

**A study to assess the impact of structured teaching programme on knowledge and skill regarding self-administration of Insulin (SAI) among Diabetes mellitus patients admitted in a tertiary care hospital of Srinagar Kashmir**

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**Abstract:** Introduction: Insulin is a valuable drug for those who need it. Insulin will have tremendous impact, when used properly. Intensive insulin therapy is essential in the maintenance of strict glycemic control among insulin requiring patients with diabetes. However, this presents challenges in the face of the complexities associated with insulin use and taking in the consideration the potential danger associated with inappropriate use. Insufficient knowledge and skill of self-administration of insulin can result in preventable complication, adverse patient outcome, poor adherence to therapy and invariably poor glycemic control. The study was conducted with the aim to assess the impact of structured teaching programme on knowledge and skill regarding self-administration of Insulin (SAI) among Diabetes mellitus patients in a tertiary care hospital of Srinagar Kashmir. Identifying the knowledge and skill of diabetes mellitus patients will help to assess the degree of awareness about self-administration of insulin so that recommendation can be made to arrange a teaching programme to educate the patients regarding self-administration of insulin so to incredibly enhance the knowledge and skill of diabetes mellitus patients regarding self-administration of insulin.

### Methodology

Quantitative research approach with pre-experimental pre-test Post-test design was used to assess the knowledge and skill regarding self-administration of Insulin (SAI) among Diabetes mellitus patients in endocrinology ward of SKIMS Soura. Purposive sampling technique was used to collect data from the 50 subjects who fulfilled the inclusion criteria. Data was collected using structured interview schedule and observational checklist.

### Results

The mean  $\pm$  SD post-interventional knowledge score ( $27.96 \pm 4.187$ ) was found to be higher than mean  $\pm$  SD pre-interventional knowledge score ( $15.74 \pm 4.232$ ) which was found to be statistically significant ( $P=0.001$ ) at 0.05 level of significance. The result also revealed that there was significant association between the pre-interventional knowledge score and demographic variables (Gender ( $p=0.012$ ), Educational Qualification ( $p=0.005$ ), Occupation ( $0.000$ ), Time duration of insulin therapy ( $0.006$ )). Whereas no significant association between the pre-interventional knowledge score and other demographic variable (age ( $p=0.186$ )).

Whereas the mean  $\pm$  SD post-interventional skill score ( $18.36 \pm 1.174$ ) was found to be higher than mean  $\pm$  SD pre-interventional skill score ( $10.16 \pm 3.17$ ) which was found to be statistically significant ( $P=0.001$ ) at 0.05 level of significance. The results also revealed that there was no significant association between the pre-interventional skill scores and demographic/clinical variables such as age, gender, educational qualification, occupation, and time duration of insulin therapy.

### Conclusion

The findings of the study concluded that the diabetes mellitus patients lack adequate knowledge and skill regarding self-administration of insulin and there is a need for educating the patients. The mean knowledge and skill scores improved after implementation of the structured teaching program indicating that the structured teaching program

was effective in increasing the knowledge and skill scores of Diabetes Mellitus Patients regarding self-administration of insulin.

**Keywords:** Impact; Structured teaching programme; Knowledge; Skill; Diabetes mellitus

## INTRODUCTION AND BACKGROUND OF THE STUDY

Diabetes mellitus is a group of metabolic diseases characterized by increased levels of glucose in the blood (hyperglycaemia) resulting from defects in insulin secretion, insulin action, or both (American Diabetes Association [ADA], 2009).<sup>1</sup> Globally, an estimated 422 million adults are living with diabetes mellitus, according to the latest data from the World Health Organization (WHO) 2016.<sup>2</sup> As of 2015, an estimated 415 million people had diabetes worldwide, with type 2 Diabetes Mellitus making up about 90% of the cases and Type 1 diabetes makes up an estimated 5-10% of all diabetes cases. This represents 8.3% of the adult population, with equal rates in both women and men.<sup>6</sup> Diabetes prevalence is increasing rapidly; previous estimates from the International diabetes federation (IDF) in 2013 put the number at 381 million people having diabetes.<sup>3</sup> the number is projected to almost double by 2030.<sup>4</sup>

