

“A STUDY TO ASSESS THE EFFECTIVENESS OF STRUCTURED TEACHING PROGRAMME ON KNOWLEDGE AND PRACTICE REGARDING SELF-ADMINISTRATION OF INSULIN AMONG INSULIN REQUIRING DIABETIC PATIENTS ”

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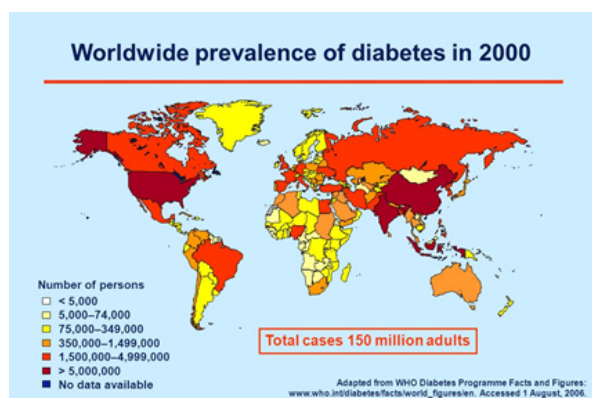
ABSTRACT

The research aimed at finding the effectiveness of structured teaching programme related to self-administration of insulin on knowledge and practice among insulin requiring diabetic patients. One-group pre-test and post-test methods of pre-experimental design were taken. The samples for the study were chosen by non-probability purposive sampling. 30 insulin requiring diabetic patients were selected as sample based on the selection criteria. A structured interview schedule and observational checklist was developed based on review of literature and opinion from experts. Level of knowledge was studied in relation to various aspects like knowledge on diabetes, insulin, administration of injection technique and complication after insulin injection. Data were collected from insulin requiring diabetic patients who attended Krithika Hospital and Research Centre, Salem, Tamilnadu, India. The findings of the study were: The existing level of knowledge on self-administration of insulin was inadequate 15(50%) and the existing practice level was inadequate 16(53%) among insulin requiring diabetic patients. Exposure to the structured teaching programme increased the knowledge ('t' value 12.3) and practice level ('t' value 25.2) among insulin requiring diabetic patients. Majority of the selected background factors like age, education, occupation and duration of disease condition were not associated with knowledge and practice level among insulin requiring diabetic patients regarding self-administration of insulin. Thus, the study concluded that effective teaching programme can improve both knowledge and practice level among patients who were on self-administration of insulin. A similar study could be undertaken on a larger scale for making a more valid generalization.

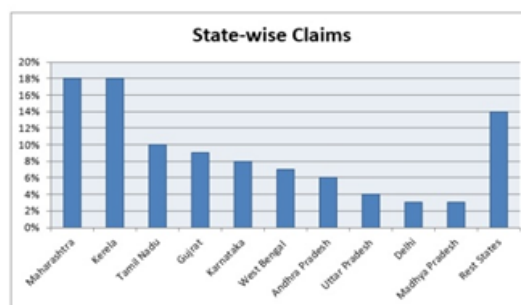
KEYWORDS :

Diabetes mellitus is a syndrome that embraces many etiologies and abnormalities that share hyperglycaemia as a common characteristic. Diabetic symptom may result from insulin deficiency or from insulin resistance that renders insulin ineffective.

Diabetes prevalence is increasing rapidly; previous 2013 estimates from the International Diabetes Federation put the number at 381 million people having diabetes. The number is projected to almost double by 2030. The WHO estimates that diabetes resulted in 1.5 million deaths in 2012, making it the 8th leading cause of death. Until recently, India had more diabetics than any other country in the world, according to the International Diabetes Foundation, although the country has now been surpassed in the top spot by China. Diabetes currently affects more than 62 million Indians, which is more than 7.1% of the adult population. The average age on onset is 42.5 years. Nearly 1 million Indians die due to diabetes every year. According to the Indian Heart Association, India is projected to be home to 109 million individuals with diabetes by 2035.

Source: - www.who.int/diabetes/facts/world_figures/en**Fig 1:- The worldwide prevalence of diabetes in 2000**

In India, one out of 10 people in Tamil Nadu is diabetic, and every two persons in a group of 25 are in the pre-diabetic stage.

