



## Impact of Educational Intervention by Nurses on Self Administration of Insulin among Insulin Dependent Diabetes Mellitus Patients in Selected Hospitals at Bathinda District

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### Abstract

**Background of Study:** Diabetes mellitus is a multisystem disease related to abnormal insulin production, impaired insulin utilization or both. Diabetes mellitus is a serious health problem throughout the world. Insulin-dependent diabetes mellitus client multiple daily doses of insulin need to be injected into the subcutaneous tissue to achieve glycemic control, which has been shown to be an essential condition to prevent acute and chronic complications of this disease. So this study to assess the Effectiveness of planned teaching on self-administration of insulin for patients with Insulin Dependent Diabetes Mellitus, receiving insulin through subcutaneous route in selected hospital of Bathinda District, Punjab.

**Material and Method:** The Quantitative research approach is adopted and Pre-experimental one-group pre-test post-test design was used. The study sample size total 200 Insulin Dependent Diabetes Mellitus Patients, receiving insulin through subcutaneous route in selected hospital of Bathinda District, Punjab. Non probability convenient sampling method was used to select the sample for the study. **Results:** Pre-Test Knowledge majority of 117(58.5%) had average knowledge scores and rest of 68(34.0%) had Below Average Knowledge and 15 (7.5%) Good Knowledge regarding self-administration of insulin. Post - Test Knowledge majority of 165(82.5%) had Good Knowledge scores and rest of 35(17.5%) had Average Knowledge and 0 (0%) below average knowledge regarding self-administration of insulin. Pre-test knowledge mean score 1.74 Standard Deviation was 0.589. Post-test knowledge means score 2.83 Standard Deviation was 0.381. Mean differences and DF 199. The t calculated value 21.491. There is a significant difference between Pre-test knowledge and Post-test knowledge scores ( $t=21.491$ ,  $p<0.001$ ). **Conclusion:** The insulin dependent diabetic patient has inadequate knowledge and hence by teaching strategy and the pamphlet which is distributed regarding insulin dependent diabetes was more effective for the clients.

Thus in future this kind of study can be replicated to the large group of sample and in the community setting also.

**Key Word-** Diabetes Mellitus, Insulin Dependent Diabetes Mellitus, Self-Administration of Insulin.

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## INTRODUCTION

Diabetes mellitus is a multisystem disease related to abnormal insulin production, impaired insulin utilization or both.

Diabetes is a disorder characterized by hyperglycemia or elevated blood glucose (blood sugar). Our bodies function best at a certain level of sugar in the bloodstream. If the amount of sugar in our blood runs too high or too low, then we typically feel bad. Diabetes is the name of the condition where the blood sugar level consistently runs too high. Diabetes is the most common endocrine disorder. Sixteen million Americans have diabetes, yet many are not aware of it. Americans have a higher rate of developing diabetes during their lifetime. Diabetes has potential long term complications that can affect the kidneys, eyes, heart, blood vessels, and nerves.

There are two types of diabetes mellitus type 1 and type 2. The term "type 1 diabetes" has replaced several former

terms, including childhood onset diabetes, juvenile diabetes, and insulin-dependent diabetes mellitus (IDDM). Likewise, the term "type 2 diabetes" has replaced several former terms, including adult-onset diabetes, obesity-related diabetes, and noninsulin-dependent diabetes mellitus (NIDDM).

The body is made up of millions of cells. All cells need glucose (sugar) from the food we eat for energy. Just as a car can't run without gasoline, the body can't work without glucose. Insulin is the "key" that allows glucose to enter the cells. Without this key, glucose stays in the bloodstream and the cells can't use it for energy. Instead, the glucose builds up in the blood and spills over into the urine.

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When a person develops type I diabetes, the pancreas stops making insulin. To help the body's cells use the glucose, a child with type 1 diabetes mellitus (DM) must receive insulin by injection (shot).