Ahmad J. et al. in 2011, evaluated the prevalence of diabetes mellitus in Kashmir was 6.05%, with known diabetes mellitus being 4.03% of the study population and undiagnosed diabetes mellitus being 2.02% study population. This is higher than the findings of earlier studies from same area by Bhat NA et al and Zargar AH et al, in which prevalence was 2.02% and 1.89% respectively.<sup>5</sup>

The treatment for diabetes mellitus includes administration of Oral hypoglycaemic agents, insulin therapy and lifestyle modification. The need to use exogenous insulin to maintain good metabolic control has been increasingly acknowledged as a therapeutic option for both type 1 and type 2 diabetes mellitus. Considering the risk involved in inappropriate insulin use, attention to evaluating knowledge of insulin use is important because nowadays insulin requiring diabetes patients are encouraged to own insulin delivery kits to ensure timely administration of insulin. The diabetes patients who are on insulin need to be knowledgeable regarding the disease and they must have a competency towards self-administration of insulin injection to overcome the barriers of insulin injection and to have a good glycaemic control.<sup>6</sup>

In the context of the findings of above studies and investigators personal experience, the investigator felt the need for the present study to be carried out to assess knowledge and skill of Diabetes Mellitus Patients regarding the self-administration of Insulin and to establish the professional responsibility in providing structured teaching programme on insulin self-administration.

### OBJECTIVES OF THE STUDY:

1. To assess the pre-interventional knowledge score regarding Self Administration of Insulin among Diabetes mellitus patients.
2. To identify the post-interventional knowledge score regarding Self Administration of Insulin among Diabetes mellitus patients.
3. To evaluate the impact of structured teaching programme by comparing pre and post-interventional knowledge scores regarding Self Administration of Insulin among Diabetes mellitus patients.
4. To find out the association of pre-interventional knowledge scores regarding Self Administration of Insulin among diabetes mellitus patients with their selected demographic/clinical variables (age, gender, educational qualification, occupation and time duration of insulin therapy).
5. To assess the pre-interventional knowledge score regarding Self Administration of Insulin among Diabetes mellitus patients.
6. To identify the post-interventional knowledge score regarding Self Administration of Insulin among Diabetes mellitus patients.
7. To evaluate the impact of structured teaching programme by comparing pre and post-interventional knowledge scores regarding Self Administration of Insulin among Diabetes mellitus patients.
8. To find out the association of pre-interventional knowledge scores regarding Self Administration of Insulin among diabetes mellitus patients with their selected demographic/clinical variables (age, gender, educational qualification, occupation and time duration of insulin therapy).

### HYPOTHESES:

**H<sub>1</sub>:** There is significant increase in the post-interventional knowledge score as compared to pre- interventional knowledge score regarding Self Administration of Insulin among diabetes mellitus patients at 0.05level of significance.

**H<sub>2</sub>:** There is significant association between pre-interventional knowledge score regarding Self Administration of Insulin among diabetes mellitus patients with their selected demographic/clinical variables (age, gender, educational qualification, occupation and time duration of insulin therapy) at 0.05level of significance.

**H<sub>3</sub>:** There is significant increase in the post-interventional skill score as compared to pre- interventional skill score regarding Self Administration of Insulin among diabetes mellitus patients at 0.05level of significance.

**H<sub>4</sub>:** There is significant association between pre-interventional skill score regarding Self Administration of Insulin among diabetes mellitus patients with their selected demographic/clinical variables (age, gender, educational qualification, occupation and time duration of insulin therapy) at 0.05level of significance.

