



International Journal of Advance Research in Community Health Nursing

E-ISSN: 2664-1666
P-ISSN: 2664-1658
www.communitynursing.net
IJARCHN 2019; 1(2): 28-37
Received: 19-05-2019
Accepted: 23-06-2019

Roohi Jan

Tutor (MSc Community Health Nursing), Syed Mantaqi Memorial College of Nursing and Medical Technology, IUST Awantipora, Jammu & Kashmir, India

Mehmooda Regu

Professor, Madre Meharban Institute of Nursing Sciences and Research, SKIMS Soura, Srinagar, Jammu & Kashmir, India

Corresponding Author:

Roohi Jan

Tutor (MSc Community Health Nursing), Syed Mantaqi Memorial College of Nursing and Medical Technology, IUST Awantipora, Jammu & Kashmir, India

Effectiveness of structured teaching program on self-care of patients with diabetes mellitus

Roohi Jan and Mehmooda Regu

Abstract

Background: Diabetes is a chronic public health problem, and is growing as an epidemic in both developed and developing countries. Diabetes currently affects more than 62 million Indians, which is more than 7.1% of the adult population. Indian Heart Association reported India is projected to be home to 109 million individuals with diabetes by 2035.

Objectives: The main objective of the study was to evaluate the effectiveness of a STP on self-care of patients with diabetes mellitus and associate the pre-test knowledge scores with selected demographic variables.

Methods: Pre-experimental one group pre-test post-test design was used for the study, by Purposive Sampling technique & Sample size was 60 patients with diabetes mellitus admitted in endocrinology ward of SKIMS, Soura Srinagar. Patients who were willing to participate in the study, available at the time of data collection & above 30 years of age were included in study. An informed consent was obtained from the subjects; the structured interview schedule was administered after giving necessary instruction to the individual subjects at the bedside. On the same day STP was administered. On the 7th day post-test was taken to the subjects by using the same tool.

Results: The majority of the patients 55 (91.7%) had inadequate knowledge regarding self-care of diabetes mellitus before the STP. After the implementation of STP, 43(71.67%) had acquired adequate knowledge. The mean post-test knowledge score obtained by the patients was improved to 80.04% from a mean pre-test knowledge score of 31.06%, which was significant at P-value of 0.05 level which showed significant increase in knowledge. The association between pre-test knowledge score and demographic variables -sex, education, and occupation (0.037, 0.029 and 0.010 respectively and was significant at 0.05 levels).

Interpretation and Conclusion: The study showed that there was a significant improvement in the knowledge scores after the administration of STP. Hence it was concluded that the STP was effective in improving the knowledge of patients regarding self-care of diabetes mellitus.

Keywords: Structured teaching programme, self-care, and diabetes mellitus

1. Introduction

Diabetes mellitus is a group of metabolic disorders arising either due to relative or absolute deficiency of a digestive hormone called insulin or inability or resistance of body cells to use the available insulin. Diabetes mellitus is a silent disease and is now recognized as one of the fastest growing threats to public health in almost all countries of the world. Every 5th person who suffers from diabetes in the world today is an Indian¹. India has now been declared by WHO as the diabetes capital of world.

Diabetes is now growing as an epidemic in both developed and developing countries. India leads the world today with the largest number of diabetes in any given country followed by China and USA^[2]. Every day, every 21st seconds someone is diagnosed with diabetes.

Although diabetes cannot be cured, the disease can be managed by non-pharmacological and pharmacological strategies, where improvements in glycaemic control is important factor in delaying the onset and progression of diabetes-related complications^[3].

The patient's own role in diabetes treatment and recognition of the need to educate patients in Diabetes self-management has long been considered to be important. The concern about educating patients to take care of their diabetes began more than 100 years ago and was emphasized with the publication of the Diabetic Manual for the Doctor and Patient by Elliot Proctor Joslin in 1918^[4]. Since then several guidelines for diabetes care including education have been developed, among these are The World Health Organization's guideline for a national program for diabetes mellitus⁵, which stressed the importance of developing

effective patient education programs to maintain the health and quality of life of individuals with diabetes.