Source: - <http://fpindia.in/blog/wp-content/uploads/2017/02/State-wise-1.jpg>**Fig 2:- State wise prevalence of diabetes in India in 2002**

Insulin is a very potent substance and must be used with caution. An error in dosage, time, frequency and technique of administration of insulin may prove serious. A nurse, who plays a key role in health care delivery system, has the entire responsibility to supervise, guide and motivate the diabetic patients on their knowledge, practice and technique of self-administration of insulin.

The investigator during her interaction with the patient while working in community/hospital in Tamilnadu had identified the gap in knowledge and practice in regard to self-administration of insulin. Further she could identify various studies among diabetic patients (e.g. health status, foot care, complication) except a few studies about structured teaching programme regarding self-administration of insulin. Therefore she had opted the challenge to take up this study.

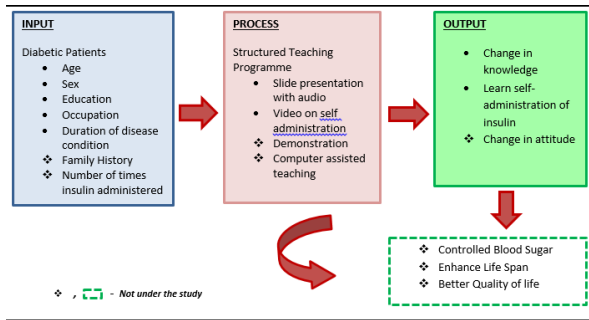
Objectives

1. To assess the existing level of knowledge regarding self-administration of insulin among insulin requiring diabetic patients before and after structured teaching programme.
2. To assess the existing practice regarding self-administration of insulin among insulin requiring diabetic patients before and after structured teaching programme.

- To find the association between selected background factors of insulin requiring diabetic patients and the level of knowledge and practice regarding self-administration of insulin.

Conceptual Framework

The Systems Theory introduced by Karl Ludwig von Bertalanffy had been applied in this study.

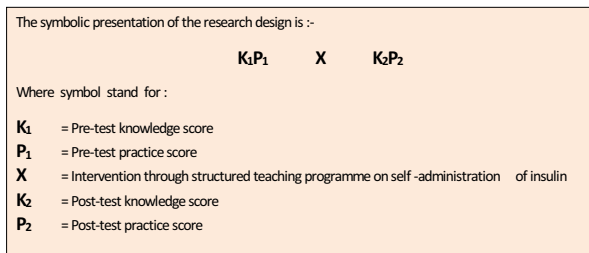


Methods and Procedure:

To find the effectiveness of an intervention, an evaluatory approach will be the best suited. In this study, the investigator desired to evaluate the effectiveness of a structured teaching programme on self-administration of insulin among insulin requiring diabetes patients.

Research Design

Pre- experimental Research Design had been adopted by the investigator.



Variables

Independent variable was structured teaching programme on self-administration of insulin and the **Dependent variable** were (i) Knowledge on diabetes and self-administration of insulin and (ii) Practice on self-administration of insulin. **Background Variable** for each patient's age, sex, education, occupation and duration of disease condition are assessed and recorded.

Settings

In this study, outpatient department in Krithika Hospitals and Research Centre, Salem, Tamil Nadu, India was chosen to be the best setting.

Population

All the patients who were diagnosed as insulin requiring diabetes mellitus of both Type I and II.

Sample and Sample Size

In this study, the samples were insulin requiring diabetic patients of both Type I and II of Krithika Hospitals and Research Centre, Salem, Tamil Nadu, India. The sample size was 30, considering the availability of sample attended the OPD and as per inclusion criteria.

The Sampling Technique

The researcher considered non probability purposive sampling as sampling technique.

