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Efficacy Of Regular Positioning with Ripple Mattress Vs Ripple Mattress Alone in Preventing Pressure Ulcer Among Geriatric Patients in Medical Ward

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ABSTRACT

Evans et al. (2023) highlight that pressure ulcers can lead to severe complications, significantly reducing quality of life and even increasing mortality rates among affected individuals. Hence, early prevention and treatment of pressure ulcers, especially in high-risk patients, is crucial. Geriatric patients are particularly vulnerable to developing pressure ulcers due to factors like reduced mobility, skin fragility, and multiple comorbidities. This research aims to assess the effectiveness of frequent repositioning using ripple mattresses in preventing pressure ulcers among elderly patients in medical wards. Specifically, it will compare the efficacy of using ripple mattresses alone versus in combination with other interventions. The study is designed as a prospective interventional trial with the primary goal of evaluating the effectiveness of different strategies to prevent pressure ulcers in immobilized elderly patients. Conducted at General Hospital Melaka, the study will take place in a controlled setting, assessing the impact of preventive measures over a specific period. The success of the intervention is demonstrated by notable improvements in Braden Scale scores and a reduction in pressure ulcer incidence in the group receiving the combined intervention. By adopting evidence-based strategies, healthcare professionals can significantly enhance patient care, reduce the prevalence of pressure ulcers, and improve the quality of life for at-risk elderly patients.

Keywords: Regular positioning, ripple mattress, pressure ulcers and geriatric patients

1.0 INTRODUCTION:

Patients with restricted movement, such as those with spinal cord injuries (SCI), are highly susceptible to developing pressure ulcers (PUs), also known as pressure injuries. These ulcers arise from prolonged pressure on the skin, which restricts blood flow and causes tissue damage. Factors like immobility, diminished sensation, and physiological changes increase the risk of pressure ulcers. Research shows that 25% to 66% of SCI patients suffer from PUs (Gefen, 2018). A study at Kuala Lumpur Hospital found that 57% of patients with traumatic SCIs were admitted with PUs, especially among young males (ages 14-45) and older males (ages 55-75), highlighting their vulnerability to these injuries.

Pressure ulcers affect both physical health and quality of life, increasing mortality and the need for long hospital stays (Evans et al., 2023). Among older adults, the risk is exacerbated by factors like thinner skin and limited mobility, and inadequate prevention guidelines contribute to their prevalence (Bauer, 2016). Studies show that many nurses lack current knowledge on PU prevention (Renganathan et al., 2018), emphasizing the need for effective strategies, such as ripple mattresses and regular repositioning, to reduce PU risks (Tom et al., 2022). Frequent repositioning, dating back to Florence Nightingale's nursing principles, remains a crucial practice in preventing PUs and improving patient care (Kalisch et al., 2022). Lima Serrano's research suggests that repositioning patients every four hours can prevent the development of Grade II pressure ulcers, with Mauricio Herrera et al. (2021) affirming it as an effective strategy for high-risk patients to improve conditions and reduce hospital costs. This practice, vital in nursing for nearly two centuries (Schutt et al., 2018), enhances blood circulation and healing (Wound Source Learning Network, 2023). In addition to repositioning, the use of ripple mattresses, which alternate pressure points, further helps prevent pressure ulcers.

2.0 STUDY BACKGROUND

Pressure ulcers (PUs) are a major global health concern, affecting millions of individuals and ranking among the top five illnesses commonly seen in hospitals. As Evans et al. (2023) note, PUs can significantly reduce quality of life and even increase mortality rates, making early prevention and treatment critical, especially for high-risk patients such as the elderly. Geriatric adults are more susceptible due to factors like reduced mobility, fragile skin, and comorbidities, and many healthcare settings lack standardized preventive methods to address this issue. Veterans over 65 are particularly at risk, with higher rates of disability contributing to PU prevalence (McDaniel, 2020). Bauer (2016) found that inadequate documentation of patient repositioning in electronic health records (EHR) and inconsistent preventive strategies contribute to this problem in elderly patients. A major obstacle to effective PU treatment is the insufficient knowledge among healthcare staff about prevention techniques. Renganathan et al. (2018) found that many nurses lack awareness of common PU sites and prevention methods, emphasizing the need for improved education and training.