Diabetes self-management intervention has emerged as a resource to assist patients in managing daily diabetes care through dissemination of information and facilitation of self management behaviours^[6]. In the development of education intervention there has therefore been an interest in identifying approaches that could strengthen the individuals' beliefs in their own competency to handle their diabetes, and hopefully thus enabling them to control the disease⁷. This indicates a need for health professionals to focus on the patients, their lives and their health problems, rather than on the disease and disease management in diabetes treatment. The individual's ability to conduct self-care activities and to assume responsibility for daily diabetes care are supposed to be reflected in good outcomes, which make the patients less prone to diabetes-related complications.

1.1 Need for the study

Diabetes is an "ice berg" disease. According to recent estimates the prevalence of diabetes mellitus in adults was around 4% worldwide. This means that over 143million persons were affected. It is projected that the disease prevalence will be 5.4% by the year of 2025 with the global diabetic population reaching 300 millions, whereas in the developing world the majority of diabetes is aged 65 years and above. By 2030 as much as 9% of the population would be diabetic^[8].

Diabetes can affect nearly every organ in the body. People with diabetes are 2 times more likely to develop blindness, 17 times more likely to develop kidney disease, 30-40 times more likely to undergo amputation, 2-4 times more likely to suffer a stroke than non diabetics, Women with diabetes are at 7 times more likely to have heart disease. Heart disease is more diffused in diabetics who are also more prone to silent attacks as they experience no pain associated with an attack because of diabetic neuropathy. This possible complications make diabetes dreaded disease^[2].

One of the primary objectives on the care of diabetic patients is to educate the patients regarding self-care. The overall goal of care is to control or regulate the disease rather than cure. The patient who is not knowledgeable about the disease condition and treatment cannot practice instruction given to prevent further complications. In order to carry out these functions patient must be thoroughly instructed in the care of diabetes mellitus, their knowledge and practice should be checked periodically^[8].

The American Diabetes Association recommends assessment of self management skills & knowledge of diabetes at least annually and the provision of encouragement of continuing diabetic education^[9].

A study conducted in US states that diabetes is a chronic and serious disease which cannot be neglected and self management activities will control their diabetes and reduce the likelihood of long term complications. If self management is to be effective, diabetic patients must have knowledge and be motivated to look after themselves and take appropriate action when complications are present. A great deal depends on patient education^[10].

A cross sectional survey was conducted in resettlement colony of Chandigarh about knowledge and practice regarding diet, genital hygiene, care of foot, wound, prevention of complications and medication. This study revealed that there is a need to reorient and motivate health

personnel in educating diabetics regarding self-care^[11].

A cross sectional study was conducted in Iran University of medical sciences to determine the knowledge and practice of foot care in people with type II diabetes. A knowledge questionnaire was administered to 148 patients with type II diabetes and their knowledge score was calculated which revealed that their knowledge score of foot care was 6.6 (SD t/3.0) which was considered as moderate knowledge. The study findings showed inadequate knowledge on foot care and the necessity to teach the patients regarding foot care^[11].

The evidences from the literature show that the management of diabetes among diabetes mellitus patients is poor due to lack of knowledge. At the same time on further assessment it was found that due to carelessness and lack of knowledge the diabetes mellitus patients neglect to take care of themselves; as a result succumb to various complications. From various literature reviews it is clear that a Structured Teaching Programme would help to impart knowledge to patients regarding foot care, exercises, diet, and prevention of complications.

During the clinical experience the investigators have noticed that majority of diabetes patients do not take prescribed medicine, neglecting the dos & do not's of the diet & do not know the importance of exercise & foot care which leads to complications. The investigators have observed that a number of diabetic patients are hospitalized because of uncontrolled hyperglycaemia, ulcers on foot, diabetic nephropathy, neuropathy & hypertension.

All these factors motivated the investigators to conduct a study on the effectiveness of a Structured Teaching Programme on self-care of patients with diabetes mellitus.

1.2 Objectives of the study

- I. To assess the existing level of knowledge regarding self-care among the patients with diabetes mellitus by pre-test.
- II. To evaluate the effectiveness of a structured teaching programme on self-care of patients with diabetes mellitus by post-test.
- III. To associate the pre-test knowledge scores with selected demographic variables.

2. Research methodology

2.1 Approach

In order to accomplish the main objective of assessing the effectiveness of structured teaching programme on self-care of patients with diabetes mellitus, a quantitative approach was adopted.