The following sample selection criteria are considered:-

Inclusion criteria

- Patients of both the sex
- Patients with age limit of 15 Year and above
- Patient who are not suffering from any complication

Exclusion criteria

- Patients with a temporary schedule of insulin
- Patients who were apprehensive about self-administration of insulin
- Patients who refused to participate in the study
- Patients who were administering insulin by Nova pen and insulin glass syringe

Validity and Reliability of the Tool

VARIABLES	TOOL	TECHNIQUE
Background data	Interview Schedule - Part A	Interviewing
Knowledge	- Part B	Interviewing
Practice	Observation Checklist	Observation

Validity:-The tool and the structured teaching programme were validated by five experts including three post graduate nurses and two medical experts. The items were evaluated for clarity, relevance and appropriateness. The items with 100% agreement were included in the structured interview schedule. Few items were modified and included. The tool was translated to Tamil by language experts. The tool was then retranslated into English and then the language validity of the tool was established. The audio visual aids used, were validated by four subject experts with regard to relevance, sequence and efficiency.

Reliability:-As a tool the researcher had used structured interview schedule and observation checklist. The reliability of the structured interview schedule was tested by test-re-test method. Reliability was computed using Karl Pearson's Correlation Coefficient method, $r = 0.89$. The reliability of observation check list was measured using interrater reliability. The coefficient of correlation was computed by using Karl Pearson's Correlation Coefficient method, $r = 0.78$. The reliability coefficient was found to be high. Thus the tools were found to be reliable for data collection.

Ethical Consideration:

Ethical consideration was taken into account from

- Institutional ethical committee
- Hospital authority - Director and Matron
- Consent was taken from the patient for participating in the research programme. The confidentiality of the patient was maintained while shooting for video show.

Final Data Collection Procedure:

In coordination with doctor written consent from the patients were taken. Pre-test knowledge was assessed through interview schedule. Pre-test practice was assessed by observation checklist first. Structured teaching was given to the patient through slide presentation. A demonstration on self-administration of insulin was given and return demonstration was taken. Patients were asked for any clarification. Because of language barrier help of translator and also video in Tamil was shown. Then the patient was instructed to come to OPD after 8 days and show self-administration of insulin in front of the investigator. Post-test knowledge on Diabetes mellitus and self-administration of insulin was assessed through interview. Post-test practice was assessed through observation checklist. At the end acknowledged the patient by thanksgiving. Like this 30 data were collected.

Results:

Background Variables

In this study, major background factors of insulin-requiring diabetic patients such as age, sex, education, occupation and duration of disease condition was considered.

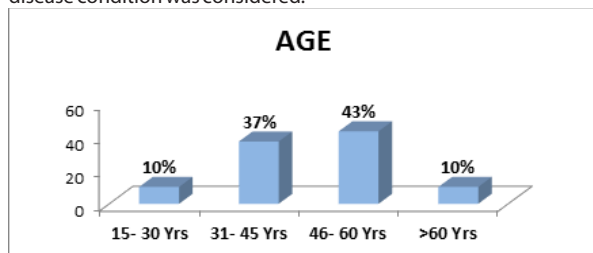


Fig 4 :- Percentage distribution of various age group among insulin requiring diabetes patients

Regarding age, majority of the insulin requiring diabetic patients 13(43%) belonged to the age group of 46-60 years. Least number of insulin requiring patients 3(10%) were in the age group of 60 years and above.

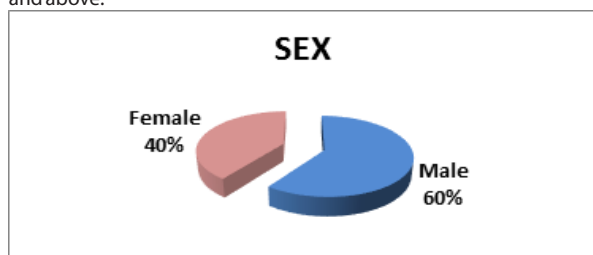


Fig 5 :- Percentage distribution of sex among insulin requiring diabetes patients

With regard to sex, majority of insulin requiring diabetic patients 18(60%) were males.

