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A Study to Assess the Effectiveness of Water Glove Application on Risk Reduction of Heel Ulcer among Bedridden Patients at Selected Hospitals of Bagalkote

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Abstract | **Original Research Article**

***Background*:** Alteration from health on severe basis leads to hospitalization, which will be painful and traumatic. Sometimes the treatment will heal the disease but the complication arises from the hospitalization leads to severe trauma. Commonly seen among bedridden patients are pressure sore where the bony prominences which leads for necrosis. ***Methods*:** A True Experimental Pre-test Post Test control group research design, was used for present study60 hospitalized patients who are bedridden were selected by purposive sampling method and divided into two groups. Experimental group (n=30) received water glove application in experimental and Control group (n=30) were on a routine treatment. The data was analysed by using descriptive and inferential statistics. **Results:** Findings of the study revealed that the mean and SD post test score of Braden pressure ulcer risk assessment score in experimental group was 18.9± 1.863441, and in the control group the post-test mean score and SD was 10.86± and 1.382984, with the Independent 't' value of t=18.9 .and the mean difference is 8.04 .so it is considered as significant. The independent T test calculated value (18.9) is more than the independent t test tabulated value (1.699). Hence the study revealed that the water glove application is effective. ***Conclusion*:** The study concludes that there was significant difference found between the two groups, therefore study showed that that water glove application was found to reduce the heel ulcer among bed ridden patients.

Keywords: Effectiveness, Braden Pressure Ulcer Risk Assessment, Water Glove Application, Socio-Demographic Variables.

INTRODUCTION

The meaning of health has evolved over time. In keeping on mind with the bio- medical perspective, early definitions of health main focus was on body's ability to function; health was seen as a state of normal function that could be deviated time to time by disease [1]. According to the World Health Organization, universally accepted definition was Health is "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity" [2]. Being bedridden is a type of immobility that can represent as an inability to move or even sit upright. It differs from bed-rest, a form of non-invasive treatment that is usually part of recovery or the limitation of activities. Some of the more serious consequences of being bedridden is the high risk of developing thrombosis and muscle wasting (atrophy) [3]. Heel pressure ulcers can cause significant morbidity and mortality. They should be anticipated and prevented in patients at risk for pressure ulcers. Preventing heel ulcers primarily involves the use of simple devices, like pillows and offloading device, to protect delicate heels [4]. Studies have shown that the overall Pressure ulcers prevalence in hospitalized patients was approximately 15%. In Brazil, this indicator tends to be higher, especially when it involves patients in intensive care, reaching the percentage of 57.9% [5]. Incidence of bedsore varies from 0.4 to 38.0% in major hospitals, 2.2 to 23.9% in those on long-term care and 0 to 17% in home care settings.1-4 Bedsores are associated with prolonged and expensive hospitalization [6]. Ulcers, wounds in the skin that can get infected and take a long time to heal, are sometimes found on feet and toes. People with diabetes who have neuropathy are most likely to get these ulcers. Ulcers can get infected and

sometimes require amputation of foot or toes. Healing the ulcer might include nonsurgical and surgical treatments. The most common sites are the Bottom of foot, Toes, Side of the foot [7].

MATERIALS AND METHODS

Research approach quantitative research approach. The present study is True Experimental Pre-Test, Post-Test with Control Group Design. A purposive sampling technique were used to select of 60 bedridden patients through randomization of subjects to the experimental and control group with the help of simple random sampling technique by lottery method from General and ICU wards, HSK Hospital Bagalkot. Written consent was taken from participants for the study. Self-structured questionnaires for Socio demographic variables, Standardized Braden Pressure Ulcer Risk Assessment Scale were used as tool for data collection. The data was analyzed by using descriptive and inferential statistical.

Study Design: The study design adopted for this study was True Experimental Pre-Test, Post-Test with Control Group Design.

Setting of the Study: The present study was conducted at General and ICU wards at BVVS HSK Hospital and Research Centre, Bagalkot.

Participants:

In the present study participant were the bedridden patients who are having risk of heel ulcer who are admitted general and ICU wards in the BVVS HSK Hospital and Research Centre, Bagalkot who met the inclusion criteria were selected as sample for the study.

Instruments:

The study was conducted using a Structured Questionnaires with items related socio demographic data of bedridden patients and Standardized Braden Pressure Ulcer Risk Assessment Scale were used to assess the risk of pressure ulcer.

