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Effectiveness of Structured Teaching Programme on Self-administration of Insulin in terms of Knowledge and Skill of patients with Diabetes Mellitus

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Abstract
The current study aimed to evaluate the effectiveness of structured teaching programme on self-administration of insulin in terms of knowledge and skill of patients with diabetes mellitus. To assess and compare knowledge and skill regarding self-administration of insulin among diabetes mellitus patients before and after administration of structured teaching programme. To determine the relationship between knowledge and skill regarding self-administration of insulin among diabetes mellitus patients. To determine the association of knowledge and skill with selected variables. A quantitative research approach using quasi experimental research design (one group pretest–posttest) was adapted for the study. A study was carried out with 35 diabetes patients on insulin therapy at MMIMSR & Hospital, Mullana, Ambala. Demographic Performa, Structured knowledge questionnaire and Observation checklist were used to collect the data. The study observed that the mean posttest knowledge score (25.83) was significantly higher than the mean pretest score (16.09). The mean posttest skill score (25.28) was significantly higher than the mean pretest skill score (9.17).There was a weak positive statistical relationship(r=0.33, p>0.05) between knowledge with skill. The knowledge and skill of diabetes mellitus patients regarding self-administration of insulin was partially significantly (p≤0.05) associated with age (0.043) and (0.038).Therefore, it is concluded that structured teaching programme was effective in enhancing both the knowledge and skills in self-administration of insulin.

Keywords: Effectiveness, Structured teaching programme on self-administration of insulin, Knowledge, skills, Diabetes mellitus patients.

1. Introduction

Diabetes Mellitus is a chronic metabolic disease. In 2011, globally, the prevalence of diabetes is predicted from 366 million people and estimated to reach 552 million people to by 2030 [1]. India is considered as the diabetic capital of the world whose more than 62 million diabetic individuals currently diagnosed with the disease and considered as it is estimated that every fifth person with diabetes will be an Indian. An estimate shows that nearly 1 million Indians die due to Diabetes every year (International Diabetes Foundation India) [2].The treatment for diabetes mellitus includes administration of Oral hypoglycemic agents, insulin therapy and lifestyle modification. However, control of diabetes with diet, weight control and physical activity has been difficult and will not be sufficient for most of the patients[3].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. There is no definite insulin dose that works well for every individual; the dosage of insulin is based on patient's blood level and the types of insulin used [4]. 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 so as to ensure timely administration of insulin [5]. The diabetes patients who are on insulin need to be knowledgeable regarding the disease and also they must have a competency towards self-administration of insulin injection to overcome the barriers of insulin injection and to have a good glycaemia control [6].

Therefore, the study was conducted to evaluate the effectiveness of structured teaching programme on self-administration of insulin in terms of knowledge and skill of patients with

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diabetes mellitus admitted at MMIMS&R Hospital, Mullana, Ambala.

2. Methodology
A quantitative approach with quasi (one group pretest - posttest design) was adapted. The study was conducted on Medicine and Surgical wards of MMIMS&R Hospital, Mullana, Ambala. 35 diabetes mellitus patients on insulin therapy were selected by using purposive sampling techniques.The data were collected using demographic Performa, Structured knowledge questionnaire and observational checklist on self-administration of insulin on day as pretest and structured teaching programme was given on self-administration of insulin by one by one teaching (lecture cum demonstration). The patient was asked to re demonstrate for next doses. Posttest of skill was done for those patients who have achieved 75% skills and posttest of knowledge was taken on same day. The information of knowledge was collected by interview techniques and skill was done by observational checklist.

Demographic Performa consisting of 13 items: age, gender, religion, marital status, educational status, occupation, total monthly income, type of diabetes mellitus, duration of diabetes mellitus, duration of insulin therapy ,frequency of insulin injection per day, device used for insulin injection, any co morbid disease with diabetes mellitus. Structured knowledge questionnaire regarding self-administration of insulin consisting of 36 items covering the following 3 areas: Knowledge regarding concepts of insulin administration, techniques of self-administration of insulin, complications and precaution of insulin administration. Observational checklist was prepared for evaluating the skills in performing the self-administration of insulin. There were total 30 items in the checklist covering the following 3 areas: pre procedure, procedure and post procedure. Content validity of the tools was established by the suggestion of expert in the field. Internal consistency of the questionnaire was computed by using kuder Richardson and found to be reliable.(0.64).Inter rater reliability of observational checklist on self-administration (r=0.72).The training on self-administration of insulin was prepared by reviewing the literature, seeking the opinion of the experts and validated by expert. Ethical consideration: Formal administrative approval was obtained from the Medical Superintendent and Head of Department of Medicine and Surgical ward of MMIMS&R Hospital, Mullana, Ambala. Informed written Consent was taken from the participants.