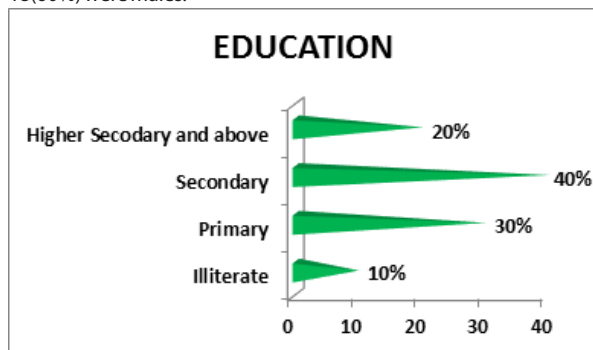


Fig 6 :- Percentage distribution of education level among insulin requiring diabetes patients

Regarding education, majority were literates and had secondary level of education 12(40%) and least number of insulin requiring diabetic patients were illiterates 3(10%).

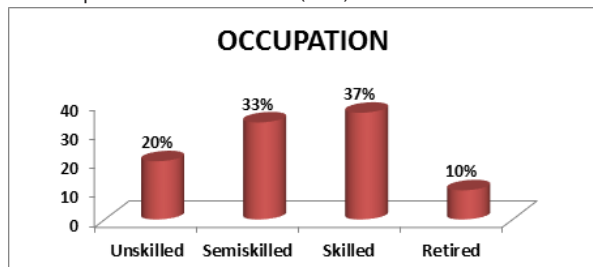


Fig 7 :- Percentage distribution of various occupational group among insulin requiring diabetes patients

Regarding occupation, majority of the insulin requiring diabetic patients 11(37%) were skilled workers.

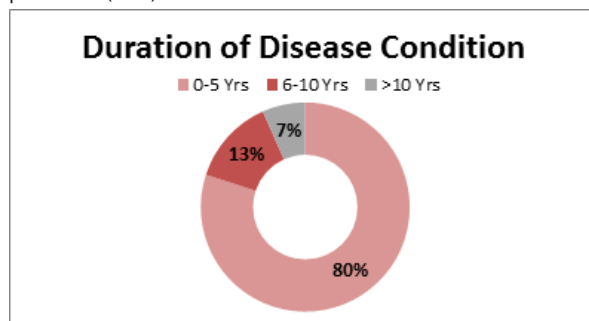


Fig 8 :- Percentage distribution of duration of disease condition among insulin requiring diabetes patients

With regard to duration of disease condition, majority of insulin requiring diabetic patients 24(80%) were taking insulin therapy since 0-5 years. Only 2 (7%) patient was practicing self-administration of insulin for more than 10 years.

It was inferred that, majority of insulin requiring diabetic patients were in the age group of 46 to 60 years, were males, were literates, were skilled, had duration of disease condition between 0 to 5 years.

Significant Difference Between Pre And Post Test Knowledge Score:-

It is revealed that majority of insulin requiring diabetic patients 15(50%) had overall inadequate knowledge and least of them 4(13%) had adequate knowledge regarding self-administration of insulin before the administration of structured teaching programme(pre-test). With regard to the areas of self-administration of insulin, majority 16(53%), 17(57%) and 16(53%) had inadequate knowledge regarding knowledge on insulin, administration of insulin and complication after insulin injection respectively. Regarding knowledge on diabetes, majority 14(47%) had adequate knowledge.

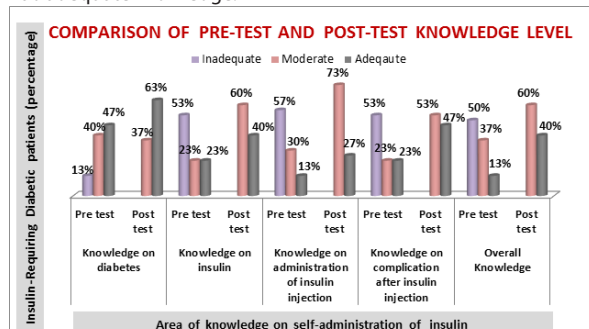


Fig 9 :- Comparison of pre-test and post-test score on knowledge among insulin requiring diabetes patients

In the **post-test**, majority of insulin requiring diabetic patients 11(37%), 18(60%), 22(73%) and 16(53%) reported moderate knowledge regarding knowledge on diabetes, insulin, administration of insulin injection and complication after insulin injection respectively. Regarding overall knowledge, majority of insulin requiring diabetic patients 18(60%) reported moderate and 12(40%) reported adequate knowledge. There was none (0%) who reported inadequate knowledge.

