"Effectiveness of planned teaching programme on knowledge regarding topical insulin in healing of diabetic foot ulcer among staff nurses in selected hospitals at Udaipur, Rajasthan".

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Abstract: *A quasi experimental One group pre-test post-test study to assess the effectiveness of planned teaching programme on knowledge regarding topical insulin in healing of diabetic foot ulcer among staff nurses in selected hospitals at Udaipur, Rajasthan The sample consisting of 140 Staff nurses in selected hospitals at Udaipur by using simple random sampling technique method. The tool comprised of by using structured knowledge questionnaire. The pretest was conducted and the planned teaching programme was administered. The post test was conducted after one week. The data obtained were analyzed by using differential and inferential statistics. The mean score of post-test knowledge 22.06 (73.53%) was apparently higher than the mean score of pre-test knowledge 11.45 (48.45%), suggesting that the planned teaching programme was effective in increasing the knowledge of the staff nurses regarding topical insulin in healing of diabetic foot ulcer. The mean difference 10.61 between pre-test and post-test knowledge score of the staff nurses was found to be significant.*

Key words – *One group pre – test post – test quasi experimental study, staff nurses, and topical insulin in healing of diabetic foot ulcer*

I. Introduction

Diabetes mellitus is a chronic systemic disease characterized by either a deficiency of insulin or a decreased ability of the body to use insulin. Diabetes mellitus is sometimes referred to as High sugars by both clients and health care providers. The notion of associating sugar with diabetes is appropriate because the passage of large amounts of sugar-laden urine is characteristics of poorly controlled diabetes. Diabetes may also result from other disorders or treatments. Genetic defects in the beta cells can lead to the development of diabetes. Several hormones such as growth hormone, cortisol, glucagon, or epinephrine can antagonize or counteract insulin. Excess amount of these hormone (as in acromegaly, Cushing syndrome glucagonoma and pheochromocytoma) cause diabetes. In addition certain drugs (e.g. glucocorticoids and thiazides) may cause diabetes.[1] Foot ulcer refers to an ulcer in the upper and lower extremities due to any injury or infection, secondary to diabetes mellitus or due to peripheral neuropathy. Diabetic foot infections are common in between 50% and 75% of lower extremity amputations are performed on people with diabetes. More than 50% of these amputations are thought to be preventable, provide patients are taught foot ulcer care measures and practice them on a daily basis. [2] Relative or absolute lack of insulin or its action is a hallmark of diabetes disease and defective insulin action in the skin contributes to wound healing defects in this disease. Due to underlying angiopathy and neuropathy, foot ulcers are quite common in diabetics. Topical insulin accelerates wound healing in the skin of diabetic rats and humans. Insulin stimulates the growth and development of different cell types and affects proliferation, migration, and secretion by keratinocyte, endothelial cells, and fibroblasts.[3] Use of Topical insulin in the past, insulin was made from beef and pork pancreas, but these forms of insulin are no longer available. Today, only human insulin was used. Human insulin was not directly harvested from human organs but was derived from common bacteria (e.g. Escherichia coli) or yeast cells using recombinant DNA technology.[4] The idea of using insulin topically has been around for decades dating back to 1960s greenway. Since then there have been many experiments on animals as well as humans but the usefulness of insulin in wound healing still remains speculative and safety issues still have to be addressed. Topical insulin in combination with zinc in animal studies has shown to heal wounds faster. It regulates wound inflammatory response by stimulating proliferation and migration of macrophages and keratinocyte in adjacent tissues. However, no suitable method for routine administration of insulin has been reported.[5] According to