Description of data Collection Instruments

Part I: Questionnaires to assess socio-demographic data of bedridden patients.

PART II: Standardized Braden Pressure Ulcer Risk Assessment Scale were used to assess the risk of pressure ulcer.

Data Collection Procedures:

The data collection was carried out from 19-07-2023 to 10-08-2023, among bedridden patients, who are working in the BVVS HSK Hospital and Research Centre, Bagalkot. Permission was obtained from Dean, Medical superintendent and Managers of hospitals. Data was collected from bed ridden patient by explaining the purpose of this study. The pre-test carried out on bedridden patients and who are having the sign of pressure ulcer was assessed using Braden Pressure Ulcer Risk Assessment Scale. In experimental group after the pre-test water glove application given for 7 days continuously, in between Day3, Day 5, Day7 was assessed as a post test. Written consent was obtained from the study participants. After the 7 days the post test data was collected.

Variable under Study:

Dependent Variables: Risk of Heel Ulcer

Independent Variable: Water Glove Application.

Sociodemographic Variables: age, gender, duration of stay, type of ward, type of bed, illness, frequency of changing position, comfort devices.

Statistical Analysis:

The obtained data were statistically examined in terms of the objectives of the study using descriptive and inferential statistics. A master sheet was prepared with responses given by the study participants. Frequencies and Percentage was used for the analysis of demographic data, and independent t test was used to determine effectiveness of water glove application. The Chi square(x^2) test to find out the association between socio demographic variables and pretest level of risk of heel ulcer.

Ethical Clearance: A certificate of ethical permission was obtained from ethical committee of the institution and written consent was taken from each participant.

RESULTS

Part I: Description of Socio- Demographic Variables

In this study bedridden patients according to their age groups reveals that majority of subjects 15 (50%) belongs to the middle age group of 40 to 59 years in experimental group. 16 (53%) belongs to the middle age group of 40 to 59 years in Control group. according to their gender reveals that majority of subjects 21 (70%) were males in experimental group. 21 (70%) were males in control group. according to duration of stay in the hospital, reveals that majority of subjects 16 (53%) stayed in the hospital for the duration of 04 to 05days in experimental group. majority of subjects 18 (60%) stayed in hospital for the duration of 04 to 05days in Control group. according to type of ward, in the Experimental group reveals that majority of subjects 29 (97%) are admitted in critical wards. 28 (94%) are stayed in critical ward in the control group. according to type of bed, reveals that majority of subjects 14 (47%) are using Airbed in the Experimental group. majority of subjects 16 (53%) are used airbed in Control group. according to type of Illness reveals that majority of subjects 10 (33%) of ortho cases in the Experimental group. majority of subjects 11 (37%) of Any surgical cases in the Control group. according to frequency of changing position,

reveals that majority of subjects 19(63%) of changing position every 4 times in 24 hours in the Experimental group. majority of subjects 13(43%) of changing position every 4 times in 24 hours in the control group.

Part II: Assessment of heel ulcer score among bedridden patients in experimental group and control group experimental & control groups.

Table 1: Assessment of heel ulcer score among bedridden patients in experimental group and control group (before intervention). N=60

Sl.no	Description	Scores	Experimental		Control	
			F	%	F	%
1	Normal	19-24	0	0	0	0
2	Mild risk	15-18	13	44	12	40
3	Moderate risk	13-14	10	33	14	47
4	High risk	10 -12	6	20	4	13
5	Severe risk	≤ 09	1	3	0	0

Table 1 depicts that table showing the frequency and percentage distribution of samples awarding to the heel ulcer score among bedridden patients in the experimental and control group before water glove application (pretest). In the experimental group 13(44%) of the samples had mild risk heel ulcer score level, 10(33%) of the samples had moderate risk heel ulcer score level, 6(20%) of the samples had high heel ulcer score level, 1(3%) of the samples had severe heel ulcer score level. Similarly, in control group 12(40%) of the samples had mild risk heel ulcer score level, 14(47%) of the samples had moderate risk heel ulcer score level, 4(13%) of the samples had high heel ulcer score level.