Around 150 Million peoples suffered from diabetes in the World, out of that above 35 million are Indians are the highest in the world, so it is called Diabetic capital of world. Every fifth person who suffers from diabetes in the world today is an Indian. By 2030 Indian will have 79.4 Million diabetic projects of WHO (World Health Organization) that's more than twice the current number over 35 million cases. No wonder India is the "Diabetic Capital of the World".

**India Today Web Desk** (November 22, 2018) Nearly 98 million people in India may have type 2 diabetes by 2030, according to a study published The study, published in the 'lancet diabetes & endocrinology' journal, found that the amount of insulin needed to effectively treat type 2 diabetes will rise by more than 20 per cent worldwide over the next 12 years. Without major improvements in access, insulin will be beyond the reach of around half of the 79 million adults with type 2 diabetes who will need it in 2030, said researchers from Stanford University in the USA. **Kaniz Fatema, Sharmin**

**Hossain, Khurshid Natasha, et al** (2017)- According to researcher Increased awareness amongst large population groups is a major determinant for the prevention of diabetes and its complications as well as related metabolic disorders. The present study was undertaken to explore knowledge, attitude and practice (KAP) regarding -diabetes mellitus (DM) among non diabetic (non DM) and type 2 diabetes mellitus (T2DM) patients in Bangladesh. A cross-sectional study was conducted among 18,697 adults (aged 18 years and above; 7796 male and 10,901 female; 6780 non DM and 11,917 T2DM) selected purposively from the OPD of 19 healthcare centres in and around Dhaka and in northern parts of Bangladesh. KAP were assessed by a pre-structured, interviewer-administered questionnaire. The overall level of knowledge and practice concerning diabetes among Bangladeshi population is average, but the overall level of attitude is good both in non DM and T2DM subjects. To prevent diabetes and its complications there is an urgent need for coordinated educational campaigns with a prioritized focus on poorer, rural and less educated groups<sup>21</sup>.

### **Statement of the Problem**

A study to assess the Effectiveness of planned teaching on self-administration

of insulin for patients with Insulin Dependent Diabetes Mellitus, receiving insulin through subcutaneous route in selected hospital of Bathinda District, Punjab.

### **Objectives of the Study**

1. To assess the knowledge on self-administration of insulin through subcutaneous route among patients with insulin dependent diabetes mellitus before the planned teaching as measured by structured questionnaire.
2. To plan and implement the planned teaching.
3. To evaluate the impact of planned teaching on self-administration of insulin for patients with diabetes mellitus receiving insulin through subcutaneous route in terms of gain in knowledge.
4. To compare knowledge score with various demographic variables.

### **Hypothesis**

**H<sub>1</sub>:** The mean post-test knowledge score of patient with diabetes mellitus attending Individual Planned Teaching on self administration of insulin through subcutaneous route will be significantly higher than the mean pre-test knowledge score.

**H<sub>2</sub>:** There will be significant association between knowledge on self-administration of insulin and selected

socio demographic variables such as age, sex, education, economic status and duration of insulin therapy.

### **METHODOLOGY**

**Research approach:** The Quantitative research approach is used in this study.

**Research Design:** Pre-experimental one-group pre-test post-test design is used.

**Research Setting:** The present study was conducted in selected hospital of Bathinda District, Punjab.

**Population:** Population consisted of all insulin dependent patients with diabetes mellitus on insulin therapy and are admitted in various wards of all hospitals of India.

**Target Population:** Patients with diabetes mellitus on insulin therapy and is admitted in medical, surgical, orthopaedic, gynecology and other wards of all hospitals of Bathinda District, Punjab.

**Sample Size:** 200 Insulin Dependent Diabetes Mellitus Patients, receiving insulin through subcutaneous route.

**Sampling Technique:** Non Probability Convenient Sampling Technique

### **Development of Tool for Data Collection**

It consists of two parts. The researcher prepared a self structured knowledge questionnaire is used as a tool for the study. The self structured knowledge questionnaires consist of two parts:

**Part A:** It is designed to obtain general information of the respondents and it consists of twelve items related to the demographic variables of the insulin dependent diabetes mellitus.