Hypothesis:-

H₁ - There will be a significant difference between pre-test and post-test knowledge level among insulin requiring diabetic patients regarding self-administration of insulin $K_1 \neq K_2$

H₀ - There will be no significant difference between pre-test and

post-test knowledge regarding self-administration of insulin among insulin requiring diabetic patients. $K_1 = K_2$

SIGNIFICANT DIFFERENCE BETWEEN PRE AND POST TEST KNOWLEDGE SCORE					
n= 30					
GROUP	LEVEL	MEAN KNOWLEDGE SCORE	MEAN DIFFERENCE	STANDARD DEVIATION (SD)	't' value
Insulin requiring Diabetic patients	Pre - test	11.13	2.83	2.43	12.3
	Post- test	13.97		1.59	
p< 0.05					

Table 1 shows significant difference between pre- test and post-test knowledge score

The Table on Overall Knowledge The mean difference between the pre-test and post-test knowledge was 2.83. The obtained 't' value 12.3 ($p < 0.05$) was significant. Hence the null hypothesis (H_{01}) was rejected and the research hypothesis (H_{11}) was accepted. There was significant difference in knowledge regarding self-administration of insulin before and after the administration of structured teaching programme. It was inferred that the knowledge was significantly increased after the structured teaching programme. Hence the structured teaching programme was found to be effective to enhance the knowledge of insulin requiring diabetic patients.

Significant Difference Between Pre And Post Test Practice Score:-

The data on frequency and percentage distribution on existing practice level among insulin requiring diabetic patients was also analysed. With regard to practice on self-administration of insulin, majority 16(53.3%) were having inadequate practice level.

Hypothesis:-

H_1 - There will be a significant difference between pre-test and post-test practice level among insulin requiring diabetic patients regarding self-administration of insulin. $P1 \neq P2$.

H_{02} - There will be no significant difference between pre-test and post-test practice regarding self-administration of insulin among insulin requiring diabetic patients. $P1 = P2$.

SIGNIFICANT DIFFERENCE BETWEEN PRE AND POST TEST PRACTICE SCORE					
n= 30					
GROUP	LEVEL	MEAN PRACTICE SCORE	MEAN DIFFERENCE (MD)	STANDARD DEVIATION (SD)	't' value
Insulin requiring Diabetic patients	Pre - test	16.73	5.23	2.21	25.2
	Post- test	21.97		2.38	
p< 0.05					

Table 2 shows significant difference between pre- test and post-test practice score

The Table no 2 shows the comparison between pre-test and post-test practice level. The improved mean was found to be 5.23. The 't' value 25.2 calculated was significant at 0.05 level. Hence the null hypothesis (H_{02}) was rejected and the research hypothesis (H_{12}) was accepted.

Therefore, it was inferred that there was a significant difference between pre-test and post-test practice level among insulin requiring diabetic patients. Hence the structured teaching programme was found to be effective to enhance practice score of insulin requiring diabetic patients.

Data On Association Of Background Variables On Post-Test Knowledge And Practice Level Regarding Self-Administration Of Insulin

The selected background factors considered by the researcher to

test the association with the knowledge and practice regarding self-administration of insulin were: age, sex, education, occupation and duration of disease condition. These background factors were compared with post-test knowledge and practice level and the association was tested among them by using chi-square test.

(A) ASSOCIATION WITH AGE

Table 3 shows association between age and post-test knowledge

ASSOCIATION BETWEEN AGE AND POST-TEST KNOWLEDGE					
AGE	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
15-30 Years	1	3.33	2	6.66	1.892
31-45 Years	8	26.66	3	10	
46-60 Years	7	23.33	6	20	
>60 Years	2	6.66	1	3.33	
p< 0.05					

The chi-square statistic was 1.892. The p-value was 0.595123. The result was statistically not significant at $p < 0.05$. There was no significant association between age and post-test knowledge among insulin requiring diabetic patients.