Table 2: Assessment of heel ulcer score among bedridden patients in experimental group and control group (after intervention) N=60

Sl.no	Description	Scores	Experimental		Control	
			F	%	F	%
1	Normal	19-24	6	20	0	0
2	Mild risk	15-18	15	50	6	20
3	Moderate risk	13-14	7	24	15	50
4	High risk	10 -12	2	6	8	27
5	Severe risk	≤ 09	0	0	1	3

Table 2 showing the frequency and percentage distribution of samples awarding to the heel ulcer score among bedridden patients in the experimental and control group after water glove application (posttest). In the experimental group 2(7%) of the samples had normal heel ulcer score level, 15(50%) of the samples had mild risk heel ulcer score level, 9(30%) of the samples had moderate risk heel ulcer score level, 4(13%) of the samples had high heel ulcer score level. Similarly, in control group 10(34%) of the samples had mild risk heel ulcer score level, 15(50%) of the samples had moderate risk heel ulcer score level, 4(13%) of the samples had high heel ulcer score level. 1(3%) of the samples had severe heel ulcer score level.

Table 3: mean, standard deviation based on braden pressure ulcer risk assessment scale of in experimental & control groups N=60

Interventions days		Groups	Sample size	Mean	SD
Day -1	Pretest	Experimental group	30	8.3	1.76
		Control group	30	13.3	1.55
Day- 3	Post test	Experimental group	30	12.2	2.13
		Control group	30	12.5	1.58
Day- 5		Experimental group	30	15.4	1.35
		Control group	30	12	1.28
Day -7		Experimental group	30	18.9	1.86
		Control group	30	10.8	1.38

Table 3 shows that Revealed that the mean and Standard Deviation on Heel Ulcer Among Bed Ridden Patients, by Using Braden Pressure Ulcer Risk Assessment Scale are pretest, that is (Day1) 8.3 ± 1.76 in experimental group, where as in control group 13.3 ± 1.55. The post intervention assessment on Day 3 in experimental group is 12.2 ± 2.13, whereas in control group 12.5 ± 1.58. The post intervention assessment on Day 5 in experimental group is 15.4 ± 1.35, whereas in control group 12 ± 1.28. The post intervention

assessment on Day 7 in experimental group is 18.9 ±1.86, whereas in control group 10.8 ± 1.38.

PART III: Assessment of difference between the heel ulcer score among bedridden patients in both experimental group and control group.

Table 4: Difference between the heel ulcer score among bedridden patients in both experimental group and control group N=60

Sl. No	Group	Observations	Mean	Standard Deviation	Mean difference	Calculated t Value	Table Value 't'	P value
1	Experimental group	Pretest	8.333333	1.768173	10.57	25.004531	1.699	P< 0.5
2		Post test (Day7)	18.9	1.863441				
3	Control Group	Pretest	13.3	1.556964	-2.43	-9.315151	1.699	**P<0.05**
4		Post test (Day7)	10.86	1.382984				

Table 4 reveals that in experimental group the pre- test mean score was 8.33, Standard deviation was 1.76, and in the post test mean score 18.9, and standard deviation was 1.86, with the paired 't' value of t= 25.004.and the mean difference is 10.57.so it is considered as significant. The dependent test calculated value (25.004531) is more dependent t test tabulated value (1.699). Hence H1 is accepted. There is a significant difference between the mean post -test heel ulcer risk assessment score among bedridden patients in experimental group at 0.05 level of significance. And in control group the pre-test mean score was 13.3, Standard deviation was 1.55, and in the posttest mean score 10.86, and standard deviation was 1.38, with the dependent 't' value of t= -9.31515, .and the mean difference is 1-2.43.so it is considered as significant. The dependent test calculated value (-9.31515) is more dependent t test tabulated value (1.699). Hence H1 is accepted. There is a significant difference between the mean post- test heel ulcer risk assessment score among bedridden patients in control group at 0.05 level of significance.

PART IV: Finding out the effectiveness of water glove application among bedridden patients of experimental and control group.

Table 5: Effectiveness of water glove application among bedridden patients of experimental and control group N=60

Sl.No	Group	Mean	Standard Deviation	Mean difference	Calculated t Value	Table Value 't'	P value
1	**Experimental**	18.9	1.863441	8.04	18.9	1.699	P< 0.5
2	**Control**	10.86	1.382984				

Table 5 shows that in experimental group the post- test mean score and standard deviation was 18.9± 1.863441, and in the control group the post test mean score and standard deviation was 10.86± and 1.382984, with the Independent 't' value of t=18.9 .and the mean difference is 8.04 .so it is considered as significant. The independent T test calculated value (18.9) is more than the independent t test tabulated value (1.699). Hence H1is accepted. There is a significant difference between the mean post -testheel ulcer risk assessment score among bedridden patients in experimental group at 0.05 level of significance.