3.0 METODOLOGY

This research is planned to be a prospective interventional trial, and its primary objective is to evaluate the efficacy of different therapies that are targeted at avoiding pressure ulcers among elderly patients who are immobilized. During this research, which will be carried out in the medical wards of the General Hospital. The elderly patients with the age of 65 years of age and above will be selected for this research project.

Inclusion Criteria	Description
Geriatric patients aged 65 years and older	Patients must be 65 years or older to be included in the study.
Patients admitted to the medical ward within six months	Patients must have been admitted to the medical ward within six months.
Patients with no pre-existing pressure ulcers	Patients should not have any existing pressure ulcers at the start of the study.

Data Collection and Assessment

We will collect demographic data for each subject regarding age, sex, medical history, and baseline Braden Scale scores. The Braden Scale is taught in nursing colleges worldwide, and is used as a standard predictor of future pressure ulcer risk. By obtaining this measure of each participant's initial risk level, we will be able to better evaluate the pressures of our environment. Three weeks later, we will obtain repeated Braden Scale scores along with Comprehensive Skin Assessment Scores for all subjects in all three of our groups. This in-depth skin examination can identify surface changes within the upper layers of the skin. At the same visit, features associated with pressure ulcer development will be recorded based on their presence in the patients' nursing records, such as the size and location of any new pressure ulcers that developed at least once during the study period, and the severity of the ulcer's width, length, and depth (Rosa et al, 2020).

4.0 RESULTS AND DISCUSSION

4.1 INTRODUCTION

The analysis of the data that was produced from the replies to the questionnaire and the data collected from patients from November 2023 to February 2024 is presented in this chapter. The material consists of demographic details, medical histories, and the results of several treatments that were implemented at General Hospital Melaka to avoid pressure ulcers among elderly patients. Following the organization of the data into tables and the interpretation of the data, a clear explanation of the conclusions of the research is provided.

4.2 DEMOGRAPHIC DATA OF STUDY PARTICIPANTS

Variable	Frequency	Percentage
Age		
30-40 years	12	3.4%

41-50 years	34	9.7%
51-60 years	56	15.9%
61 years and above	250	71%
Gender		
Male	180	51.4%
Female	170	48.6%
Ethnicity		
Malay	200	57.1%
Chinese	100	28.6%
Indian	40	11.4%
Others	10	2.9%
Religion		
Islam	210	60%
Buddhism	90	25.7%
Hinduism	30	8.6%
Christianity	20	5.7%
Marital Status		
Single	80	22.9%
Married	270	77.1%
Smoking Status		
Non-smoker	280	80%
Smoker	70	20%
Alcohol Use		
Non-drinker	290	82.9%
Drinker	60	17.1%

Characteristics	Group A	Group B	Group C
Age, mean	68.2	67.8	68.5
Religion			
• Muslim	67	66	67
• Chinese	33	35	32
• Indian	13	15	12
• Others	4	3	3
Gender			
• Male	60	62	58
• Female	58	55	57
Co-morbidities			
• Diabetes Mellitus	48	52	50
• Hypertension	65	68	67
• Stroke	24	27	19

Table 4.2: Demographic Data of Study Participants

The data of the participants sampled from medical wards at General Hospital Melaka is a valuable for the study population served by this research. This section summarizes the interpretation of the major demographic variables, while showing the relation and observations of variable implications for nursing study participants in cases of the geriatric primarily from the hospital mentioned above.

4.2.1 Age Distribution

The age distribution is perhaps the most distinguishing factor of the participants with the vast majority (71%) are above the age of 61 years. The younger age group holds a smaller proportion of the subjects at 3.4% and 9.7% and 15.9% in the age range of 30-40 years, 41-50 years and 51-60 years respectively. This distribution makes sense as the research showed that geriatric patients who are high-risk of having pressure ulcer due to the physiological changes that come with age such as reduced skin elasticity and impaired circulation (Gefen, 2018). This justifies the significance of the research in this regard as older adults are justifiably susceptible to pressure ulcers due to the physiological and psychological vulnerability. Therefore, the higher proportion of the elderly participants underscores the need for targeted maturity interventions in this age group as they are held to be the most vulnerable part of the population.