2.2 Design

Pre-experimental one group pre-test post-test design was adopted for this study. The pre-test was carried out for assessing the knowledge of patients on self-care of diabetes mellitus by structured interview schedule and individual structured teaching programme was administered on the same day. Post-test was conducted on the 7th day following the pre-test. The design did not include any control group.

2.3 Variables

Dependent variable: Patient's self-care knowledge regarding diabetes mellitus.

Independent variable: Structured Teaching Programme.

Demographic variables: Age, sex, education, occupation,

income, residence, duration of illness and marital status.

2.4 Setting

The study was conducted at endocrinology ward of Sher-I-Kashmir Institute of Medical Sciences Srinagar, Jammu and Kashmir India. It is a well equipped, tertiary care Institute and is well known for its treatment and nursing care. It is an educational institution cum research centre. Management and staff are very much concerned with the quality care of patients. Patient care is supervised by the ward in-charges as well as supervisors. An average of 100 Diabetic patients is admitted in endocrinology ward of SKIMS per month. Total Patient care is carried out by the nurses and the care givers of patients are also included in the patient care.

2.5 Population

In this study population consisted of patients with diabetes mellitus, who were admitted in the endocrinology ward of Sher-I-Kashmir Institute of Medical Sciences Srinagar, during the time of data collection.

2.6 Sample and Sampling Technique

In this study the sample consisted of 60 patients with diabetes mellitus admitted in the endocrinology ward of Sher-I-Kashmir Institute of Medical Sciences Srinagar. Purposive sampling technique was used to select the sample.

2.6.1 Sampling criteria

Inclusion criteria: Patients who were

- I. Willing to participate in the study
- II. Available at the time of data collection.
- III. Above 30 years of age.
- IV. Able to understand & respond.

2.7 Tools and techniques

2.7.1 Tool

A structured interview schedule was selected for the study to assess the knowledge of patients with diabetes regarding self-care. It was considered as the most appropriate tool to elicit response from the patients.

The interview schedule consisted of three sections:-

Section A: Comprises of Demographic profile with 8 items, viz. Age, sex, education, occupation, income, residence, duration of illness and marital status.

Section B: Comprises of Clinical information of patient with Diabetes Mellitus with 7 items like weight, height, body mass index, family history of diabetes, associated health problems, on insulin therapy and who is injecting insulin to the patient with diabetes mellitus.

Section C: Comprises of 48 items related to knowledge on self-care of patients with diabetes mellitus. One score was allotted to each correct answer and zero for wrong response. The items were categorized under the following eight components; General information, Diet, Exercise, Medication/insulin administration, Self monitoring of blood glucose, Foot care, Follow up and Prevention of complications.

The maximum score was 48. To interpret level of knowledge the scores were distributed as follows;

- Inadequate knowledge $\leq 50\%$
- Moderately adequate knowledge 51 – 75 %

- Adequate knowledge $> 75\%$

2.7.2 Structured teaching programme

A Structured Teaching Programme was prepared with the following areas:

- Diabetes mellitus- meaning, definition, pathophysiology, pre-disposing factors, signs and symptoms.
- Diet- Its importance, menu, and guidelines for eating
- Exercise- Common exercises points to be remembered while doing exercise and importance of exercise.
- Medication/insulin administration- Insulin therapy, sites for insulin therapy, instructions to be remembered, side effects of insulin, management of hypoglycaemia.
- Self monitoring of blood glucose- Importance, procedure and precautions to be taken while monitoring blood sugar level.
- Foot care- daily care of foot and use of footwear.
- Follow up- Regular follow up and its importance and purposes.
- Prevention of complications- Make a commitment to managing your diabetes, don't smoke, Keep your blood pressure and cholesterol under control, Schedule yearly physicals and regular eye exams, Take care of your teeth and take stress seriously.

2.8 Ethical consideration

The researchers had taken permission from the Ethical committee and endocrinology department of Sher-I-Kashmir Institute of Medical Sciences, Srinagar to conduct the research study. Permission was obtained from the Head of Department of endocrinology ward Sher-I-Kashmir Institute of Medical Sciences Srinagar, Kashmir. Consent was taken from the subjects before data collection. The subjects were informed that the confidentiality of data will be maintained.