**MATERIAL AND METHODS:**

**Research approach and design:** A Pre- experimental one group pre-test and post-test design was used for the study.

**Table 1: Schematic Representation of the Research Design**

Group (N=50)	Pre-Intervention (day 1) (O <sub>1</sub> )	Intervention (day 1) (X)	Post)-Intervention (day 3) (O <sub>2</sub> )
Diabetes mellitus patients (Endocrinology ward of SKIMS Soura)	Pre-interventional knowledge and skill assessment of diabetes mellitus patients regarding self-administration of insulin through implementation of “structured Interview schedule and Observation checklist”.	Administration of “Structured teaching Programme” regarding self-administration of insulin. (Lecture cum demonstration)	Post-interventional knowledge and skill assessment of diabetes mellitus patients regarding self-administration of insulin through implementation of “structured Interview schedule and Observation checklist”.

**Sample and Sampling technique:** The sample for the present study is comprised of 50 diabetes mellites patients admitted in endocrinology ward of SKIMS hospital Srinagar from 14-03-2018 to 21-04-2018. The purposive sampling technique was adopted to select the sample for the present study.

**Description of the tool:**

Structured interview schedule and observational checklist was used as the research tool.

Structured interview schedule divided in two sections:

**Section 1:** Demographic data related to diabetes mellites patients includes; age, gender, educational qualification, Occupation and time duration of insulin therapy.

**Section 2:** Deals with knowledge assessment regarding self-administration of insulin includes:

Items related to concept of Diabetes mellitus, insulin therapy, technique of self-administration of insulin injection, complications and precautions of insulin administration.

**Section 3:** Observational checklist for assessing skill regarding self-administration of insulin includes 20 items.

**Data collection procedure:**

The data collection was done in two sessions-Mornings (8am to 12:30 pm) and Evening (2 pm to 5.30 pm) the following steps were followed for data collection:

**Administration of Pre-intervention:** After taking informed consent, the data was collected individually from the subjects through 30 itemed structured interview schedule and 20 itemed observational checklist which took an average of 25-30 minutes and 5-7 minutes respectively per subject.

**Intervention:** Structured Teaching Programme was given individually to subjects at bedside after a break of 10 minutes to each subject. The time for intervention was 45-55 minutes per subject for structured interview schedule and 10-15 minutes per subject for demonstration. The whole structured Teaching Programme was explained through comprehensive explanation and discussion in local i.e. Kashmiri language with the help of pictures shown from flip book and demonstration.

**Administration of Post-intervention:** The subjects were post-tested on every 3<sup>rd</sup> day of intervention following the same procedure as in the pre-intervention. The time duration for the post-intervention per subject was 30-35 minutes and 10-15 minutes for structured interview schedule and observational checklist respectively.

**Ethical considerations:**

The researcher has taken permission from the parent institution (Sher-I-Kashmir Institute of Medical Science and Madre-e-Meharban Institute of Nursing Sciences and Research) to conduct research study and ethical clearance was obtained and study was found ethically exempted

**RESULTS OF PRESENT STUDY**

The results of the present study are presented in the following sections.

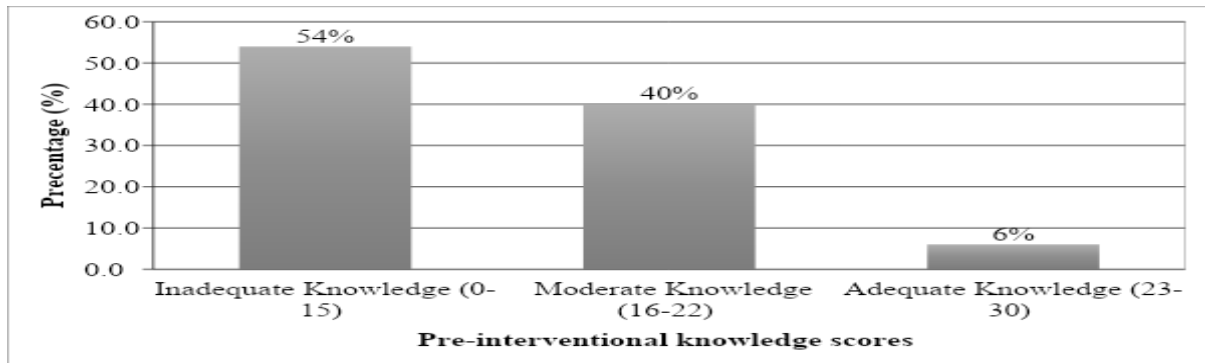
**SECTION 1: Description of demographic variables of study subjects.**