**Part B:** It consists of thirty items regarding knowledge of insulin dependent diabetes patients regarding the knowledge on self administration of insulin through subcutaneous route.

**Validity:** The self structured knowledge questionnaire tool and STP were given to seven experts along with blue print, objectives, hypothesis and criteria checklist of the study.

**Reliability:** After obtaining the formal administrative permission, the tool was administered to 20 samples selected as per the set criteria. The scores were calculated and then given for statistical analysis. The reliability was established by using split half method.

**Data Collection Procedure:** A formal permission was obtained from the selected hospitals of Bathinda District. Data was collected January to February. After identifying the samples objective of study were discussed and consent for the participation in the study was taken from the selected groups. The investigator herself administered the questionnaire for the pre- test.

**Analysis of Data:** Both descriptive and inferential statistics analyzed on the basis of the objectives and hypothesis of the study. The knowledge of the patients regarding self administration of insulin with insulin dependent diabetes mellitus receiving insulin through subcutaneous route assessed before and after the administration of STP would be calculated using frequency, mean, and standard deviation and inferential statics used to analyze Paired 't' and chi square test. The data was also presented graphically and in the form of table.

## RESULTS

The analyzed data was organized according to the objectives and hypotheses presented under the following sections:

**Section I:** Demographic characteristics of the sample

**Section II:** Findings related to level of pre test and post test knowledge regarding experimental group regarding self-administration of insulin for patients with insulin dependent diabetes mellitus, receiving insulin through subcutaneous route.

**Section III:** Findings related to comparison of mean pre test and post test knowledge experimental group regarding self-administration of insulin for patients with insulin dependent diabetes mellitus,

receiving insulin through subcutaneous route.

**Section IV:** Association of pre test and post test levels knowledge regarding self-administration of insulin for patients with insulin dependent diabetes mellitus, receiving insulin through subcutaneous route with their selected socio demographic variables.

### **Section I: Description of the Demographic Variables of Sample**

- Majority of the subjects in Age (In Years) 20 – 40 years 109 (54.5%) and 40- 60 years 74(37.0%), 60 - 80 years 17 (8.5%) followed by Age (In Years) Mean 1.54 Standard deviation 0.64840.
- Majority of the Subjects Gender Male 116(58.0%) And Female 84(42.0%) followed by Gender Mean 1.42 Standard Deviation 0.495.
- Majority of the Subjects in Marital status Married 102 (51.0%) and Single 82(41.0%), Widow 8 (4.0%) Divorced 8(4.0%) followed by Marital status Mean 1.71 Standard Deviation 0.727
- Majority of the Subjects Education Status Secondary Education 86 (43.0%) Illiterate 16 (8.0%) Primary Education 28(14.0%) Graduate 55(27.5%) Postgraduate 15(7.5%) Followed By Education Status Mean 3.13 Standard Deviation 1.012.
- Majority of the Subjects in occupation Office employee 77(38.5%) and Unemployed 26 (13.0%) Laborer / coolie 47(23.5%) Self employed/ Business 50(25.0%) Followed By occupation. Mean 2.76, Standard Deviation 0.975.
- Majority of the Subjects in family income 10001 – 20000 854(2.5%) < 10000 25(12.5%) and 20001 – 30000 39(19.5%) and 30001 – 40000 38(19.0%) and >40000 13(6.5%) Followed By Family Income Mean 2.65 Standard Deviation 1.120.
- Majority of the Subjects in Dietary Habits Non-vegetarian 102 (51.0%) Vegetarian 84(42.0%) Egg vegetarian 14(7.0%) Followed By dietary habits Mean 1.65 Standard Deviation 0.608.
- Majority of the Subjects in Family History of Diabetes Mellitus Yes 116 (58.0%) No 84 (42.0%) Followed By Family History Of Diabetes Mellitus Mean 1.42 Standard Deviation 0.495.
- Majority of the Subjects in Duration of Illness Up to 5 years 78(39.0%) 6 – 10 years 35(17.5%), 11-15 years 52(26.0%) More than 15 years 35(17.5%) Followed by Duration of Illness Mean 2.22 Standard Deviation 1.144.
- Majority of the subjects in Are You on Insulin Therapy? Yes 152 (76.0%) No

48(24.0%) followed by Are You on Insulin Therapy? Mean 1.24, Standard deviation 0.428.

