International Journal for Multidisciplinary Research (IJFMR)
E-ISSN: 2582-2160 ● Website: www.ijfmr.com ● Email: editor@ijfmr.com

Effectiveness of Computer Aided Teaching Programme on Knowledge of Offloading Devices for Reducing the Level of Diabetic Foot Ulcer Among Patients with Grade II DFU in Government Headquarters Hospital, Erode.

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Abstract:
The current study's objective was to assess the effectiveness of computer aided teaching programme on knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with grade II diabetic foot ulcer. Pre- experimental design where one group pre and post-test design was adopted for this study. Convenient sampling technique was used in this study. Samples included in this study were both genders with Grade II, III, IV DFU, 30 years and above, structured knowledge questionnaire were used to assess the level of knowledge of offloading devices among patients with Grade II DFU. The study's results indicate that pre-test the mean score was 0.25 ± 0.44 which was mean percentages 1.25%. In post test the mean score was 0.70±0.47 which was mean percentages 3.5%. Significant association was obtained between post test knowledge scores in dietary pattern and types of workers (χ^2=4.45 and χ^2= 0.09; Significant). Whereas no significant association was observed in post-test knowledge regarding offloading devices for Age, Gender, BMI, Affected foot, duration of illness and co-morbid illness. There was statistically highly significant effectiveness in computer aided teaching programme on knowledge regarding offloading devices for reducing diabetic foot ulcer among patients with Grade II diabetic foot ulcer.

Keyword: Effectiveness, Computer aided teaching programme, knowledge, Offloading Devices, Grade II DFU.

INTRODUCTION.

The most prevalent kind of diabetes is type 2, which is followed by type 1. Even though type 1 and type 2 diabetes have quite different pathophysiologies, they both have similar complications. Diabetic foot ulceration (DFU) is one of the most serious of these complications, and it can be very expensive for patients, families, and healthcare systems. DFU is the main cause of lower limb amputation in diabetic patients, which further stresses both patients and healthcare professionals. It is characterized by the development of deep, slowly healing wounds on the lower limbs. **Aled Wyn Aled 2024.**

An estimated 18.6 million individuals globally, including 1.6 million Americans, suffer from diabetic foot ulcers each year. These ulcers are linked to an increased risk of death and occur before 80% of lower extremity amputations in individuals with diabetes. In their lifetime, up to 34% of persons with type 1 or type 2 diabetes get foot ulcers. . **Armstrong DG 2023.**

The Kingdom of Saudi Arabia's Makkah city was the site of a cross-sectional study. The degree of diabetes awareness was assessed using a self-administered Diabetes awareness Test 2 (DKT2). With a global score of 23, it was divided into two sections: general knowledge and insulin use. In all, 942 diabetic patients were included in the study. 55.1:44.9 was the male to female ratio, and the mean worldwide DKT2 score was 13.3±3.2 (57.8%±13.3%). 4.7% of patients had excellent understanding about diabetes, 29.2% had low knowledge, and the rest (66.1%) had average knowledge. Younger ages, higher educational attainment, longer duration of diabetes, and a favorable family history of diabetes were found to be associated with better knowledge and significant associations. **Asim M Zowgar 2017.**

STATEMENT OF THE PROBLEM

Effectiveness Of Computer Aided Teaching Programme On Knowledge Of Offloading Devices For Reducing The Level Of Diabetic Foot Ulcer Among Patients With Grade II DFU In Government Headquarters Hospital, Erode.

OBJECTIVES:

1. To assess the knowledge level of offloading devices for reducing the level of diabetic foot ulcer among patients with grade II DFU before and after Computer Assisted teaching programme.
2. To determine the effectiveness of Computer assisted teaching programme on knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with grade II DFU.
3. To find out association between post-test score knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with grade II DFU with their selected demographic variables.

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HYPOTHESES:

H_1. There is a significant knowledge level of offloading devices for reducing diabetic foot ulcer level among patients with grade II DFU before and after Computer Assisted teaching programme.

H_2. There is a significant effectiveness of Computer assisted teaching programme on knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with grade II DFU**.**

H_3.There is a significant association between post-test score knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with grade II DFU with their selected demographic variables.

Review of Literature:

In order to heal diabetic foot ulcers (DFU), offloading treatment is essential. The purpose of this systematic review was to evaluate the efficacy of offloading therapies for individuals with DFU. To address 14 clinical question comparisons, Cochrane databases and trial registries for all studies pertaining to offloading therapies in individuals with DFU are used. Plantar pressure, weight-bearing activities, adherence, new lesions, falls, infections, amputations, ulcers healed, quality of life, expenses, cost-effectiveness, balance, and sustained healing were among the outcomes. Key data was gathered

from included controlled studies after they were independently evaluated for bias risk. **P. A Lazzarini 2023.**