Out of 50 study subjects 24% were in the age group of 50-59 years, 22% were in the age group of 40-49, 20% were in the age group of 30-39 years, 12% in the age groups of 20-29 years and >59 years in each and least number of subjects i.e. 10% were in the age group of <20years. Majority of the study subject's i.e.72% were females and 28% were males. Majority of the study subjects i.e. 22% had education of middle level, 20% had education of secondary level, 20% were graduate, 18% were illiterate, 14% had education of secondary level and only a minimum number of study subjects i.e. 6% had qualification of post-graduate level. Highest numbers of study subjects i.e. 88% were Non-health related (housewives, govt. employees, and businessman) and lowest numbers of study subjects i.e. 12% were health related. Most of the study subjects i.e. 56% had been on insulin therapy for <1 year, 34% had been on insulin therapy for 1-5 years, and 10% of study subjects had been on insulin therapy for >5years.

**SECTION 2: Knowledge scores regarding self-administration of insulin**

**2.1. Description of Pre-interventional knowledge scores of study subjects regarding self-administration of insulin.**

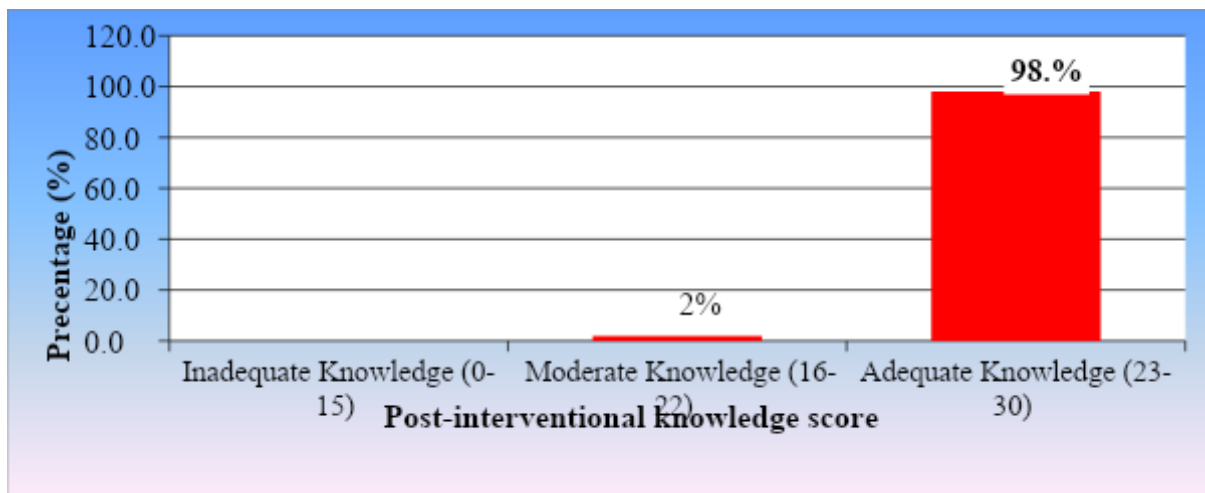
**Figure 1: Frequency and percentage distribution of pre-intervention knowledge scores of study subjects**



Majority of the study subjects i.e. 54% had inadequate knowledge, while as 40% subjects had moderate knowledge and 6% subjects had adequate knowledge.