- Majority of the subjects’ in Duration of insulin treatment? 1–5 years 66(33.0%) 11–15 years 39(19.5%) less than1 year 26(13.0%) 6–10 years 33(16.5%) more than15 years 36(18.0%) followed by duration of insulin treatment? Mean 2.97 standard deviation 1.331.
- Majority of the subjects in Who Is Injection Insulin for You? Self 117(58.5%) family members23 (11.5%) Hospital staff 51(25.5%) others 9 (4.5%) followed by Who Is Injection Insulin for You? Mean 1.76, standard deviation 0.983.
- If Self, Have You Been Trained to Administer Insulin? Yes 81 (40.5%), No119 (59.5%).
- If No, Would You Like To Be Trained To Administer Insulin? Yes 113(94.9%) No 6(5.042%).

**Section II: Findings related to level of pre test and post test knowledge regarding experimental group regarding self-administration of insulin for patients with insulin dependent diabetes mellitus, receiving insulin through subcutaneous route.**

**Table no. 1:** Level of Pre-Test Knowledge of experimental group regarding self-

administration of insulin for patients N=200

S. NO	Pre-Test Level of Knowledge			
	Level of knowledge	Score	Frequency	%
1	Below Average Knowledge	< 15	68	34.0
2	Average Knowledge	16-22	117	58.5
3	Good Knowledge	23-30	15	7.5
	Total	0-30	200	100

**Table No. 2:** Level of Post-Test Knowledge of experimental group regarding self-administration of insulin for patients with insulin dependent diabetes mellitus, receiving insulin through subcutaneous route.

S. No	Post -Test Level of Knowledge			
	Level of knowledge	Score	Frequency	%
1	Below Average Knowledge	< 15	0	0
2	Average Knowledge	16-22	35	17.5
3	Good Knowledge	23-30	165	82.5
	Total	0-30	200	100

**Section III: Findings related to comparison of mean pre test and post test knowledge experimental group regarding self-administration of insulin**

for patients with insulin dependent diabetes mellitus, receiving insulin through subcutaneous route.

Since  $p < 0.001$ , this mean there is significant difference between pre-test and post-test knowledge score.

**Table No: 3** Comparison of Pre-Test and Post-Test Knowledge Scores Of Experimental Group Regarding Self-Administration of Insulin

Groups	Pre-test	Post-test
Mean	1.74	2.83
S. D.	0.589	0.381
Mean Diff	1.09	
DF	199	
paired 't' test	21.491	
Signification	Significant	

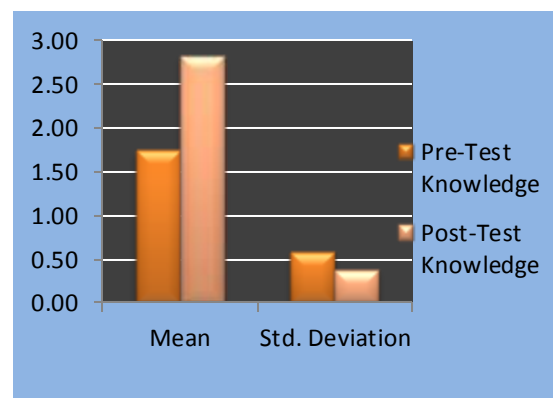


Figure No:1: Mean and SD of Pre-test and Post test mean score

**Section IV:** Association of pre test and post test levels knowledge regarding self-administration of insulin for patients with insulin dependent diabetes mellitus, receiving insulin through subcutaneous route with their selected socio demographic variables.