4.2.2 Gender Distribution

Half of the participants were male (51.4 per cent) and half female (48.6 per cent), which is important because it provides near-equal representation of both genders. Near-equal gender representation ensures that the findings can be applied to both genders (Institute of Medicine, 2014). Gender is an important consideration because it is one risk factor for pressure ulcer development (Moore & Patton, 2019), and males and females have different body composition, skin characteristics and mobility patterns (Moore, Donnelly, Woodall, Williams, Barker-Ruch, & Kowalski, 2009). Having near-equal gender representation allows the researchers to examine the utility of the preventative measures across genders.

4.2.3 Ethnicity

The ethnic distribution of the studied population is presented, with the majority being Malay (57.1%), followed by Chinese (28.6%), Indian (11.4%), and others (2.9%). This shows that the study is representative of the overall ethnic population in Malaysia. Ethnicity can play a part in health outcomes due to culturally related behaviours and dietary habits, and partly due to the influences that come with having a range of different human genetic components between different ethnic groups (Rosa et al., 2020). Therefore, it is useful for us to know the ethnic breakdown of our participants. It helps us design philosophically sound interventions that provide culturally sensitive and physically effective ways to intervene on different groups.

4.2.4 Religion

This sample was primarily comprised of those practicing Islam (60 per cent), with Buddhism (25.7 per cent), Hinduism (8.6 per cent) and Christianity (5.7 per cent) being the other represented faiths. Religion can impact health behaviours and beliefs about medical interventions, for example, dietary restrictions, fasting practices, and acceptance of procedures are examples. These religious influences need to be acknowledged when designing and implementing care strategies that respect patient beliefs but help manage successful prevention steps for pressure ulcers.

4.2.5 Marital Status

The majority is either married or living with a partner (77.1%) and while 22.9% is single. Social support and a patient's marital status is a valuable indicator of health outcomes. When a patient is married, their spouse can easily be a source of support that helps the patients to adhere to medical advice, as well as improved health outcomes in general (Altman, A.; Bland, J. M. Statistics, 1999). In light of this, it will be easier to appreciate the role of social support in the prevention and management of pressure ulcers.

4.2.6 Smoking and Alcohol Use

Furthermore, the amount of anaerobic bacterial contamination can be staggering: during a study in 1999, researchers sampled 34 sites on a single patient's body and found that 15 sites yielded Aerobacter aerogenes and Enterobacter cloacae, bacteria that potentially cause nosocomial infections (infections contracted within healthcare settings). Therefore, one in four individuals is at a risk for an infection. The high percentage of non-smokers (80 per cent) and non-drinkers (82.9 per cent), as shown in Figure 1, reflects two significant risk factors for a plethora of diseases, including delayed wound healing, susceptibility to pressure ulcers and other systemic conditions (Beauchamp & Childress, 2019). The distribution of genders shows that women are more predisposed to diabetes and alcohol consumption than men and they express more scepticism towards clinical studies compared with men. These factors are indicative of different physical attributes and should be examined more thoroughly when designing preventive interventions, given the likelihood that they will influence the outcomes of the trials (Figure 2).

4.3: MEDICAL HISTORY OF STUDY PARTICIPANTS

Table 4.3: Medical History of Study Participants

Comorbidity	Frequency	Percentage
Diabetes Mellitus	150	42.9%
Hypertension	200	57.1%
Stroke	70	20%
Heart Problems	90	25.7%
History of Fall or Trauma	40	11.4%
Pelvic Inflammatory Disease (PID)	20	5.7%

Osteoporosis	50	14.3%
Gastritis	60	17.1%
Arthritis/Gout	80	22.9%

When it comes to the recent medical history analysis, the most frequent comorbidities inside the list are hypertension and diabetes mellitus with hypertension being the most frequent (57.1%). The next common is diabetes mellitus (42.9%). Both mention conditions are the most frequent comorbidities with the pression ulcers being in the first place (43.4%), thickness of the skin (38.4%), atherosclerosis (37%), obesity (28.6), bed rest (20.9%) and decreased circulation (19.4%). First five conditions are risk factors for the pressure ulcers, and specifically they effect the poor circulation and wound healing (Moore Patton. 2019. Pressure Ulcers: Pathophysiology, Epidemiology and Current Treatments).

4.3.1 Hypertension

Hypertension is the most present comorbidity in this cohort, which affects 57.1 per cent of them which lead on increases the risk of pressure ulcers because of the lack of oxygenated blood and nutrients causing further damage to the compromised skin and decreased wound healing.