**2.2. Description of Post-interventional knowledge scores of study subjects regarding self-administration of insulin.**

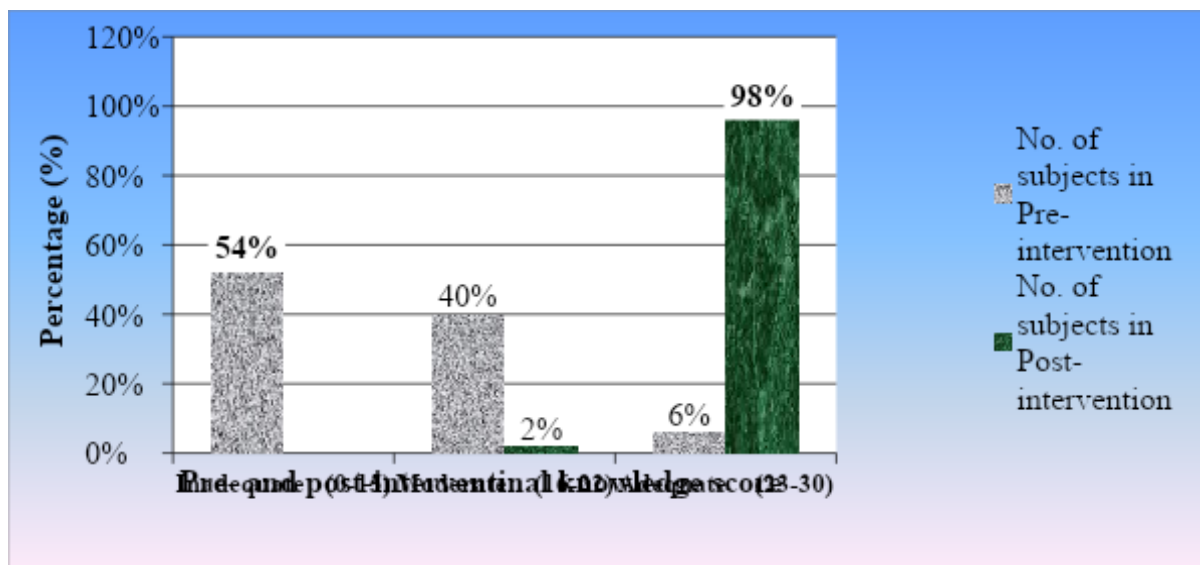
**Figure 2: Frequency and percentage distribution of post-intervention knowledge scores of study subjects.**



Maximum number of the study subjects i.e. 98% had adequate knowledge, 2% had moderate knowledge and none of the subjects had inadequate knowledge.

**2.3. Comparison between pre-interventional and post-interventional knowledge scores of study subjects regarding Self-administration of insulin.**

**Figure 3: Frequency and percentage distribution of pre-intervention and post-intervention knowledge scores of study subjects.**



In the pre-interventional knowledge score 58% of subjects had inadequate knowledge while as in the post-interventional knowledge score none of the subjects had inadequate knowledge. Consequently, 40% of subjects in the pre- interventional knowledge score had moderate knowledge and in the post- interventional knowledge score 2% of the subjects had moderate knowledge, 6% of patients had adequate knowledge in the pre- interventional knowledge score and in the post- interventional knowledge score 98% had adequate knowledge.

Pre-& Post-interventional Knowledge score	Mean ± SD	Mean Difference	Paired T-Test	P value
Pre-interventional knowledge score	15.74±4.23	12.220	26.259	0.001*
Post-interventional knowledge score	27.96±1.87			

Table 2: Comparison of Mean, Standard deviation, paired “t” test between pre- and post- intervention knowledge scores regarding self-administration of insulin.

N=50

\*=significant

2.4. Association between Pre-interventional knowledge scores of study subjects regarding self-administration of insulin with demographic/clinical variables.

Table 3: Association between pre-interventional knowledge score and demographic/clinical variables N=50

Variables	Category	Inadequate Knowledge	Moderate Knowledge	Adequate Knowledge	Chi-square test	Table value	df	p-value
Age in years	< 20	3	2	0	13.731	18.307	10	0.186 NS
	20-29	2	4	0				
	30-39	3	5	2				
	40-49	7	4	0				
	50-59	10	2	0				



	> 59	2	3	1				
Gender	Male	3	9	2	8.912	5.991	2	0.012*
	Female	24	11	1				
Educational qualification	Illiterate	9	0	0	25.264	18.307	10	0.005*
	Middle	3	8	0				
	Secondary	8	2	0				
	Higher secondary	3	4	0				
	Graduation	3	5	2				
post-Graduate	1	1	1					
Occupation	Health related	0	3	3	25.852	5.991	2	0.000*
	Non-health related	27	17	0				
Time duration of insulin therapy	< 1years	13	12	3	14.566	9.488	4	0.006*
	1-5 years	14	3	0				
	>5 years	0	5	0				