World J Diabetes in year 2014, Diabetic foot ulcers are the sequence of multiple factors including peripheral neuropathy, decreased blood supply, high plantar pressures etc, and a significant risk for morbidity, limb loss and mortality. Wound care is considered to be an important component of diabetic foot ulcer management. Because the lifetime risk of foot ulceration in people with diabetes is 15%-20%. More than 15% of foot ulcers result in amputation of the foot or limb. Several other population-based studies indicate a 0.5%-3% annual collective incidence of diabetic foot ulcers. The prevalence of foot ulcers reported varies from 2% to 10%. It has been estimated that around 15%-27% patients with diabetes require lower limb amputations.[6] According to Global Report on diabetes in year 2014, an estimated 422 million adults were living with diabetes, compared to 108 million in 1980. African Region 25, Region of the Americas 62, Eastern Mediterranean Region 43, European Region 64, South-East Asia Region 96, Western Pacific Region 131 and total 422 million peoples are affected with diabetes. The global prevalence of diabetes has nearly doubled since 1980, rising from 4.7% to 8.5% in the adult population. This reflects an increase in associated risk factors such as being overweight or obese. Diabetes caused 1.5 million deaths in 2012. Higher-than-optimal blood glucose caused an additional 2.2 million deaths occur before the age of 70 years. It is expected that the percentage of deaths higher in low- and middle-income countries than in high-income countries.[7]

A study was conducted by **Shailesh K & et al**. in year 2014 at North India on Prevalence of Diabetic Foot Ulcer and Associated Risk Factors in Diabetic Patients. This was an observational study where 678 diabetic patients were examined, of which 97 reported diabetic foot ulcers. Patients were interviewed using a pre-tested structured questionnaire to document clinical history. Prevalence of Diabetic Foot Ulcer among diabetic patients was 14.30%. of 581 patients suffering from diabetes alone, 42.16% belonged to rural areas whereas among the cases 70.10% belonged to rural areas oral hypoglycemic treatment (OR = 2.90, P = 0.00), insulin treatment (OR = 9.58, P = 0.00), The study indicated that the Age, duration of diabetes, tobacco use, oral hypoglycemic treatment/insulin use and rural location were identified as important risk factors.[8]

II. Research Elaborations

Statement of problem –

"A study to assess the effectiveness of planned teaching programme on knowledge regarding topical insulin in healing of diabetic foot ulcer among staff nurses in selected hospitals at Udaipur, Rajasthan".

III. Objectives
1. To assess the pre-test knowledge score regarding topical insulin in healing of diabetic foot ulcer among staff nurses.
2. To develop and administer planned teaching programme regarding topical insulin in healing of diabetic foot ulcer among staff nurses.
3. To assess the post-test knowledge score regarding topical insulin in healing of diabetic foot ulcer among staff nurses.
4. To determine the effectiveness of planned teaching programme regarding topical insulin in healing of diabetic foot ulcer among staff nurses.
5. To find out the association between the pre-test knowledge score with selected socio demographic variables.

IV. Hypothesis

H_1- There is significant difference between the pre-test and post-test knowledge scores regarding topical insulin in healing of diabetic foot ulcer among staff nurses.

H_2- There is significant association between pre-test knowledge score with selected socio demographic variables.

V. Materials And Methods

Population – Staff Nurses.

Sample- Staff nurses in selected hospitals at Udaipur, Rajasthan".

Sample Size – 140 Staff Nurses.

Setting – Pacific hospital Umarada Udaipur Rajasthan, GBH General hospital Udaipur Rajasthan, Pacific hospital Bedla Udaipur Rajasthan, and Geetanjali hospital Udaipur Rajasthan, India
The conceptual framework for the present study is based on WHO's System Model

VI. Research Design

The research design selected for the present study was a one group pre-test post-test research design

PRE-TEST (Dependent variable)	TREATMENT (Independent variable)	POST –TEST (Dependent variable)
O1	X	O2
Knowledge of Staff Nurses.	Planned teaching programme.	Knowledge of Staff Nurses.

Table 1: Quasi experimental one group pre and post-test research design

The interpretations of the symbol are as below:

O1   -   Administration of pre-test knowledge questionnaire
O2   -   Administration of post-test knowledge questionnaire
X   -   Intervention, treatment (independent variable) i.e.Planned teaching programme.

