



## Effectiveness of Prophylactic Sacral Care on Prevention of Pressure Ulcer among Pressure Ulcer High-Risk Patients in the Intensive Care Unit

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### ABSTRACT

Patients in intensive care units are usually at high risk of mortality, not only from their illness but also from a secondary complication such as pressure ulcer. Problems of the integumentary system are common can be severe. It can present itself as a life-threatening condition. A pressure ulcer is a restricted physical issue to the skin as well as fundamental tissue as a rule over a noticeable hard quality, because of pressure or pressure in blend with shear. The newer treatment modalities of cancer for the treatment of pressure ulcers incorporate the function of nourishment, pressure-discharge gadgets, for example, pads and sleeping cushions, cleaning the injury, debridement, streamlined dressings, part of anti-toxins and reconstructive medical procedure as an aspect of the therapy calculation for forestalling and fast recuperating cycle of these injuries. Hence the study aims to assess the effectiveness of prophylactic sacral care on prevention of pressure ulcer among pressure ulcer high-risk patients in the experimental and control group. A quasi-experimental design was employed with 60 samples which matched the inclusion criteria were selected by convenience sampling technique. Demographic variables data were collected by using a structured questionnaire followed by assessing the effectiveness of prophylactic sacral care on prevention of pressure ulcer among pressure ulcer high-risk patients by using the questionnaire. The findings of the study revealed prophylactic sacral care could significantly reduce the risk of pressure ulcer. Based on findings, further studies can be conducted to correlate the pre-test and post-test score of prevention of pressure ulcer among pressure ulcer high-risk patients between the experimental and control group.



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### INTRODUCTION

Patients in intensive care units are usually at high risk of mortality not only from their illness but also from a secondary complication such as pressure ulcer (Kolarsick *et al.*, 2011). The Fourth National Pressure Ulcer Prevalence Survey found a yearly medical clinic pervasiveness pace of 10.1%. In the drawn-out consideration setting, frequency and predominance rates have extended from 3% to 30%. Less is thought about weight ulcers in-home consideration, yet examines have revealed rate paces of 4% to 15% and predominance paces of 5% to 15% (Haesler, 2014). A weight ulcer is a limited

physical issue to the skin as well as basic tissue typically over a hard unmistakable quality, because of weight or weight in blend with shear (Bhattacharya and Mishra, 2015). Various contributing or perplexing variables are related to pressure ulcers; the criticalness of these components is yet to be explained.

Edsberg *et al.* (2016) revised National Pressure Ulcer Advisory Panel Pressure Injury Staging System: The newer treatment modalities of cancer for the treatment of weight ulcers incorporate the function of sustenance, pressure-discharge gadgets, for example, pads and sleeping pads, cleaning the injury, debridement, enhanced dressings, part of anti-toxins and reconstructive medical procedure as an aspect of the therapy calculation for forestalling and fast mending cycle of these wounds (Edsberg *et al.*, 2016). Studies expressed that with ongoing years various prescriptions are being used for relieving the weight ulcers, for example, Gelatin items, Debrisan, Aluminum containing anteriorids (alterngel), Povidone-iodine, Insulin Honey, Polyurethane cement, Anti-microbial powder (Lowe, 2009).

Lowe (2009) stated that preventing the occurrence of pressure ulcer and to keep it away from skin breakdown that can be achieved through ventilation and warming, light, skin assessment techniques, managing pressure points and bed and bedding, personal cleanliness, observation the skin of obese patients, frequent repositioning and turning, proper lifting patients, use of emollients and moisturisers, moisture-wicking pads, Support surfaces, nutrition goals. However, a frequency and commonness of pressure ulcers contrast incredibly, contingent upon the setting. In the medical clinic, frequency rates have run from 1% to 30%. Higher rates are noted in serious consideration units, where patients are less versatile and have severe foundational diseases (Zanaty *et al.*, 2017).