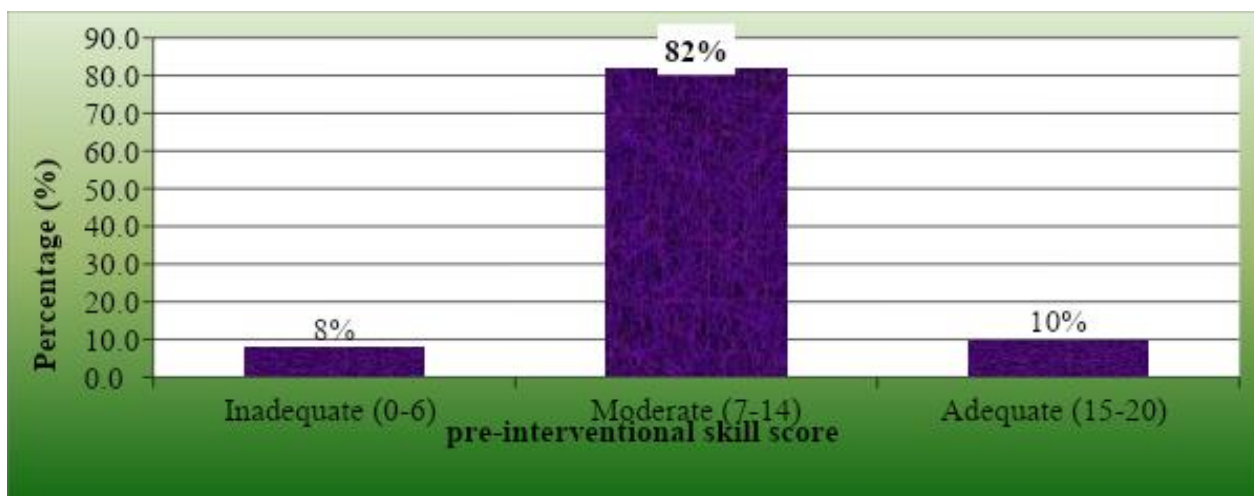
\*=Significant ( $p \leq 0.05$ ) NS= Non-significant ( $p > 0.05$ )

There was a significant association between the pre-interventional knowledge score and demographic/clinical variables (Gender ( $p=0.012$ ), Educational Qualification ( $p=0.005$ ), Occupation (0.001), Time duration of insulin therapy (0.006)) while as no significant association was found with other demographic variable (age ( $p=0.186$ )).

### Section 3: Skill scores regarding self-administration of insulin.

3.1 Pre-interventional skill scores of study subjects regarding self-administration of insulin.

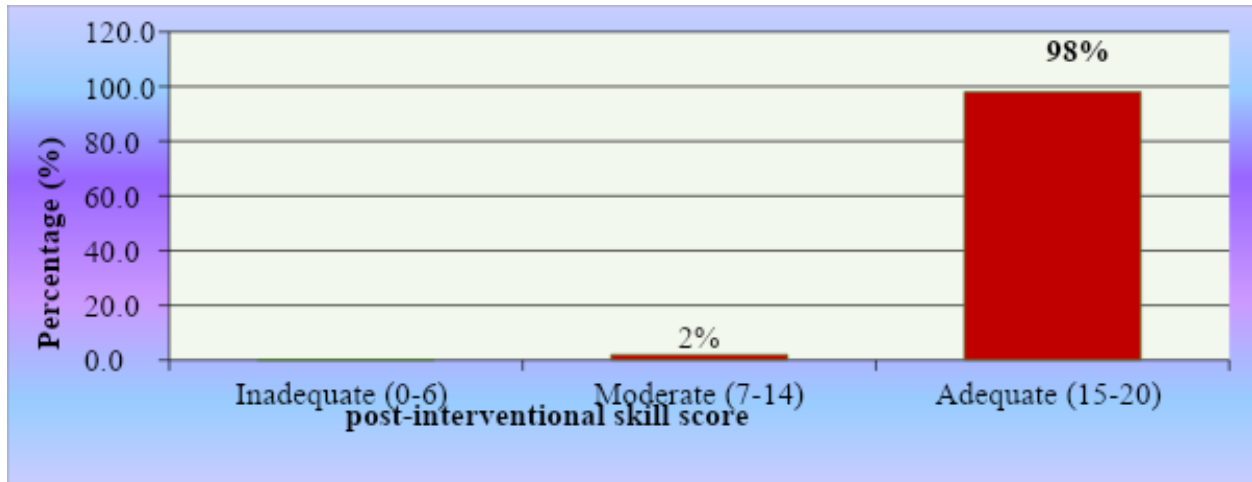
Figure 4: Distribution of pre-interventional skill score regarding Self-administration of insulin.