ETHICAL CONSIDERATION

After obtaining permission from research committee of Geetanjali College of Nursing, prior permission was obtained from nursing superintendent and medical superintendent of Pacific hospital Umarada Udaipur Rajasthan, GBH General hospital Udaipur Rajasthan, Pacific hospital Bedla Udaipur Rajasthan, and Geetanjali hospital Udaipur Rajasthan, India.Consent was taken from each participant who had participated in the study.

DESCRIPTION OF THE TOOL

The structured knowledge questionnaire consisted of two parts i.e. Part – I & II.

Part - I: consisted of 7 items on socio- demographic data such as Age in years, gender, area of residence, educational status, year of experience, area of working, attended any workshop, seminar regarding diabetic foot ulcer and topical insulin.

Part - II: consisted of 30 knowledge items. Each item was multiple choices in nature with 4 choices.

SCORING

The knowledge of staff nurses regarding the outcomes of topical insulin in healing of diabetic foot ulcer was scored as follows, one mark for each correct answer and zero marks for incorrect answer. The maximum score was 30, to interpret level of knowledge the score was distributed as follows;

Interpretation of knowledge:

Level	Range
Inadequate knowledge	0-50 %
Moderate knowledge	51-75 %
Adequate knowledge	76-100 %

An answer key was prepared for scoring answer to the structured knowledge questionnaire.

DATA COLLECTION AND DATA ANALYSIS

The data was presented under the following sections

Section-I: Description of socio-demographic variables of the respondents.

Section-II: Findings related to knowledge scores of respondents on topical insulin in healing of diabetic foot ulcer.

Section-III: Findings related to association between pre-test knowledge score and selected demographic variables of Respondents.

VII. Results

Table 2:- Area wise pretest and post test knowledge score of Respondents regarding Topical insulin in healing of diabetic foot ulcer

| rea of Knowledge		Pre-test			Post-test		
		Mean score	%		re		SD
Diabetes mellitus		1.35	33.73	46.10	3.17	79.25	107.96
Diabetic foot ulcer		6.01	40.4	52.74	11.04	76	92.07
Topical insulin		4.08	37.09	48.73	7.85	71.36	92.14
Total	30	**11.44**	**111.22**	**147.57**	**22.06**	**226.62**	**294.17**

N=140.

Table 2 : Depicts that the pre test highest mean percentage obtained by the respondents is 40.04% with SD of 52.74 in the aspect of Diabetic foot ulcer, 37.09% with SD 48.73 in the aspect of Topical insulin, 33.73% with SD 46.10 in the aspect of Diabetes mellitus.

Depicts that the post test highest mean percentage obtained by the respondents is 79.25 with SD 107.96 in the aspect of Diabetes mellitus, 76 with SD 92.07 in the aspect of introduction of Diabetic foot ulcer, 71.36 with SD 92.14 in the aspect of Topical insulin.

Table 3:- Distribution of Respondents by the level of knowledge.