One of the main consequences of poorly managed diabetes mellitus that results in lower extremity amputation is diabetic foot ulcers. Repeated risk assessment is necessary for early detection, ideally daily, especially for high-risk patients. The foot's ulcer-prone areas experience more temperature fluctuations than its non-ulcerous sections. The final goal of this research was to use asymmetry analysis to create an effective algorithm for the early diagnosis of diabetic foot using infrared thermal imaging. The region growth approach is used to segment the left and right foot regions. Asymmetry between the ipsilateral and contralateral regions of the foot was noted in the diabetic foot case, in contrast to the symmetric temperature distributions seen in normal plantar thermograms. The 11 foot regions of interest were used to extract the texture and temperature features, and the ipsilateral and contralateral foot regions' features were subjected to asymmetric analysis. The region of interest was divided into normal and ulcer categories using a support vector machine. The maximum accuracy, sensitivity, and specificity of the suggested approach were 95.61%, 96.5%, and 92.41%, respectively. The suggested technique's performance demonstrates that it is reliable and efficient for identifying ulcers pre-signs early on and helps clinicians treat diabetic foot. **J. Saminathan 2020.**

Pressure mitigation is crucial for the healing of plantar diabetic foot ulcers. The investigator therefore discusses characteristics and considerations associated with the use of offloading devices. A diabetic foot ulcer management survey was sent to foot clinics in all 50 states and the District of Columbia in 2005. A total of 901 geographically diverse centers responded. The survey recorded information regarding usage frequency and characteristics of assessment and treatment of diabetic foot ulcers in each center. **Results** of the 895 respondents who treat diabetic foot ulcers, shoe modifications (41.2%, $P < 0.03$) were the most common form of pressure mitigation, whereas total contact casts were used by only 1.7% of the centers. This study reports the usage and characteristics of offloading devices in the care of diabetic foot ulcers in a broadly distributed geographic sample. Less than 2% of specialists use what has been termed the “gold standard” (total contact cast) for treating the majority of diabetic foot ulcers. Stephanie C 2008.

Materials and Methods.

The Pre- experimental design where one group pre and post-test design was used to assess the effectiveness of computer aided teaching programme on knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with Grade II DFU**.** Independent Variable in this present study was Computer aided teaching programme and the dependent variable was patients with grade II DFU. The sample was selected in Government Head Quarters Hospital, Erode which is 20 kms away from Dhanvantri College of Nursing. It is a 750 bedded hospital, on average 50 - 60 diabetic foot ulcer patients were admitted per month. The population for the present study was patients with grade II DFU. The total sample size was 30 patients. Convenient Sampling Technique was used to select the patients. Samples included in the study are patients with grade II DFU admitted in Government Head Quarters Hospital and present during the period of data collection. Samples included were both the Gender with Grade II diabetic foot ulcer, 30 years and above, and those who underwent amputation, Diabetic foot ulcer in the stage of 3 & 4 whose knows Tamil. Diabetic foot ulcer with unconsciousness and Coma were excluded in the study. Data was collected for a period of one month. Computer assisted teaching programme was given for 7 members per week (Tamil power point containing diabetic foot care and

images offloading devices and There are 2 sections of tools are used. They are, Section–A: Demographic Variables, Section-B: Knowledge questionnaire regarding offloading devices the tool used to assess the level of knowledge among patients with Grade II Diabetic foot ulcer. Reliability of the tool was assessed by using Test- retest method and the value was found to be reliable. **(r^1 = 0.86).**

DATA COLLECTION PROCEDURE:

Before any data was collected, consent was acquired from administrator and the concerned authority of Government Head quarters hospitals, Erode. Data was collected for a period of one month.

The Data was gathered by the researcher from the Grade II Diabetic foot Ulcer for 7 samples per week. Tamil Power Point was administered once daily for an hour /week. On the eighth day, a post-test was administered using knowledge questionnaire regarding offloading devices. (**Non- removable cost, Removable cost, Therapeutic foot wear, offloading shoes, Felted foam, Bed rest, Crutch assisted gait, Wheel chair, proper positioning, regularly removing calluses, Debriding the ulcer**).

Results:

Table1. Percentage and frequency distribution of patients with Grade II diabetic foot ulcer according to their demographic variables. (N=30)

S. No.	Demographic Variables	Patients with Grade II DFU	
		Frequency N_1	Percentage %
1	**Age in years**		
	❖ >30 to40 year	5	17
	❖ 41to 50 year	6	20
	❖ 51to60 year	9	30
	❖ >60 year	10	33
2	**Gender**		
	a) Male	18	60
	b) Female	12	40
3	**Dietary pattern**		
	a) Vegetarian	4	13
	b) Non vegetarian	16	54
	c) Ova-vegetarian	10	33
4	**BMI**		
	a) >18.5	4	13
	b) 18.6 to24.9	6	20
	c) 25 to 29.9	12	40
	d) >30	8	27
5	**Types of workers**		
	a) Sedentary workers	10	33
	b) Moderate workers	8	27
	c) Heavy workers	12	40
6	**Affected foot**		

	a)Right	12	40
	b)Left	14	47
	c)Both	4	13
7	**Duration of illness**		
	a) Less than 6 months	6	20
	b) more than 6 months	14	47
	C) one year	10	33
8	**Co-morbid illness**		
	a. DFU with Hypertension	15	50
	b. DFU with Cardiac Illness	12	40
	c. DFU with Kidney diseases	3	10

Table 2: Percentage and Frequency distribution of Grade II Diabetic foot ulcer pre test and post test knowledge scores among patients with Diabetic foot ulcer (N= 30).