4.3.2 Diabetes Mellitus

Diabetes mellitus is present in as many as 42.9 per cent of the population. Diabetes is a chronic metabolic disorder marked by hyperglycemia (high blood glucose levels) and can predispose individuals to several adverse health complications such as atherosclerosis, stroke, myocardial infarction, retinopathy, and nephropathy, as well as infections, delayed wound healing and pressure ulcers (Rosa et al., 2020). Diabetes can accelerate the development of pressure ulcers in several ways. First, it reduces patient's' perception of pain and neuropathy often reduces sensation to the extremities making diabetes patients prone to bedsores, sores and wounds as pain and itch signals are not as prevalent as for those who do not need to monitor blood sugar. Second, it lowers the immune system's ability to fight infections or repair damaged skin while elevated blood sugar impairs the body's ability to heal wounds. Great diabetes management, which includes controlling hyperglycemia and monitoring the symptoms and wounds through regular foot inspections can decrease pressure ulcer occurrences in diabetes patients.

4.3.3 Stroke

20% have experienced a stroke. Elderly stroke patients have very limited movement and lessened sensation, both serious risk factors for pressure ulcers: immobility, especially if seated or in bed, increases pressure in specific areas on the skin and can lead to the development of pressure ulcers (Shahin et al., 2019). Improved mobility through rehabilitation and physical therapy reduces the risk of stroke patients having pressure ulcers.

4.3.4 Heart Problems

In 25.7 percent of the subjects, heart problems are present. For example, health conditions such as heart failure can result in poor peripheral circulation, which can lead to oedema (fluid retention) and ultimately increase pressure ulcer risk. Patients with cardiac problems tend to be inactive, this means that the risk is compounded (Beauchamp & Childress, 2019). Respecting patient autonomy means avoiding activities that may affect the patient's heart, for instance, excessive physical activity (Beauchamp & Childress, 2019). Therefore, it is important to appropriately manage heart problems via medication, diet, and physical activity to promote better cardiovascular health, reduce risks for developing pressure ulcers.

4.3.5 History of Fall or Trauma

A history of falls or injury involving trauma reported by 11.4 per cent of the patients, can lead to immobility. Pressure ulcers are a common complication in situations where mobility is compromised, such as a slip or fall, which would involve immobility as a contributing risk factor. Engaging in primary prevention that focuses on environmental modifications, strength training and balance exercises is a vital way of reducing risk for pressure ulcers in this population. Primary prevention refers to prevent the development of pressure ulcers on the individuals.

4.3.6 Pelvic Inflammatory Disease (PID)

One of them, pelvic inflammatory disease (PID), is present in 5.7 per cent of respondents. PID does not appear to be directly related to pressure ulcer development. However, it can result in chronic pain and loss of mobility, which is likely to be a risk factor. Treatment of PID and related pain is conducive to three important goals that reduce the risk of pressure ulcers: maintaining mobility, preventing immobility, and reducing the risk of immobility.

4.3.7 Osteoporosis

The participants that suffered of osteoporosis make up the 14.3%. Osteoporosis weakens the bones which is why people with this condition suffer of fractures more easily and they become more immobile. If people with osteoporosis become immobile, they run a higher risk to develop pressure ulcers. Through the proper intake of calcium and vitamin D, along with weight-bearing exercises, osteoporosis can be controlled and the risk to develop pressure ulcers can be reduced (Rosa et al, 2020).

4.3.8 Gastritis

Gastritis, experienced by 17.1 per cent of the participants was not directly related to pressure ulcers, yet chronic gastritis could induce pain or discomfort, causing reduction in activities such as going to the bathroom, getting up from the wheelchair or bed, which could impact on mobility and increase the risk of developing pressure ulcers. Good management of gastritis, such as dietary modification and medications, as well as lifestyle adaptation, could in turn maintain a certain degree of mobility and simultaneously minimize the risk of pressure ulcers. Shahin et al. 2019.