Aloe Vera is an excellent blend of more than 200 constituents, including polysaccharides (an intricate sugar), chemicals (complex proteins), glycoproteins, amino acids, nutrients and minerals which assists with lessening irritation, speed the recuperating of wounds, enhance torment, improve vascular stream, and diminish scarring (Baghdadi *et al.*, 2020). Aloe Vera Gel seems to apply its calming movement through Brady kinase action and thromboxane B2 and prostaglandin F2 restraint (Kusmardi *et al.*, 2019). Aloe Vera is a very potent herb known for its skin-soothing, anti-inflammatory as well as antibacterial activity. It heals skin condition, moisturises and improves the elasticity of the skin, it also hydrates dry skin area without leaving

oily or shiny. The directions for using gel, take a little aloe Vera gel onto the palm, apply on the sacral region by a slow, circular motion for maximum penetration and apply whenever needed to prevent drying (Buzzi *et al.*, 2016).

Aloe Vera has been utilised generally to improve wound recuperating and contains a few constituents that might be significant for this impact. Aloe Vera is worldwide perceived as anti-microbial, antiviral, antibacterial, and antifungal. It is useful in the prevention and management of pressure ulcers as it stimulates and accelerates the healing process. The establishment of non-pharmacological preventive measures and remedies using aloe Vera in prevention and treatment of pressure ulcer recommended (Byrne *et al.*, 2016). However, as an application of aloe Vera gel over sacral region enhances the patient satisfaction and health care providers time-consumption.

## MATERIALS AND METHODS

The research approach used in the study was a quantitative approach by using non-probability, convenient sampling technique. The study was conducted after obtaining formal permission from hospital authority with 60 samples at an intensive care unit. Samples who matched the inclusion criteria were selected by convenience sampling technique. Samples who were not willing to participate in the study, pre-existing sacral pressure ulcer, skin infections over the sacral region excluded from the study. The participants, who consented for willing to participate were informed about the purpose of the study and obtained informed consent. The interview method was used to collect the demographic variables followed by the Norton scale assessment on one to one basis for prediction of pressure ulcer development. This questionnaire consists of five classes like physical condition, mental condition, activity, mobility, incontinent. Following this, Barbara Braden and Nancy Bergstrom Scale for prediction of pressure ulcer risk. The six subscale scores such as sensory perception, moisture, activity, mobility, nutrition, friction and shear. The Braden Scale is a standardised pressure ulcer assessment scale has a well-established reliability of 0.84. Confidentiality and anonymity were maintained throughout the procedure. Collected data were analysed by using descriptive and inferential statistics.

## RESULTS AND DISCUSSION

The study findings are in the experimental group, majority 10(33.3%) were in the age group of 21

- 30 and 51 - 60 years, 30(100%) were male, 17(56.7%) belonged to joint family, 24(80%) were non-vegetarian, 10(33.3%) had taken fluid in the range of 750ml - 1000 ml/day, 14(46.7%) had to feed through a nasogastric tube, 10(33.3%) had been staying in ICU for two days to seven days and seven days to fifteen days respectively, and 18(60%) had no other co-morbidities. Whereas Table 2 in the control group, majority 10(33.3%) were in the age group of 51- 60 years, 29(96.7%) were male, 18(60%) belonged to joint family, 23(76.7%) were non-vegetarian, 8(26.7%) had taken fluid in the range of 1000ml - 1500ml/day and 750ml - 1000 ml/day, 12(40%) had feeding through a nasogastric tube, 15(50%) had been staying in ICU for two days to seven days, and 19 (63.3%) had no other co-morbidities.

A detailed analysis was done in the present study in assessing the effectiveness of prophylactic sacral care on prevention of pressure ulcer. The Table 1 shows that the pre-test score of risk of pressure ulcer was  $11.63 \pm 1.45$  and the post-test score was  $13.33 \pm 1.84$ . The mean difference score was 1.70. The calculated paired 't' value of  $t = 5.527$  was found to be statistically significant at  $p < 0.001$  level which infers that there were significant improvements in the post-test score of preventing pressure ulcer after prophylactic sacral care among pressure ulcer high-risk patients in the experimental group (Table 1).