Level of knowledge	**Grade II DFU**			
	Pretest scores		**Post test scores**	
	N	**%**	**N**	**%**
Highly adequate	0	0	7	23
Adequate	7	23	16	54
Inadequate	14	47	4	13
poor	9	30	3	10

Table 3: Level of knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with grade II DFU before and after Computer assisted teaching programme N= 30

Grade II DFU	**Maximum score**	**Mean**		**SD**		**Mean %**	
		Pre test	Post test	Pre test	Post test	Pre test	Post test
Level of knowledge	20	0.25	0.70	0.44	0.47	1.25 %	3.5%

Table 4: Paired t test value of pre and post test knowledge score regarding offloading devices for reducing diabetic foot ulcer level among patients with grade II DFU before and after Computer assisted teaching programme.

S.No	**Knowledge score**	**Paired t test value**	**Level of significant**
1.	Pre-test and post test	3.33	P <0.0001 Significant

Table-5:Chi-square value of Association between post test scores of knowledge regarding offloading devices for reducing diabetic foot ulcer level among patients with grade II DFU diabetic foot ulcer patients with their demographic variables.

S. No.	Demographic Variables	DF	Chi-square	Level of significance
1	Age in years	3	3.49	P>0.05
2	Gender	1	0	P>0.05
3	Dietary pattern	1	0.09	P<0.05
4	BMI	3	0.18	P>0.05
5	Types of workers	3	4.45	P<0.05
6	Affected foot	2	0	P>0. 05
7	Duration of illness	3	0.85	P>0.05
8	Co-morbid illness.	2	3.63	P>0.05

P>0.05 not Significant **P<0.05 Significant**

DISCUSSION

The study was experimental in nature. It was conducted among patients with Grade II diabetic foot ulcer at Government Headquarters Hospital Erode. The primary purpose of the study was to find out the knowledge of offloading devices for reducing the level of diabetic foot ulcer
The tool used for the study consisted of

Section A: Demographic variables

Section B: Structured Knowledge questionnaire.

- Distribution of sample character according to their age group depicts that, Percentage distribution of were in age group >30 – 40 years is 17%, 20 % distribution of were in age group 41 – 50 years, there is 33% distribution of were in age group > 60 years.
- Distribution of patients with Grade II diabetic foot ulcer according to their Gender depict that, the highest percentage (60%) of diabetic foot ulcer were Male, whereas lowest (40%) of patients with Grade II diabetic foot ulcer were Females.

- Distribution of patients with Grade II diabetic foot ulcer according to their Dietary pattern depicts that, most Non-vegetarian (54%) of the Grade II diabetic foot ulcer had vegetarian lowest percentage (13%) of the patients with Grade II diabetic foot ulcer.
- Distribution of patients with diabetic foot ulcer according to their BMI depicts that, highest in 25 to 29.9 BMI (40%) percentage of diabetic foot ulcer, here as lowest in BMI of >18.5 (13%) percentage of patients with Grade II diabetic foot ulcer, majority of the diabetic foot ulcer patients were heavy workers, most of them left side affecting diabetic foot ulcer and more than 6 month duration of diabetic foot ulcer, co-morbid illness were DFU with hypertension.
- Percentage distribution majority (54%) patient's with Grade II diabetic foot ulcer was having adequate knowledge in post-test, remaining 23% patients with Grade II diabetic foot ulcer was having highly adequate knowledge, and there was only 13 % of patients with Grade II diabetic foot ulcer having inadequate knowledge.
- Comparison of mean, SD, mean percentage knowledge of diabetic foot ulcer pre and post test scores reveals that, the pre test mean & SD score was 0.25 ± 0.44 which was 1.25 mean percentage, whereas in post test mean & SD score was 0.70 ± 0.47 Which was 3.5 mean percentage. It depicts that computer aided teaching programme was effective in improving the knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with Grade II diabetic foot ulcer.
- The paired t test value of knowledge score of diabetic foot ulcer 3.3, which is P <0.0001 Significant, It depicts that computer aided teaching programme was effective in improving the knowledge of offloading devices for reducing the level of diabetic foot ulcer among patients with Grade II diabetic foot ulcer.
- Significant association was obtained between post test knowledge scores in Dietary pattern and types of working status **(χ^2=4.45 and χ^2= 0.09; Significant**). Whereas no significant association was observed a between post-test knowledge of offloading devices for reducing the level of diabetic foot ulcer for Age, Gender, BMI, Affected foot, Duration of illness and co-morbid illness,

CONCLUSION

Based on the findings of the study the following conclusions were drawn. The study findings revealed that providing of computer aided teaching programme were highly significant to improve Knowledge on offloading devices regarding reducing the level of diabetic foot ulcer among patients with Grade II diabetic foot ulcer. There was statistically significant evidence on improvement of knowledge regarding offloading devices for reducing diabetic foot ulcer level among patients with grade II DFU diabetic foot ulcer patients.

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