3. Results
The mean posttest knowledge score (25.83) is significantly higher than the mean pretest knowledge score (16.09) and the mean posttest skill score (25.28) is significantly higher than the mean pretest skill score (9.17).

Table 1: Mean, mean difference, standard deviation and t value of pretest and posttest knowledge score and F value of pretest and posttest skill score of the diabetes mellitus patient regarding self-administration of insulin.

Test	Mean	Mean $_D$	SD$_D$	t value	P value
Pre test	16.09	9.74	3.92	14.6	0.001
Post test	25.83				

Test	Mean	Mean $_D$	F	df$_1$/df$_2$	P
Pre-test skill	9.17	11.8	748	2.54/86.57	0.001
Post-test skill	25.28				

Table 1 shows that the computed paired t and F value is significant for both (t=14.6, p=0.001)knowledge and skill (F=748,df 2.54/86.57.p=0.001) is significant. This statistical analysis shows that the gain in knowledge and skill were not by chance and thus improved by structured teaching programme.

Findings related to relationship between Knowledge and Skills among Diabetes Mellitus Patient regarding Self Administration of Insulin

The indicates co-efficient of co-relation between posttest knowledge and 1st,2nd,3rd and 4thpost test skill scores. Pearson's r was computed to find out the relationship between knowledge and skill sores Calculated 'r' value was (r=-0.198, 0.197,0.235 and 0.194)suggesting no significant correlation between posttest knowledge score and posttest skills scores as obtained 'r' value was lower than the table value(0.33) at 0.05 level of significance.

Findings related to the association of mean posttest knowledge score and posttest skills score with selected variables of diabetes mellitus patients regarding self-administration of insulin.

The knowledge (p=0.043) and skills (p=0.038) of diabetes mellitus patients regarding self-administration of insulin was significantly partially associated with age at the level of (p≤0.05).

4. Discussion
The results of the present study reveals that the mean posttest knowledge score (25.83) and skills (25.28) regarding self-administration of insulin was significantly higher than the mean pretest knowledge score (16.09) and skill (9.17) after administration of Structured teaching programme. Similar findings were reported by Swetha Shettigar, Ashwini Kamath *etal.* (2013) who evaluated to assess the training on improving the competency level of self-administration of insulin among type 2 diabetes patients that the mean posttest mean knowledge score (25.8) and skills scores (31.7) was significantly higher than that of the pre-test mean knowledge score (13.8) and skills score (20.3) which improved after providing training programme[7].The present study revealed that there is a weak positive correlation between knowledge and skills regarding self-administration of insulin (r = 0.33,p>0.05).Similar a study conducted by Swetha Shettigar, Ashwini Kamath *et al.*(2013) also showed a weak positive correlation between knowledge and skills(r=0.4, p>0.05) [7] A study conducted by Valentine U Odili *etal.* (2011)[8] and Uniyime Sunday, Macmillian *etal.* (2014)[10]regarding the knowledge of insulin use and its determinants among insulin requiring diabetes patients, which reveals that there was no statistically significant association in knowledge with age (p> 0.05). But, the present study reveals that there was a significant association in knowledge scores with age (P=0.043) at the level of p≤0.05. A study reported by A Surendranath, B Nagarajuetal (2012) showed that there was a significant association between the practice on insulin self administration with age at the level of p<0.05[10].And this result was consistent with the present study that there was a significant association between the skill and self-administration of insulin with age (P=0.038) at the level of

p≤0.005. A study reported by Swetha Thungathurthi, SmithaThungathurthi *etal.* (2012) who conducted to assess the self-care knowledge on diabetes patients. Which showed that 46.49% patients didn't knew the proper site for administering the insulin injection, 60.8% of patient didn't knew the storage conditions for insulin [11]. In present study, around 28.6% of patients didn't knew the correct site for administering the insulin injection 17.2% of patient didn't knew the storage conditions for insulin.

5. Conclusion
The study concluded that the diabetes mellitus patients had good knowledge and very good skill regarding self-administration of insulin and improved after structured teaching programme. The study findings reveals that there is no significant correlation between knowledge and skill and there is partially associated of knowledge (p=0.043) and skill (p=.0.038) with age at the level of (p≤0.05).

6. Recommendations
The study can be replicated on a larger sample of diabetes mellitus patients in different setting for making broad generalization. A true experimental study can be conducted with structured teaching programme regarding self-Administration of Insulin. A descriptive study can be carried out to identify the barriers of self-administration of insulin among diabetes mellitus patients. A study can be conducted to assess other variables like attitude, beliefs and adherence regarding insulin therapy among diabetes mellitus patients.

7. Acknowledgement

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