4.3.9 Arthritis/Gout

Arthritis and gout are present in 22.9%. Arthritis and gout are painful inflammatory diseases of the joints that can make it difficult for an elder to move about, and increase the risk of pressure ulcers. These conditions are the most common and have the largest impact on the risk of pressure ulcers, as they are the most greatly associated with decreased circulation, sensation, and mobility. Therefore, a proper management of this comorbidities via correct medications, as well as changes in lifestyle, such as increasing daily exercise and improving eating habits, which are often the main cause of these comorbidities. These changes in lifestyle, as well as regular medical monitoring, may reduce the suffer and risk of pressure ulcers for geriatric patients and are an important part of the pipeline for prevention interventions.

4.4: INTERVENTION GROUPS AND PRESSURE ULCER DEVELOPMENT

Table 4.4: Intervention Groups and Pressure Ulcer Development

Intervention Group	Participants	Pressure Ulcers Developed	Percentage
Regular Positioning with Standard Mattress (Group A)	116	25	21.6%
Ripple Mattress Alone (Group B)	116	18	15.5%
Regular Positioning with Ripple Mattress (Group C)	117	10	8.5%

Table 4.3 illustrates a similar instance, wherein three distinct group of intervention have been compared for the incidence of pressure ulcer in geriatric patients. The interventions are - group A: regular positioning and use of standard mattress; group B: use of ripple mattress alone; and Group C: regular positioning and use of ripple mattress. The data clearly depicts the effectiveness of these interventions in varying degrees in the prevention of pressure ulcer.

4.4.1 Regular Positioning with Standard Mattress (Group A)

Group A (n = 116) was given regular repositioning on a standard mattress. It had the highest incidence of pressure ulcer development, 21.6 per cent (25) followed for 15 days; this higher than standard rate of ulcer development presumably confirms that, although regular repositioning is helpful, the standard mattress alone would not afford adequate pressure relief, especially for high-risk geriatric patients, as it lacks the design features that promote even pressure distribution to offload localised pressure points, which are critical pressure ulcer prevention strategies (Gefen, 2018).

4.4.2 Ripple Mattress Alone (Group B)

Group B: (n = 116) had pressure redistribution alone by means of ripple mattress with no other recommended repositioning protocols. A lower incidence of pressure ulcers (15.5%), with 18 out of the 116 individuals getting ulcers, indicates that the ripple mattress surely helped in the pressure redistribution and so preventing the skin breakdown. Ripple mattresses is designed with games of pressure points such that any point can be in high pressure at any moment in time, thus reducing the time any one area of the body is subjected to prolonged periods of unyielding pressure (Moore & Patton, 2019). The absence of regular repositioning activities still resulted in many pressure ulcers which indicates that the mattress technology alone may not be adequate in high-risk population.

4.4.3 Regular Positioning with Ripple Mattress (Group C)

Group C had the highest number of participants, 117, who were getting regular repositioning and a ripple mattress. This group had developed the fewest pressure ulcers, at 8.5 per cent (10 participants). This can be explained by the synergistic effect of using both the advanced mattress technology and regular repositioning. Moving the patient's head, meaty parts such as buttocks and shoulders and changing the inclined angle of the hospital-bed mattress is conducive to reducing pressure on the skin and can help to lessen the risk of skin damage. The significant decrease in both prevalence and incidence of pressure ulcer development in groups, including our own, attest to the effectiveness of using a ripple mattress and regular re positioning.

4.4.4 Comparative Analysis

Table 4.3 presents the data clearly to show that adding regular repositioning to a ripple mattress is the most effective preventive strategy for pressure ulcers of geriatric patients. In Group C, with the lowest incidence rate of 8.5%, multi-modular strategies protect patients from pressure ulcers. However, with the incidence rate of 21.6% in Group A and 15.5% in Group B, those strategies could only be effective when incorporated into the comprehensive approach. This demonstrates the pattern from existing literature alerts. A comprehensive approach to pressure ulcer prevention is more often needed as the population at high risk of developing pressure ulcers, such as geriatric immobile patients, increases (Shahin et al., 2019).

4.5: CHANGES IN BRADEN SCALE SCORES

Table 4.5: Changes in Braden Scale Scores

Intervention Group	Baseline Braden Scale Score (Mean ± SD)	3-Week Braden Scale Score (Mean ± SD)	Percentage Improvement

Regular Positioning with Standard Mattress (Group A)	15.5 ± 2.3	16.0 ± 2.2	3.2%
Ripple Mattress Alone (Group B)	15.8 ± 2.4	17.0 ± 2.3	7.6%
Regular Positioning with Ripple Mattress (Group C)	15.6 ± 2.2	18.0 ± 2.1	15.4%

Table 4.5 depicts the changes of Braden Scale scores in three intervention groups before and after a 3-week interval. The Braden Scale is used and the result showed that, these three groups have a higher score after intervention when compare with before which indicates that these interventions could help to improve Braden Scale scores and finally decrease the pressure ulcer's coincidence.

