after being given the heel donut with a P-Value of 0.000, so it can be concluded that the heel donut is effective in preventing the occurrence

of pressure ulcers on the patient's heels that are installed with traction.

Characteristics of respondents based on majority age above 60 years, namely 6 people with 42.8%. Age can also influence the occurrence of pressure ulcers. In old age, it is very easy for pressure ulcers to occur. This is because in old age there are changes in skin quality where there is a decrease in elasticity and lack of circulation in the dermis (Dewandono, 2014). The results of this study are in line with research by Widodo (2017) that the dominant age at risk of developing pressure ulcers is adults (25-65 years). In contrast to other research, according to Ayelo and Braden (2012), the greatest risk is when you are over 80 years old. According to Suriadi (2017) the average age of people experiencing pressure ulcers is 50 years old.

Older patients are at higher risk for pressure ulcers because skin and tissue change with aging. Aging results in muscle loss, decreased serum albumin levels, decreased inflammatory response, decreased skin elasticity, and decreased cohesion between the epidermis and dermis. These changes combine with other aging factors which will make the skin become less tolerant of pressure, friction and tearing forces (Irawan, 2014). Elderly patients on total bed rest are at greater risk of developing pressure ulcers (Huda, 2012). Patients who are in traction do not have the ability to mobilize, patients who lie continuously in bed without being able to change positions are at high risk of developing pressure ulcers. Pediatric patients aged less than 24 months are at risk of developing pressure sores in the occipital area. Table 2 shows that the majority of patient characteristics based on gender are male, with 9 patients with a percentage of 63.4%. This factor is associated with the incidence of femur fractures which occur more frequently in men. This is in line with the opinion of Triono (2015) who states that fractures occur more often in men than women under 45 years of age, often related to sports, work or injuries caused by motorized vehicles. At the age of 45 years, women experience fractures more often than men, which is associated with an increased incidence of osteoporosis associated with hormonal changes at menopause.

The distribution of respondents based on medical diagnoses that included traction was intertrochanteric femur fracture, 6 people with 42.9%. Intertrochanteric femur fractures often occur in older people aged between 65-80 years. Femur intertrochanteric fractures are caused by hard impacts, accidents, muscle fatigue, osteoporosis or bone loss due to increasing age (Perwiraputra et al., 2017). Trauma involving the femur, trochanter area are all fractures that occur between the greater and lesser trochanter. This fracture is extra-articular and often occurs in people aged 60 years. Bone fractures occur between the greater and lesser trochanters where the proximal fragment tends to shift in a varus manner. Fractures can be comminuted, especially in the postero-medial cortex (Muttaqin, 2018). The occurrence of pressure ulcers is shown in table 4, before being given the heel donut, there were 8 patients who did not experience pressure ulcers on the calcaneal with a percentage of 57.1%, while the remaining 6 patients, namely 42.8%, experienced pressure ulcers on the calcanal stage 1 which was characterized by the heel feels painful and looks pale, if touched it is colder than the surrounding area. After being given the heel donut, it showed that 14 respondents did not experience pressure ulcers on the calcaneal with a percentage of 100%. The results of the difference before and after being given the heel donut on the occurrence of pressure ulcers on the calcaneal were p-value 0.000. This shows that the donut helmet is effective in preventing pressure ulcers in patients who have skeletal traction installed. Bed rest or what can be called mobility is a condition where a person cannot move actively or freely due to conditions that

interfere with activities. Several conditions can cause bed rest, including joint and bone disorders, diseases related to the nerves, heart and breathing as well as critical illnesses that require bed rest. The negative impact of bed rest on the physical is that it will damage the integrity of the skin, one of which can cause pressure ulcers (Rismawan, 2014).

According to Maklebust in Potter & Perry (2016), changes or prevention of pressure ulcers can occur if the pressure is removed before the critical point, then the vascular circulation in the tissue will recover through the physiological mechanism of reactive hyperemia, because the skin has a greater ability to tolerate ischemia. from the muscles because decubitus occurs starting in the bones with muscle ischemia associated with pressure which eventually extends to the epidermis. One of the treatments that can be done to treat a fracture before undergoing surgery is traction. Traction is resistance that is used with weight or other tools to overcome damage or disorders to bones and muscles that have fractures, dislocations or muscle spasms in an effort to correct deformities and speed up healing. There are two types of traction, namely skeletal traction and skin traction (Smeltzer & Bare 2016). Skeletal traction is an action used to treat fractures of the femur, tibia, humerus, and cervical spine where a pin is inserted into the bone as traction which pulls the extremity affected by the fracture, thus allowing the patient to move within certain limits and allowing the patient's independence and effective medical and nursing services (Smeltzer & Bare, 2016).