N=140

LEVEL OF KNOWLEDGE	FREQUENCY		PERCENTAGE	
	Pre test	**Post test**	**Pre test**	**Post test**
Inadequate knowledge (0-50%)	124	00	88.60%	0 %
Moderate knowledge (51-75%)	16	84	11.40%	60%
Adequate knowledge (76-100%)	00	56	0%	40%
Total	**140**	**140**	**100%**	**100%**
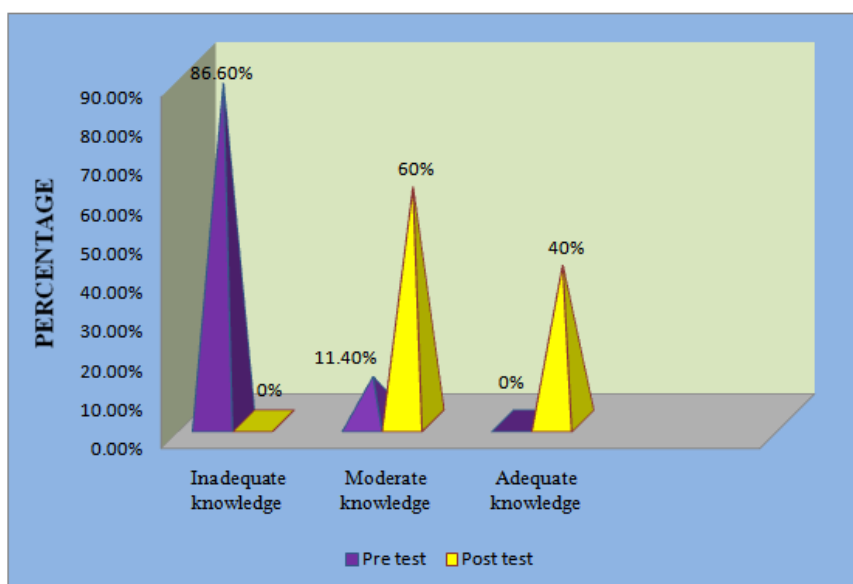
Figure 1: Distribution of Respondents by the level of knowledge.

Table 3 & Figure 1: The table represents the post test knowledge level of respondents regarding topical insulin in healing of diabetic foot ulcer. The result showed that 60% of the respondents had moderately adequate knowledge and 4o% of the respondents had adequate knowledge regarding topical insulin in healing of diabetic foot ulcer.

Table 4:- Effectiveness of the Planned teaching programme regarding knowledge of Topical insulin in healing of diabetic foot ulcer among staff nurses.

N=140

	Mean	Mean Percentage (%)	SD	Enhancement	Enhancement percentage (%)	Df	T	Inference
Pretest	11.45	38.45	4.01	10.61	35.08	139	48.22	S
Post test	22.06	73.53	2.68					

S = Significant

Table 4:- The result reveals that the mean post test knowledge score 22.06(73.53%) is greater than the mean pre test knowledge score 11.45(38.45%). The above table also depicts that the enhancement in the knowledge of respondents is 10.61 (35.08%) supporting the post test knowledge score are higher than the pretest knowledge score. The data further represent that the 't' value of 48.22 is significantly higher than the table value 1.96 at 0.05 level of significance. This indicates that there was difference in pre test and post tests knowledge score and further the data supports that the planned teaching programme regarding topical insulin in healing of diabetic foot ulcer is effective in improving the knowledge score of respondents.

H_1 **-** There is a significant difference between the pre and post test knowledge score of staff nurses on topical insulin in healing of diabetic foot ulcer. Hypothesis was tested at 0.05 levels. The calculated 't' value 48.22 is significantly higher than the table value 1.96 at 0.05 level of significance. This indicates that there is significant difference between the pre test and post test knowledge score hence the hypothesis H_1 is accepted.

H_2**:** There is a significant association between pre-test knowledge score regarding topical insulin in healing of diabetic foot ulcer with selected demographic variables.

The Chi-square test was carried out to determine the association between the pre test knowledge score and demographic variables such Age in years, gender, area of residence, educational status, year of experience, area of working, attended any workshop, seminar regarding diabetic foot ulcer and topical insulin.

Out of which Age in years, area of residence, year of experience and attended any workshop, seminar regarding diabetic foot ulcer and topical insulin were found to be significantly associated with pre test knowledge at 0.05% level and the rest of the demographic variables were not significant. Hence research hypotheses H_2 is partially accepted.

VIII. Conclusion

This study concludes that there is improvement in the level of knowledge of staff nurses which indicates that the planned teaching programme is effective. The demographic variables of Staff nurses significantly associated with the pre test knowledge score. The development of planned teaching programme will help the staff nurses to enhance their knowledge.

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