In the pre-interventional skill score, maximum number of the study subjects i.e. 82% had moderate skill, while as 10% had adequate skill and 8% subjects had inadequate skill.

3.2: Description of Post-interventional skill score of study subjects regarding self-administration of insulin.

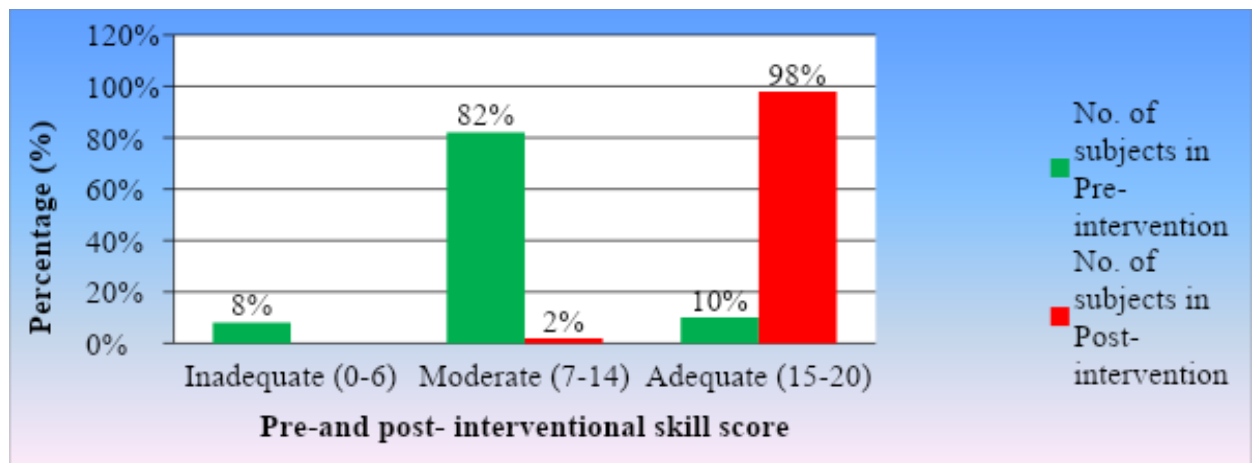
Figure 5: Frequency and percentage distribution of post-interventional skill scores study subjects.



In the post-interventional skill scores, maximum number of the study subjects i.e. 98% had adequate skill, 2% had moderate skill, while as none of the subject had inadequate skill.

3.3 Comparison between pre-interventional and post-interventional skill scores regarding self-administration of insulin among Diabetes Mellitus patients.

Figure 6: Frequency and percentage distribution of the pre-and post-interventional skill scores.



In the pre-interventional skill score, 8% of subjects had inadequate skill while as in the post-interventional skill score none of the subjects had inadequate skill. Consequently, 82% of subjects in the pre-intervention had moderate skill and in the post-intervention 2% of the subjects had moderate skill, 10% of subjects had adequate skill in the pre-intervention and in the post-intervention 98% had adequate skill.