2.9 Data collection

Prior to data collection, the investigators familiarised themselves with the subjects and explained to them the purpose of the study. They requested the participant's full co-operation and assured them the confidentiality of their response. An informed consent was obtained from the subjects. Each subject was then made to sit on the bedside chair comfortably. The investigators sat opposite facing the subject. Once the subject was at ease and comfortable, the structured interview schedule was administered after giving necessary instruction to the individual subjects at the bedside.

The time taken for pre-test was 25-30 minutes. On the same day structured teaching programme was administered by using flip book, and it took 45-50 minutes. On the 7th day post-test was taken to the subjects by using the same tool. The average time taken was 20 minutes. The investigator collected data from 1-3 subjects per day. The data was compiled for data analysis.

The investigators expressed gratitude to all patients for their participation and motivated them to control their blood sugar level within normal limits and to practice self-care.

2.10 Data analysis

The data was planned to be entered in master sheet. Based on the objectives data analysis was planned to be done, by using descriptive and inferential statistics such as mean, frequency, percentage and standard deviation. The findings

were planned to be presented in the form of tables and figures. Effectiveness of Structured teaching programme was planned to be analysed by using Paired 't' test. Association between pre-test mean self-care knowledge score and selected demographic variables was planned to be analysed by using ANOVA.

3. Results

3.1 Demographic profile of patients with diabetes mellitus

- Majority of the patients i.e. 19 (31.7%) were in the age group of 51-60 yrs and 17 (28.3%) were in the age group of 30-40 yrs, 13 (21.7%) were in the age group of 41-50 yrs and only 11(18.3%) were to the age above 60 years.
- 39 (65.0%) were female patients and 21 (35%) were male patients.
- Majority of patients 36 (60%) were illiterates, 16 (26.7%) had education up to 12th standard and only 8 (13.3%) patients had education above 12th standard.
- 49 (81.7%) of participants were self employed and only 11(18.3%) were employed.
- 2(3.3%) patients were having income less than Rs 5000, 16(26.7%) patients were having income in range of Rs 5001-10,000, 20 (33.3%) patients were in range of 10,001-15000 Rs/month and majority of patients, 22(36.7%) were having income of more than 15001Rs/month.
- 40 (66.7%) patients were from rural areas and only 20 (33.3%) patients were from urban area.
- 16 (26.7%) of the patients were having the disease from less than 2 years, 9 (15%) diabetic patients were having duration of illness in the range of 3-5 years, 15(25%) were having duration of illness in the range of 6-8 years and majority of patients 20(33.3%) were having diabetes from more than 9 years.
- Majority of Diabetic patients 53(88.3%) were married and only 7 (11.7%) patients with diabetes mellitus were unmarried.

3.2 Clinical information of the patients with diabetes mellitus.

- The range of body weight among 60 participants was 40-54kgs in 3(5%), 55-69kgs in 29(48.33%), 70-84kgs in 23(38.34%) and 85-99kgs in 5(8.33%) of the patients respectively.
- It was revealed that the range of height of the patients

was 162-167cms in 23(38.33%), 168-173cms in 18(30%), 156-161cms in 15(25%) and 150-155cms in 4(6.67%) patients respectively.

- Only 1(1.67%) patient was underweight, 26(43.33%) patients were having normal weight, 23(38.33%) patients were overweight/Pre-obese, 9(15%) patients were having class I obesity, 1(1.67%) was with class II obesity and none of the patients were having class III obesity(WHO Classification of Obesity).
- The mean, median, range and standard deviation of Weight was 69.5, 68.5, 52 and 11.44, that of height was 163.78, 164, 22, 5.459 and that of Body Mass Index was 25.88, 25.5, 18 and 4.267 respectively.
- 25(41.7%) of the patients had family history of diabetes mellitus and 35(58.3%) patients did not have the family history of diabetes mellitus.
- 29 (48.3%) patients were having hypertension, 22 (36.7%) patients did not have any other health problem and 9 (15%) patients with diabetes mellitus were also having other problems like hypothyroidism, chest infection, etc.
- All the patients with diabetes mellitus 60 (100%) were on insulin injection.
- 33(55%) patients were administering the insulin by themselves, 23 (38.3%) patients with diabetes mellitus were being injected insulin by their family members and only 4(6.7%) were being injected insulin by others(Nursing & Paramedical Staff).