The Table 2 shows that the pre-test means the value of the risk of pressure ulcer in the experimental group is lower than the control group. In contrast, the post-test mean value of the risk of pressure ulcer in the experimental group is higher than the control group. In the pre-test, Unpaired 't' test value of  $t = 3.537$  was found to be statistically significant, which shows there was a significant difference between the experimental and control group. Whereas in the post-test, Unpaired 't' test value of  $t = 2.588$  was found to be statistically significant which shows that prophylactic sacral care among pressure ulcer high-risk patients in Intensive care unit was found to be effective in preventing pressure ulcer in the experimental group than the control group.

The management of pressure ulcer high-risk patients is complex to plan for proper care. The primary and ideal responsible for nurses assessing the sacral region to provide effective nursing care to avoid pressure ulcer and promote the well-being of the patients on high-risk of pressure ulcer. Standardising the procedure for assessment of pressure ulcer by Norton Scale and Braden Scale is crucial to evaluate whether the pressure ulcer is moving towards desired outcomes.

The present study findings revealed that the prevalence of risk of pressure ulcer assessment of Norton scale without the intervention of prophylactic sacral care on pressure ulcer high-risk patients. In the experimental group, 93.3% of participants had a high risk of pressure ulcer, and 6.7% of participants had a very high risk of pressure ulcer. But in the control group, 83.3% of participants had a high risk of pressure ulcer, and 16.7% of participants had a very high risk of pressure ulcer (Figure 1).

Present study findings supported by the study conducted by Fulbrook *et al.* (2019) on prophylactic sacral protective dressings. The purpose of the study to find out the effectiveness of prophylactic sacral care to prevent pressure injury incidence with an overall relative risk indicating that the intervention decreases pressure injury risk by 70% (Fulbrook *et al.*, 2019). The study has revealed statistically significant reduced pressure injury incidence in the intervention group.

In the experimental group, during the pre-test Braden scale assessment of the risk of pressure ulcer, 83.3% of participants had a mild risk of pressure ulcer, 10% of participants had no risk, and 6.7% of participants had a moderate risk of pressure ulcer. Whereas in the post-test Braden scale assessment of the risk of pressure ulcer, 36.7% of participants had a high risk of pressure ulcer, 33.3% of participants had moderate risk, and 30% of participants had a mild risk of pressure ulcer among patients in the experimental group (Figure 2)

The present study findings supported by Sari *et al.* (2018), who concluded the topical treatment by Nigella sativa oil gel Vs aloe Vera gel on wound healing. The study was aimed to investigate and compare the effectiveness of Nigella sativa oil gel and aloe Vera gel for the topical treatment of wound healing in a diabetic ulcer. The wound areas on days 6 and 7 were significantly smaller in the aloe Vera gel group than in the Nigella sativa oil gel group. Re-epithelialisation was also better in the aloe Vera gel group than in the other group (Sari *et al.*, 2018). Hence it is concluded that the aloe Vera gel application showed the difference between the experimental and control group. Hence the stated research hypothesis was accepted.

The pre-test means a value of the risk of pressure ulcer in the experimental group is lower than the control group by unpaired 't' test which clearly shows there was a significant difference between the experimental and control group. Whereas the post-test mean value of the risk of pressure ulcer in the experimental group is higher than the control group by unpaired 't' test which shows that pro-

**Table 1: Comparison of pre-test and the post-test score of risk of pressure ulcer among patients in the experimental group**

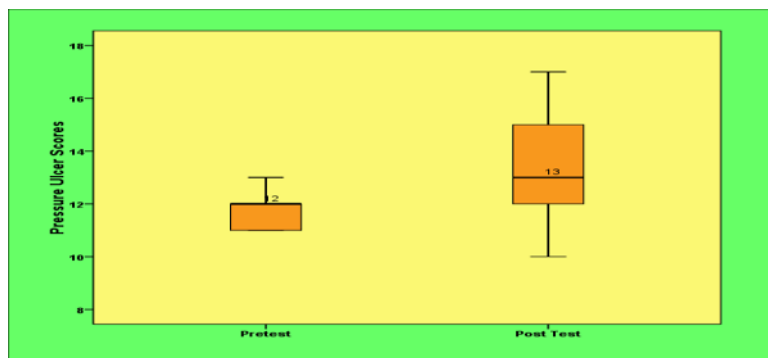
Risk of Pressure Ulcer	Mean	S.D	Mean Difference	Paired 't' Test
Pre-test	11.63	1.45	1.70	t = 5.527
Post Test	13.33	1.84		P = 0.0001 S***