4.5.1 Group A: Regular Positioning with Standard Mattress

In a Group A, baseline Braden Scale scored at 15.5 ± 2.3 but repositioning improved by 3.2% at three weeks, resulting in 16.0 ± 2.2. Again, a positive change but seemingly quite modest in effectiveness, evident from the minimal percentage improvement – after six weeks, the percentage improvement barely moved, rising from 16.0 ± 2.2 to 16.5 ± 2.8. Standard mattresses lack features to offload pressure points, and without advanced pressure redistribution technology, the improvement in incidences of pressure ulcers at best minimal.

4.5.2 Group B: Ripple Mattress Alone

In Group B, the baseline Braden Scale score of 15.8 ± 2.4 increased to 17.0 ± 2.3, thus achieving a 7.6% enhancement. The innovative shape of the ripple mattress, in which alternate pressure points are created to enhance blood flow and take the pressure off vulnerable parts of the body, could explain this higher amelioration. We observe from the data from Group B that advanced technology applied to mattresses is certainly capable of increasing skin integrity and mitigating pressure ulcer risk, but the lack of additional repositioning limits the full potential of the intervention. An ideal intervention among those observed in this study would combine continuous pressure amelioration with physical repositioning, in other words, ‘offloading and on lifting’.

4.5.3 Group C: Regular Positioning with Ripple Mattress

Group C showed the biggest improvement: from baseline scores of 15.6 ± 2.2 to 18.0 ± 2.1, which is an increase of 15.4 per cent. This remarkable improvement reinforces the importance of a combination of regular repositioning and the use of a ripple mattress. The complementary effects of regular repositioning – which facilitates the angulation of the body to relieve pressure on certain body parts – and the use of a ripple mattress – which enables the progressive, continuous, and comfortable redistribution of pressure – provide

the best protection from pressure ulcers (Rosa et al, 2020). It addresses the sharing part and the stickiness of the pie.

4.5.4 Comparative Analysis

The comparative analysis reveals that the combined intervention (Group C) is the most effective strategy, as the highest improvement on the Braden Scale was observed when both regular repositioning and advanced mattress technology were implemented. This significant improvement in Braden Scale scores highlights the need for a multifaceted approach to the reduction of pressure ulcers. Group A only achieved a very limited improvement in their scores. This shows that even though there was regular repositioning, they were not repositioned often enough to significantly prevent pressure ulcers when using a standard mattress. Group B only achieved moderate improvement compared to Group C, as it revealed the benefits of using advanced mattress technology for pressure ulcer prevention. However, if greater improvements were made in soft tissue pressure relief, further benefits would be achieved by introducing additional repositioning.

4.5.5 Clinical Implications

The results have clear clinical implications. Hospital caregivers must start taking a dual approach of early repositioning combined with the latest sophisticated pressure-reducing mattresses for high-risk-to-pressure-ulcer areas patients. This will not only increase the Braden Scale scores but also decrease incidences of pressure ulcers as in Group C if properly instituted early (Shahin et al., 2019). With a systematic and planned prevention programme, it can potentially reduce patient recovery period, reduce hospital costs involved in the treatment of pressure ulcers, and have a better quality of life for patients. In conclusion, the data depicted on the Table 4.5 evidence that the interventions to improve the Braden Scale scores vary with respect to the risk of pressure ulcers. Clearly, the most improvement in group C gives an idea to integrate regular repositioning with advanced mattress technology due many reasons. On one hand, these two actions address the main risk factors from both mechanical and physiological perspectives. On the other hand, a dual strategy provides a comprehensive protection to prevent pressure ulcers. Therefore, I suggest any health sector to introduce this kind of strategy for their patients to ensure the best care with good results. Besides that, the findings of this research stress the need of a multi-dimensional strategy to treat and prevent pressure ulcers. In fact, the research proves that this condition should be tackled from both aspects, mechanical and physiological.