3.3 Knowledge related to self-care of diabetes by pre-test and post-test score

- The pre-test was conducted by administering a structured interview schedule. In which majority of patients 55(91.67%) of them had inadequate knowledge, 5(8.33%) of them had moderate knowledge and none of the patients (0%) had adequate knowledge. The data in Table 1 clearly indicates the need for a structured teaching programme on imparting the knowledge to the patients. The post-test was administered after the structured teaching programme. The post-test knowledge scores shows a significant difference i.e., none of them were having inadequate knowledge, 17(28.33%) were having moderate knowledge and majority of them 43(71.67%) had acquired adequate knowledge from the structured teaching programme on self-care of patients with diabetes mellitus.

Table 1: Distribution of patients according to pre-test and post-test knowledge scores.

Knowledge level	Pre test		Post-test	
	Frequency	Percent (%)	Frequency	Percent (%)
Inadequate knowledge ($\leq 50\%$)	55	91.67	0	0.00
Moderately adequate knowledge (51-75%)	5	8.33	17	28.33
Adequate knowledge ($\geq 75\%$)	0	0.00	43	71.67
Total	60	100	60	100

Data in Table 2 depicts that the patient's post-test knowledge score range (31-46) was higher than pre-test knowledge score range i.e., (5-28). The data also reveals that the mean post-test knowledge score i.e. (\bar{X} =38.62) was apparently higher than mean pre-test knowledge score (\bar{X} =16.82). The data also shows that median of pre-test and post-test -knowledge score was 17.00 and 38.00 respectively. The standard deviation of pre-test and post-test

knowledge score was 4.835 and 3.232 respectively.

Table 2: Mean, Median, Range and Standard Deviation of Pre-test and Post-test knowledge Score N=60

Knowledge Score	Mean	Median	Range (Min- Max)	Standard Deviation
Pre-test	16.82	17.00	23 (5-28)	4.835
Post-test	38.62	38.00	15 (31-46)	3.232

Table 3: Area wise Mean, Mean Percentage and Standard Deviation of Pre-test knowledge Score N=60

Sl. No.	Knowledge aspects	No. of Items	Max Score	Mean	Mean %	Standard Deviation
1.	General Information	5	5	2.20	44	0.97
2.	Diet	8	8	2.77	34.58	1.41
3.	Exercise	5	5	1.82	36.4	1.08
4.	Medication	10	10	3.62	36.2	1.61
5.	Self monitoring of Blood Glucose	5	5	1.58	31.6	0.96
6.	Foot care	4	4	1.17	29.25	0.87
7.	Follow up	2	2	0.67	33.5	0.57
8.	Prevention of Complications	9	9	2.98	33.11	1.47
	Overall	48	48	16.82	35.04	4.835

The above table 3 shows the mean, mean percentage and standard deviation of pre test knowledge scores in various aspects. It can be seen from the table that the mean, mean percentage and SD in the area of general information was 2.20, 44% and 0.97 respectively. The score in the area of diet was 2.77, 34.58% and 1.41, in the area of exercise was 1.82, 36.4% and 1.08, in the area of Medication was 3.62,

36.2% and 1.61, in the area of self monitoring of blood glucose 1.58, 31.6% and 0.96, in the area of foot care 1.17, 29.25% and 0.87, in the area of follow up 0.67, 33.5% and 0.57 and in the prevention of complications 2.98, 33.11% and 1.47. The overall mean, mean percentage and standard deviation was 16.82, 35.04% and 4.835.