ASSOCIATION BETWEEN AGE AND POST-TEST PRACTICE					
AGE	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
15-30 Years	2	6.66	1	3.33	0.75
31-45 Years	7	23.33	5	16.66	
46-60 Years	9	30	3	10	
>60 Years	2	6.66	1	3.33	
p< 0.05					

Table 4 shows association between age and post-test practice

The chi-square statistic was 0.75. The p-value was 0.861385. The result was statistically not significant at $p < 0.05$. There was no significant association between age and post-test practice among insulin requiring diabetic patients.

(B) ASSOCIATION WITH SEX

ASSOCIATION BETWEEN SEX AND POST-TEST KNOWLEDGE					
SEX	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
Male	10	33.33	8	26.66	0.37
Female	8	26.66	4	13.33	
p< 0.05					

Table 5 shows association between sex and post-test knowledge

The chi-square statistic was 0.3704. The p-value was 0.542802. This result was statistically not significant at $p < 0.05$. There was no significant association between sex and post-test knowledge among insulin requiring diabetic patients.

ASSOCIATION BETWEEN SEX AND POST-TEST PRACTICE					
SEX	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
Male	11	36.33	7	23.33	0.625
Female	9	30	3	10	
p< 0.05					

Table 6 shows association between sex and post-test practice

The chi-square statistic was 0.625. The p-value was 0.429195. This result was statistically not significant at $p < 0.05$. There was no significant association between sex and post-test practice among insulin requiring diabetic patients.

(C) ASSOCIATION WITH EDUCATION

ASSOCIATION BETWEEN EDUCATION AND POST-TEST KNOWLEDGE					
EDUCATION	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
Illiterate	2	6.66	1	3.33	0.602
Primary	5	16.66	4	13.33	
Secondary	8	26.66	4	13.33	
Higher secondary and above	3	10	1	10	
p < 0.05					

Table 7 shows association between education and post-test knowledge

The chi-square statistic was 0.6019. The p-value was 0.896008. The result was statistically not significant at $p < 0.05$. There was no significant association between education and post-test knowledge among insulin requiring diabetic patients.

Table 8 shows association between education and post-test practice

ASSOCIATION BETWEEN EDUCATION AND POST-TEST PRACTICE					
EDUCATION	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
Illiterate	2	6.66	1	3.33	9.125
Primary	8	26.66	1	3.33	
Secondary	9	30	3	10	
Higher secondary and above	1	3.33	5	16.66	
p < 0.05					

The chi-square statistic was 9.125. The p-value was 0.027674. The result was statistically significant at $p < 0.05$. There was significant association between education and post-test practice among insulin requiring diabetic patients.

(D) ASSOCIATION WITH OCCUPATION

ASSOCIATION BETWEEN OCCUPATION AND POST-TEST KNOWLEDGE					
EDUCATION	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
Unskilled	5	16.66	1	3.33	4.394
Semiskilled	7	23.33	3	10	
Skilled	4	13.33	7	23.33	
Retired	2	6.66	1	3.33	
p < 0.05					

Table 9 shows association between occupation and post-test knowledge

The chi-square statistic was 4.3939. The p-value was 0.221948. The result was statistically not significant at $p < 0.05$. There was no significant association between occupation and post-test knowledge among insulin requiring diabetic patients.

Table 10 shows association between occupation and post-test practice

ASSOCIATION BETWEEN OCCUPATION AND POST-TEST PRACTICE					
EDUCATION	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
Unskilled	4	13.33	2	6.66	1.5273
Semiskilled	8	26.66	2	6.66	
Skilled	6	20	5	16.66	
Retired	2	6.66	1	3.33	
p < 0.05					

The chi-square statistic was 1.5273. The p-value was 0.67599. The result was statistically not significant at $p < 0.05$. There was no significant association between occupation and post-test practice among insulin requiring diabetic patients.