**Table No. 4** Association of pre test and post test levels knowledge

S . N o	Socio demographic Variables		Pre Test levels knowledge (n)=200			Df	chi-square	Table value at 5%	Significant
			Below Average	Average	Good				
			F	F	F				
1	Age	20 - 40	36	69	4	4	7.044	9.49	NS
		40 - 60	28	37	9				
		60 - 80	4	11	2				
2	Gender	Male	36	70	10	2	1.338	5.99	NS
		Female	32	47	5				
3	Marital status	Single	28	48	6	6	2.67	12.5	NS
		Married	34	60	8				
		Widowed	2	6	0				
		Divorced	4	3	1				
4	Education Status	Illiterate	1	13	2	8	13.38	15.5	NS
		Primary education	7	17	4				
		Secondary	38	43	5				



		education							
		Graduate	16	36	3				
		Postgraduate	6	8	1				
5	Duration of illness	Up to 5 years	0	11	67	3	2.264	7.82	NS
		6 – 10 years	0	9	26			at 5% level	
		11 – 15 years	0	9	43				
		More than 15 years	0	6	29				
6	Dietary habits	Vegetarian	0	15	69	2	1.428	5.99	NS
		Non-vegetarian	0	16	86			at 5% level	
		Egg vegetarian	0	4	10				
7	Who is injecting insulin for you?	Self	0	20	97	3	0.425	7.82	NS
		Family members	0	4	19			at 5% level	
		Hospital staff	0	10	41				
		Others	0	1	8				
8	Duration of insulin treatment?	Less than 1 year	0	3	23	4	2.386	9.49	NS
		1 – 5 years	0	12	54			at 5% level	
		6 – 10 years	0	8	25				
		11 – 15 years	0	5	34				
		More than 15 years	0	7	29				
9	F/H DM II	Yes	36	71	9	2	1.085	5.99	NS
		Family members	9	13	1				
		Hospital	14	36	1				

	staff							
	Others	3	5	1				

The data presented in table shows association of post test knowledge score with demographic variables at 0.05 significant levels. In the experimental group it is elicited from the post test chi square value of the age was,  $\chi^2= 6.257$ , family history of diabetes mellitus  $\chi^2= 3.993$ , which was more than the table value at  $p>0.5$  in experimental group. Hence, there is significant statistical association between the levels knowledge regarding self-administration of insulin for patients with insulin dependent diabetes mellitus, receiving insulin through subcutaneous route with their Age in year and Family history of diabetes mellitus, this selected socio demographic variables.

The experimental group it is elicited from the post test chi square value of the Gender  $\chi^2= 3.14$ , marital status  $\chi^2= 4.584$ , education status  $\chi^2= 5.457$ , occupation  $\chi^2= 2.894$ , family income  $\chi^2= 0.833$ , dietary habits  $\chi^2= 1.428$ , duration of illness  $\chi^2= 2.264$ , Are you on insulin therapy?  $X^2= 0.372$ , Duration of insulin treatment?  $X^2= 2.386$ , who is injection insulin for you?  $X^2= 0.425$  which was less than the table value at  $p>0.5$  in experimental group. Hence, there is no significant statistical association between the levels knowledge regarding self-

administration of insulin for patients with insulin dependent diabetes mellitus, receiving insulin through subcutaneous route with their. Gender, Marital status, Education status, Occupation, Monthly income (in rupees), Dietary habits, Duration of illness, Are you on insulin therapy? , Duration of insulin treatment?, Who is injecting insulin for you? This selected socio demographic variables.

### CONCLUSION

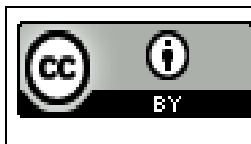
The insulin dependent diabetic patient has inadequate knowledge and hence by teaching strategy and the pamphlet which i distributed regarding insulin dependent diabetes was more effective for the clients. Thus in future this kind of study can be replicated to the large group of sample and in the community setting also.

### Recommendation

1. A similar study can be conducted with larger sample.
2. A similar study can be carried out to assess the knowledge, attitude and practices of self-administration of insulin.
3. A similar study can be carried different site and setting.
4. A study can be conducted with group i.e. experimental group and control group comparison.

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