Table 4: Area wise Mean, Mean Percentage and Standard Deviation of Post-test knowledge Score N=60

Sl. No.	Knowledge aspects	No. of Items	Max Score	Mean	Mean %	Standard Deviation
1.	General Information	5	5	4.55	91	0.65
2.	Diet	8	8	5.52	69	1.22
3.	Exercise	5	5	4.22	84.4	0.76
4.	Medication	10	10	7.80	78	0.15
5.	Self monitoring of Blood Glucose	5	5	4.02	80.04	0.72
6.	Foot care	4	4	3.62	90	0.58
7.	Follow up	2	2	1.50	75	0.53
8.	Prevention of Complications	9	9	7.40	82.22	0.96
	Overall	48	48	38.62	80.46	3.232

Data presented in Table- 4 shows mean, mean percentage and standard deviation of patient's post-test knowledge score in various aspects of self-care of patients with diabetes mellitus. It is depicted from the table that mean, mean percentage and standard deviation in the area of general information was 4.55, 91% and 0.65 respectively. The score in the area of diet was 5.52, 69% and 1.22, in the area of exercise 4.42, 84.4% and 0.76, in the area of Medication 7.80, 78% and 0.15, in the area of self monitoring of blood glucose 4.02, 80.04% and 0.72, in the area of foot care 3.62, 90% and 0.58, in the area of follow up 7.40, 75% and 0.53 and in the prevention of complications 7.40, 82.22% and 0.96. The overall mean, mean percentage and standard deviation was 38.62, 80.46% and 3.232 respectively.

3.4 Correlation of Area wise Pre-test Knowledge scores

Figure- 1 and Table 5 show the correlation of area wise pre-test knowledge scores along with the p – values done by Pearson correlation method. The data depicts that there was a significant correlation of general information regarding diabetes mellitus with exercise, medication, foot care and prevention of complications with p values 0.003, 0.025, 0.029, 0.016 respectively at a 0.05 level of significance. Likewise, there was significant correlation of exercise with foot care, follow up and prevention of complications with p

values 0.038, 0.004, 0.013 respectively at a 0.05 level of significance. Medication was significantly correlated with foot care and prevention of complications with p value 0.031 and 0.003 respectively. Foot care with prevention of complications with p value 0.01. Follow up with prevention of complications with p value 0.05 at a 0.05 level of significance.

There was not significant correlation of general information with diet, self monitoring of blood glucose and follow up with p value 0.354, 0.679, 0.244 respectively at a 0.05 level of significance depicted by Pearson correlation method. Likewise there was not significant correlation of diet with exercise, medication, self monitoring of blood glucose, foot care, follow up and prevention of complications with p values 0.475, 0.663, 0.557, 0.860, 0.066, 0.675 respectively. Exercise did not have significant correlation with medication and self monitoring of blood glucose having p value 0.087 and 0.584 respectively. Medication was not significantly correlated with self monitoring of blood glucose (p= 0.168) and follow up (p=0.962). Self monitoring of blood glucose was not significantly correlated with foot care (p= 0.424), follow up (0.273) and prevention of complications (p= 0.216). There was not significant correlation of foot care with follow up (p=0.34) at a 0.05 level of significance.