\*\*\*p<0.001, S -Significant

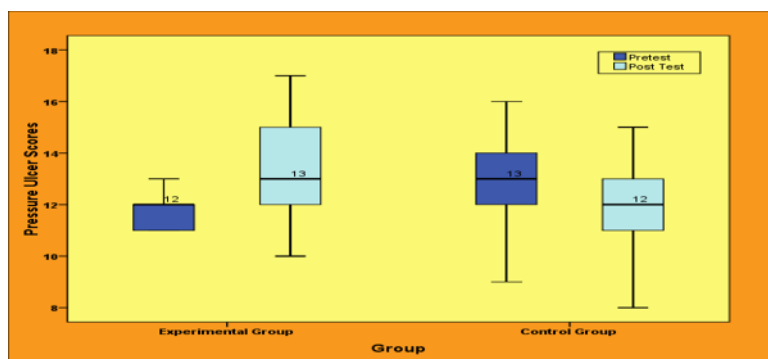
**Table 2: Comparison of pre-test and the post-test score of risk of pressure ulcer among patients in the control group**

Risk of Pressure Ulcer	Mean	S.D	Mean Difference	Paired 't' Test
Pre-test	13.13	1.81	0.96	t = 5.706
Post Test	12.17	1.64		P = 0.0001 S***

\*\*\*p<0.001, S -Significant



**Figure 1: Box plot showing the comparison of pre-test and the post-test score of risk of pressure ulcer among patients in the experimental group**



**Figure 2: Box plot showing the comparison of pre-test and the post-test score of risk of pressure ulcer among patients between the experimental and control group**

phylactic sacral care among pressure ulcer high-risk patients in Intensive care unit was found to be effective in preventing pressure ulcer in the experimental group than the control group.

The present study findings supported by [Al-Niarat and Alshraideh \(2019\)](#) who concluded the topical agent on bony prominences aimed to prevent pressure ulcer for hospitalised adults who are at risk to develop a pressure ulcer. Aloe vera gel vs stan-

dard care up shown better outcomes in the prevention of pressure ulcer among intervention group in comparison with the control group. Results have shown a significant effect to prevent pressure ulcer among intervention group who at risk to develop a pressure ulcer. It was concluded that the aloe Vera gel application would prove beneficial in preventing pressure ulcer, cost-effectiveness and easy availability ([Al-Niarat and Alshraideh, 2019](#)). This indicates

that the aloe Vera application to the pressure ulcer high-risk patients in the experimental group was found useful on the prevention of pressure ulcer. Hence the stated hypothesis was accepted.

The demographic variable age of the patients had shown statistically significant association with post-test scores of risk of pressure ulcer at  $p < 0.05$  level and the other demographic variables had not shown statistically significant association with post-test scores of risk of pressure ulcer among patients in the experimental group. The demographic variable comorbidities had shown statistically significant association with post-test scores of risk of pressure ulcer at  $p < 0.001$  level and the other demographic variables had not shown statistically significant association with post-test scores of risk of pressure ulcer among patients in the control group. This study supported by (Hekmatpou *et al.*, 2018), who revealed that the sacrum is highly associated with the post-test level of prevention of pressure ulcers.

## CONCLUSION

The study findings concluded that prophylactic sacral care shows effectiveness in preventing pressure ulcer among pressure ulcer, high-risk patients. Based on the current study findings, further studies can be conducted to correlate the post-test score of risk of pressure ulcer with selected demographic variables among pressure ulcer high-risk patients in the experimental and control group.

## Conflict of Interest

The authors declare that there is no conflict of interest for this study.

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