Table 4: Comparison between Mean, Standard deviation, paired “t” test pre-and post-interventional skill scores regarding self-administration of insulin among diabetes mellitus patients.  
N=50



Pre- & Post-interventional skill score	Mean $\pm$ S.D.	Mean Difference	t value	P value
Pre-interventional skill score	10.16 $\pm$ 3.177	8.200	2.01	0.001*
Post-interventional skill score	18.36 $\pm$ 1.174			

\*=significant

**3.4 Association between pre-interventional skill score regarding self-administration of insulin among diabetes mellitus patients with demographic/clinical variable (age, gender, educational qualification, occupation and time duration of insulin therapy.**

**Table 5: Association between Pre-interventional skill score and demographic/clinical variables**

Variables	Category	Inadequate	Moderate	Adequate	Chi square Test	Table Value	df	P Value
Age	< 20	2	3	0	14.120	18.307	10	0.168 NS
	20-29	0	4	2				
	30-39	0	10	0				
	40-49	1	9	1				
	50-59	1	10	1				
	> 59	0	5	1				
Gender	Male	1	11	2	0.403	5.991	2	0.818 NS
	Female	3	30	3				
Educational Qualification	Illiterate	1	8	0	10.113	18.307	10	0.431 NS
	Middle	2	9	0				
	Secondary	1	7	2				
	Higher secondary	0	7	0				
	Graduate	0	8	2				
	post-Graduate	0	2	1				
Occupation	Health related	0	5	1	0.850	5.991	2	0.654 NS
	Non-health related	4	36	4				
Time duration of Insulin Therapy	< 1years	3	22	3	1.679	9.488	4	0.795 NS
	1-5 years	1	15	1				
	>5 years	0	4	1				

NS=Not significant (p>0.05)

There was no association found between pre-interventional skill scores and demographic/clinical variables such as age (p=0.18), gender (p=0.818), educational qualification (p=0.431), occupation (p=0.654), and time duration of insulin therapy (p=0.795).

**DISCUSSION**

Study shows that the pre-interventional knowledge and skill score (Mean  $\pm$  SD) of the study subjects were (15.74 $\pm$ 4.232) and (10.16 $\pm$ 3.177) respectively. In the pre-intervention, most of the subjects 54% had inadequate knowledge, 40% had moderate knowledge, 6% had adequate knowledge score and 82% had moderate skill, 10% had adequate skill, 8% had inadequate skill score. The post-intervention (Mean  $\pm$  SD) knowledge and skill score were (27.96  $\pm$  1.873) and (18.36 $\pm$ 1.174) respectively. The post-interventional knowledge and skill scores revealed that majority of the study subjects 98% had adequate knowledge and skill, 2% had moderate knowledge and skill, while as none of the subjects had inadequate knowledge and skill. These findings revealed subjects had developed adequate knowledge and skill in the post-intervention regarding self-administration of insulin. The result also revealed that there was significant association between the pre-interventional knowledge score and demographic variables (Gender ( $p=0.012$ ), Educational Qualification ( $p=0.005$ ), Occupation (0.000), Time duration of insulin therapy (0.006)). Whereas no significant association between the pre-interventional knowledge score and other demographic variable (age ( $p=0.186$ )). The results also revealed that there was no significant association between the pre-interventional skill scores and demographic/clinical variables such as age, gender, educational qualification, occupation, and time duration of insulin therapy. The findings are supported by the study conducted by **Swapna M K<sup>8</sup>-2016 (n=60)** to assess the effectiveness of structured teaching Programme on knowledge and skills regarding the Insulin Self Administration (ISA) among the Diabetes Mellitus Patients in Selected hospital of Delhi.<sup>7</sup>

## CONCLUSION

The findings of the study concluded that the diabetes mellitus patients lack adequate knowledge and skill regarding self-administration of insulin and there is a need for educating the patients. The mean knowledge and skill scores improved after implementation of the structured teaching program indicating that the structured teaching program was effective in increasing the knowledge and skill scores of Diabetes Mellitus Patients regarding self-administration of insulin. Therefore, awareness programs about self-administration of insulin among diabetes mellitus patients should be conducted.

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