Hence the study revealed that the water glove application is effective.

Part V: Association of pretest scores of risk reduction on heel ulcer among bedridden patients in experimental and control group with their selected demographic variables.

Table 6: Association of pretest scores of risk reduction on heel ulcer among bedridden patients in both experimental and control group with their selected demographic variables N=60

S. No	Demographic variables		F(n=60) both the groups.	χ 2	P value	Significance/Not Significance
1.	**Age in years**	20-39 years	11	χ 2=0.260 Df=1	0.6103	**No Significance**
		40-59 years	31			
		60 above	18			
2	**Gender**	Male	42	χ 2=0.260 Df=1	0.6103	**No Significance**
		Female	18			
3	**duration of stay**	2-3 days	13	χ 2=1.358 Df=1	0.243	**Significant**
		4-5 days	34			
		5-6 days	13			

		7 and above	0			
4	**Type of ward**	Critical	57	χ 2=0.032 Df=1	0.858	**No Significance**
		Non critical	3			
5	**Type of bed**	Rexine Bed	7	χ 2=3.300 Df=1	0.0693	**Significant**
		Water Bed	23			
		Air Bed	30			
6	**Illness**	Trauma cases	9	χ 2=0.793 Df=1	0.373	**Significant**
		Neuro cases	17			
		Ortho cases	17			
		Any surgical cases	17			
7	**Positioning time**	12 times	0	χ 2=1.116 Df=1	0.2908	**Significant**
		6 times	16			
		4 times	32			
		2 times	12			
8	**Comfort devices**	Foot board	5	χ 2= 2.329 Df=1	0.129	**Significant**
		Pillow	38			
		Soft cloth	17			

Table 6 shows that the association between the pre-test scores of both the groups with their socio demographic variables calculated chi square test values are age(χ 2=0.260), gender(χ 2=0.260) duration of stay(χ 2=1.358),Type of ward (χ 2=0.032), Type of bed (χ 2=3.300), illness (χ 2=0.793), Positioning time(χ 2=1.116), Comfort devices(χ 2= 2.329).The calculated values are less than the P value in age, gender, type of ward, it's not significant. Hence theH2 there will be a significant association between the pretest ulcer scores among bedridden patients with their socio demographic variables, hence its rejected. Few clinical variables duration of stay, Type of bed, Illness, Positioning time, Comfort devices χ 2 values are more than the P Value, Hence its accepted H2 there will be a significant association between the pretest ulcer scores among bedridden patients with their socio demographic variables, hence its accepted.

DISCUSSION

The findings of the present study are discussed in light of previous scientific studies in this chapter and discussion regarding findings of the study is presented in accordance with the objectives of the study and hypothesis. In current study The experimental group the post- test mean score and standard deviation was 18.9± 1.863441, and in the control group the post test mean score and standard deviation was 10.86± and 1.382984, with the Independent 't' value of t=18.9 .and the mean difference is 8.04 .so it is considered as significant. The independent T test calculated value (18.9) is more than the independent t test tabulated value (1.699). Hence H1 is accepted. Hence the study revealed that the water glove application is effective. Study supported by Ammu and Dharmarathnakara from Dr.Mahalingam Institute of Paramedical Sciences & Research, Erode, to assess the assess the effectiveness of water glove application on risk reduction of heel ulcer among bedridden patients in Erode Medical Centre Hospital. The quasi experimental study design with 40 bedridden patients divided into 2 groups the experimental group, the mean pre test score of heel ulcer was 15 with standard deviation 3.4 where as the mean post test score of heel ulcer was 19 with standard deviation of 2.7. The obtained 't' value 13.2 was significant at $p < 0.05$ level. In control group the mean pre test score of heel ulcer was 14 with standard deviation 3.4. Whereas the mean post test score of heel ulcer was 12 with standard deviation of 3.1.the obtained 't' value 2.3 was significant at $p < 0.05$ level.

Limitations:

The study limited to the sample of 60 bedridden who are having risk of heel ulcer who are admitted general and ICU wards in the BVVS HSK Hospital and Research Centre, Bagalkot.

CONCLUSION

The study concludes that there was significant difference found between the two groups, therefore study showed that that water glove application was found to reduce the heel ulcer among bed ridden patients.

DECLARATION BY AUTHORS

Ethical Approval: Institutional ethical clearance approved.

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Conflict of Interest: The authors declare no conflict of interest.

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