(E) ASSOCIATION WITH DURATION OF DISEASE CONDITION

ASSOCIATION BETWEEN DURATION OF DISEASE CONDITION AND POST-TEST KNOWLEDGE					
DURATION OF DISEASE CONDITION	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
0- 5 Years	15	50	9	30	0.313
6-10 Years	2	6.66	2	6.66	
> 10 Years	1	3.33	1	3.33	
p < 0.05					

Table 11 shows association between duration of disease condition and post-test knowledge

The chi-square statistic was 0.3125. The p-value was 0.855345. The result was statistically not significant at $p < 0.05$. There was no significant association between duration of disease condition and post-test knowledge among insulin requiring diabetic patients

ASSOCIATION BETWEEN DURATION OF DISEASE CONDITION AND POST-TEST PRACTICE					
DURATION OF DISEASE CONDITION	Moderate		Adequate		Chi - square' χ^2 ' Value
	n	%	n	%	
0- 5 Years	16	53.33	8	26.66	0.375
6-10 Years	3	10	1	3.33	
> 10 Years	1	3.33	1	3.33	
p < 0.05					

Table 12 shows association between duration of disease condition and post-test practice

The chi-square statistic was 0.375. The p-value was 0.829029. The result was statistically not significant at $p < 0.05$. There was no significant association between duration of disease condition and post-test practice among insulin requiring diabetic patients

Discussion:

Study findings revealed that majority of the insulin requiring diabetic patients 15 (50%) had inadequate knowledge and 16 (53%) had inadequate existing practice level regarding self-administration of insulin. The study revealed that exposure to structured teaching programme had caused significant difference in knowledge ('t' value 12.3) and practice ('t' value 25.3) level among insulin requiring diabetic patients.

The findings were supported by the study done by Howorka K¹ et al (2000) on "Empowering diabetes out-patients with structured education: short-term and long-term effects of functional insulin treatment on perceived control over diabetes". J Psychosom Res. 2000 Jan;48(1):37-44. To evaluate effects of FIT (FIT: selective insulin dosages for eating, fasting or correcting hyperglycaemia) on "Perceived Control over Diabetes" and related "Health Beliefs Concerning Diabetes" (Bradley's questionnaires, 1984), a fully randomized short-term controlled Study 1 (four weeks, 32 patients), and long-term uncontrolled pilot Study 2 (three years, 68 patients) were performed.

Further, the findings were supported by the study done by Rönnemaa T¹ et al (1997) on "Evaluation of the impact of podiatrist care in the primary prevention of foot problems in diabetic subjects" [Diabetes Care. 1997 Dec;20(12):1833-7]. Patients had greater improvement in knowledge of diabetic foot care ($P = 0.004$) and self-care ($P < 0.001$) scores compared with control subjects. The study concluded that education and primary preventive measures provided individually by a podiatrist result in significant improvements in knowledge and foot self-care scores and in improvements in the prevalence of some minor foot problems.

In India, the study done by Viswanathan V¹ et al (1999) of Diabetes Research Centre, Royapuram, Chennai on "Need for education on foot care in diabetic patients in India" had been conducted on 250 patients from the out-patient department of the hospital. A

questionnaire was filled up for each patient by personal interview. The total score was 100 and a score of < 50 was considered as a low score for foot care knowledge. A score of < 50 was obtained in 67.2%. Low score was more common in women (78.5%) than in men (62.5%) ($\chi^2 = 5.26$, $P = 0.022$). Low scores (< 50) were more common among those with lower level of formal education ($\chi^2 = 70.0$, $P < 0.0001$). In general the scores on awareness of general foot care principles and basic facts about the foot complications were poor.

Recommendation:

A similar study can be undertaken on a larger scale for making a more valid generalization; on other aspects of self-care management of diabetes like foot care, eye care, diet control etc. A similar study with teaching instruction regarding self-administration of insulin by Nova pen A or to find the attitude and practice level can be conducted. Other methods of teaching can be adopted to teach the patient on self-administration of insulin.

Implication:

The implications of the findings had been discussed in relation to nursing service, nursing education, nursing administration and nursing research. The structured teaching programme could act as a guideline for the nursing personnel to give health-education to patients. The findings of the study served as a basis for the nursing professional and the students to conduct further studies, in different aspects of diabetes like drug compliance, diet, exercise, foot care, prevention of complications.

Conclusion:

The study findings has concluded that the existing level of knowledge and practice on self-administration of insulin was inadequate among insulin requiring diabetic patients. Exposure to the structured teaching programme increased the knowledge and practice level among insulin requiring diabetic patients which would help them for an effective diabetes management.

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