The impact of installing traction is bed rest for a long time which can trigger pressure ulcers. Pressure ulcers are damage to the skin in an area and the base of the tissue caused by protruding bones, as a result of pressure, shifting, friction or a combination of several of these things (NPUAP, 2014). The prevention and treatment that can be carried out according to Guys, (2012) and Dewando (2014) includes carrying out risk assessments, using assistive devices and massage. The use of assistive devices that can be provided is the use of a heel donut on the heel to reduce pressure ulcers. According to Ronald (2018), the device that is placed on the heel of patients who require skeletal traction either because of conservative or surgical preparation in the immobilization process is with a modified donut heel using silicone gel. The use of heel donuts can reduce or even prevent the occurrence of pressure ulcers, this happens because the use of heel donuts can stimulate peripheral vascular circulation in the heel area, smoothly without any obstacles because the heel area is not under pressure due to static forces. In patients who have skeletal traction installed, the calcaneal/heel is the area that experiences pressure due to the installation which requires the patient to reduce movement. This causes pressure on the calcaneal tissue and this situation causes an increase in skin cell metabolism at the pressure point which is disturbed, but depends on the intensity of the pressure that closes the capillary vasculature, the duration and magnitude of the pressure and the body's pressure tolerance threshold (Kozier, 2017).

CONCLUSION

Hedon (heel donut) is effective in preventing pressure ulcers in the calcaneal of patients who are installed in skeletal traction

REFERENCES

Al Kharabsheh, M., Alrimawi, R., Al Assaf, R., Saleh, M. 2014. Exploring Nurses' Knowledge and Perceived Barriers to Carry Out Pressure Ulcer Prevention and Treatment,

Documentation, and Risk Assesment. American International. Journal of Contemporary Research, 4(4), 112 – 119

Kozier 2010. Buku Ajar Fundamental Keperawatan: Konsep, Proses dan Praktik. (Ed.7). Jakarta : Penerbit Buku Kedokteran EGC

Ningsih, Nurma & Lukman. 2011. Asuhan Keperawatan pada Klien dengan Gangguan Sistem Muskuloskeletal. Jakarta : Salemba Medika

Potter & Perry. 2016. Fundamental Of Nursing: Fundamental Keperawatan (Ed.7). Jakarta : Salemba Medika.

Noorisa R, Apriliwati D, Aziz A, Bayusentono S. The characteristics of patients with femoral fracture in Department of Orthopaedic and Traumatology RSUD Dr. Soetomo Surabaya 2013-2016. (2017). Journal of Orthopaedic & Traumatology Surabaya. 6(1):1-11.

Gusty, R.P dan Armayanti. (2014). Pemberian Latihan Rentang Gerak terhadap Fleksibilitas Sendi Anggota Gerak Bawah Pasien Fraktur Femur Terpasang Fiksasi Interna di RSUP Dr. M. Djamil Padang. Jurnal Vol 10 No 1. Diakses pada tanggal 26 Oktober 2023.

Marison, M.J. (2014). Manajemen Luka. Penerbit Buku Kedokteran : EGC.

Suratun & Heryati. (2018). Klien Gangguan Sistem Muskuloskeletal : Seri Asuhan Keperawatan. Jakarta : EGC.

AHCPR (1994) dalam Dewandono (2014). (2014). Treatment Of Pressure Ulcers Clinical Practice Guideline. No. 15. AHCPR. Publicaton number 95-0652. Rockville, MD: Agency For Healthy Care Policy And Research.

Dewandono. (2014). Asuhan Keperawatan Medikal Bedah Penyakit Dalam. Yogyakarta : Nuha Medika Evelyn C.

Perwiraputra RD, Priambodo A, Julianti HP. Hubungan Jenis Total Hip Arthroplasty Terhadap Derajat Fungsional Panggul dan Kualitas Hidup pada Pasien Fraktur Collum Femoris. (2017) Jurnal Kedokteran Diponegoro. 2017 April; 6(2):1116-25.

NPUAP. (2014). Prevention And Treatment Of Pressure Ulcer : Quick Reference Guide. First edition 2009. National Pressure Ulcer Advisory Panel;20- 26.

Smeltzer, S. C., & Bare, B. G. (2016). Buku Ajar Keperawatan Medikal Bedah. Jakarta: EGC.