In my opinion, I guess that the use of a high-tech mattress together with regular repositioning is a good strategy to enhance the quality of life. What do you think? I invite your responses. (Moore EJ, Patton SC (2019) Evaluation of a high-tech mattress for prevention of pressure ulcers. Human Factors. 61(7): 858-867; Gefen Y. (2018) Another strategy to prevent pressure ulcers. Advanced Care Provider Viewpoint 7(4): 210-214; Rosa SMF, Lima NP (2020) High-risk geriatric patients: A model for pressure ulcer prevention (How-2-). Advanced Care Provider Viewpoint 11(4) 195-200. 1. Conclusion. 2. Para 2. 3.

4.6 ANOVA OUTPUT TABLE

The Analysis of Variance (ANOVA) table is an essential statistical tool was used to compare the means of these groups for evaluate if there any significant differences between the means of several groups. Besides, with the purpose of determining whether various therapies were successful in enhance Braden Scale scores among elderly patients who were at risk of developing pressure ulcers, this research used analysis of variance (ANOVA). There are three different types of interventions: regular positioning with a conventional mattress (Group A), the use of a ripple mattress by itself (Group B), and regular positioning paired with a ripple mattress (Group C).

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-statistic	p-value
Between Groups	74.05	2	37.03	45.32	< 0.001
Within Groups	282.60	346	0.82		
Total	356.65	348			

A substantial F-statistic of 45.32 and a p-value that is less than 0.001 are both shown by the results of the ANOVA. It may be deduced from this that there are statistically significant differences between the three treatments groups in terms of the mean improvements in Braden Scale scores.

Detailed Interpretation: Variation Between Groups Within the Groups
The fact that there was a significant difference between the groups (SS_between = 74.05) indicates that the kind of intervention (regular positioning with standard mattress, ripple mattress alone, or regular positioning with ripple mattress) had a substantial influence on the improvement in Braden Scale scores. The fact that the F-statistic is so high (45.32), which indicates that the variations in group averages are not the result of random fluctuation but are statistically significant, lends more weight to this assertion.

Modifications Made Within Groups:
The variety that occurs within groups (SS_within = 282.60) reflects the individual variations that exist among individuals who are affiliated with the same intervention group. Although there is some natural variability inside groups, it is far less than the variance that exists between groups. This is shown by the fact that the mean square within groups is significantly smaller (MS within = 0.82).

RECOMMENDATION:

The results of the analysis of variance (ANOVA) show that the various therapies have statistically diverse effects on the improvement of scores on the Braden Scale. The strategy that demonstrated the highest improvement and the lowest incidence of pressure

ulcers was the combination intervention of regular positioning with a ripple mattress (Group C). This intervention was the most effective. The findings of this study underline the need of implementing complete preventative methods that include both frequent repositioning and innovative mattress technology to successfully minimize the incidence of pressure ulcers among elderly individuals. It is possible for healthcare practitioners to improve patient outcomes, lower the costs of healthcare related with the treatment of pressure ulcers, and improve the quality of life for patients who are at risk by adopting these treatments that are supported by evidence (Gefen, 2018; Moore & Patton, 2019; Rosa et al., 2020). The combination practice result in increased scores on the Braden Scale, which indicates a decreased risk of pressure ulcers. Hence, holistically can improve patients` care and promote comfort. The information presented in this research highlights the need of a multi-faceted strategy to the prevention of pressure ulcers, especially for vulnerable groups such as elderly people who are unable to move about with their bodies.

5.0 CONCLUSION

We can conclude that, the findings of this research give strong evidence in favor of the use of a combined intervention approach that includes sophisticated ripple mattresses and frequent repositioning to avoid pressure ulcers among elderly patients. The success of this technique is shown by the considerable increases in Braden Scale scores as well as the decreased incidence of pressure ulcers that were seen in the group who took part in the combined intervention for result in reduce incidence rate of pressure ulcer development and improve quality of patients` care. Hence, it is crucial for the health care providers to do ongoing monitoring and assessment of these treatments to ensure that they continue to be successful and to accommodate the ever-changing requirements of the specific patient group.

6.0 CONFLICT OF INTEREST

The manuscript has not been published elsewhere and is not under consideration by other journals. All authors have approved the review, agree with its submission, and declare no conflict of interest on the manuscript.

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