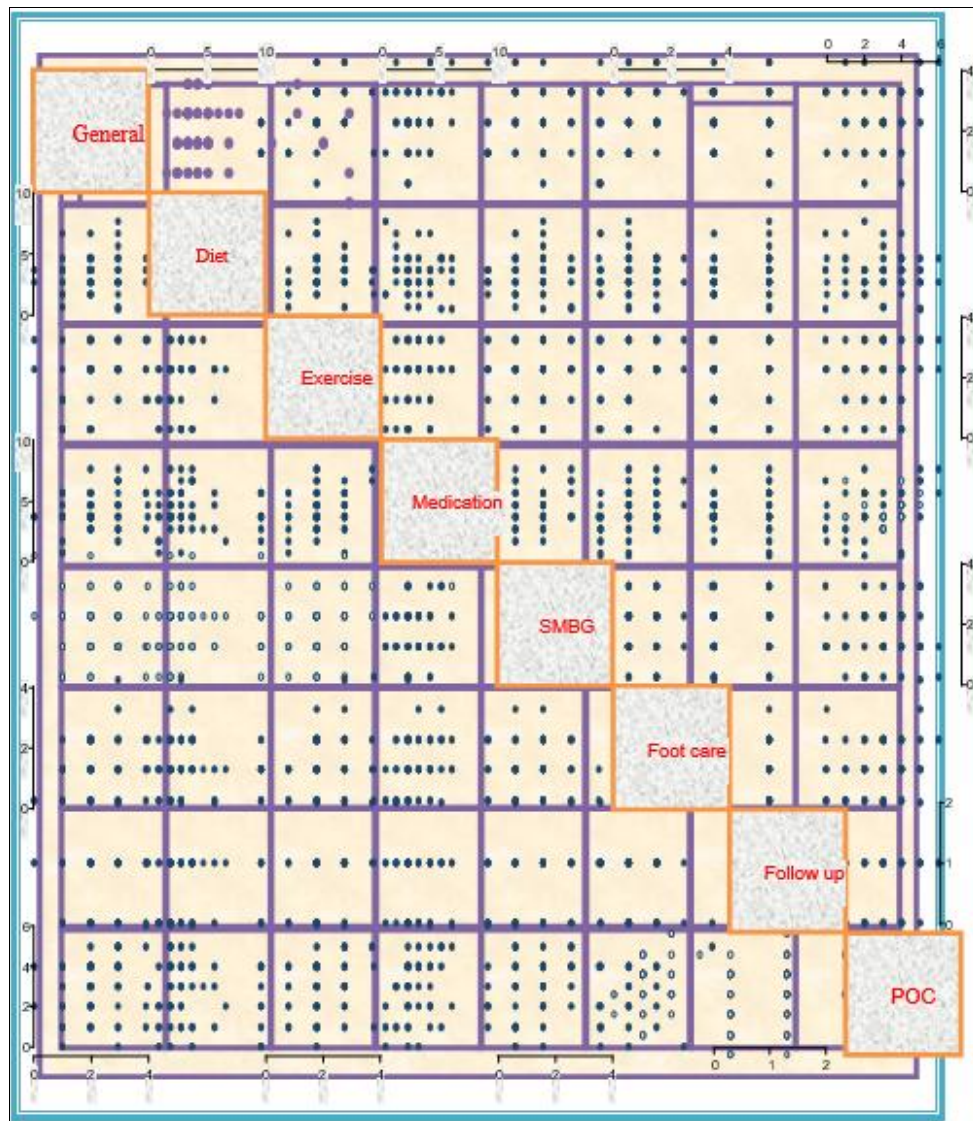


Fig 1: Scattered graph showing correlation of area wise pre-test knowledge scores

Table 5: Correlation of area wise pre-test knowledge scores

Area wise know ledge with p value	General Information	Diet	Exercise	Medication	SMBG	Foot care	Follow up	POC
General Information	1.00							
Diet	0.121 0.354**	1.00						
Exercise	0.374 0.003*	0.094 0.475**	1.00					
Medication	0.289 0.025*	0.057 0.663**	0.222 0.087**	1.00				
SMBG	0.054 0.679**	0.077 0.557**	0.072 0.584**	0.180 0.168**	1.00			
Foot care	0.282 0.029*	0.023 0.860**	0.2682 0.038*	0.2780 0.031*	0.105 0.424**	1.00		
Follow up	0.152 0.244**	0.238 0.066**	0.365 0.004*	0.006 0.962**	0.143 0.273**	0.12 0.34**	1.00	
POC	0.309 0.016*	0.055 0.675**	0.316 0.013*	0.375 0.003*	0.161 0.216**	0.30 0.01*	0.253 0.050*	1.00

Key: SMBG: Self Monitoring of Blood Glucose. POC: Prevention of complications. *: Significant at a 0.05 level of significance. **: Non-significant at a 0.05 level of significance.

3.5 Findings related to effectiveness of structured teaching programme

Paired t test was used in order to find out the significance of difference between the mean pre-test and post-test knowledge score on self-care in diabetes mellitus.

To test the statistical difference between pre-test and post-test knowledge score null hypothesis was framed.

Null hypothesis (H₀):- There is no difference between mean pre-test & post-test self-care knowledge scores of diabetic patients.

Table 6: Comparison of pre-test and post-test knowledge scores by using t-test. N= 60

Knowledge Score	Mean	Standard Deviation	Mean Difference	t value	p value	Inference
Pre-test	16.82	4.835	21.800	39.697	<0.001	Significant
Post-test	38.62	3.232				

The above table shows the comparison between the pre-test and post-test knowledge score of participants regarding self-care of diabetes mellitus. It is evident from the table that mean post-test knowledge score (38.62) was higher than the mean pre-test knowledge score (16.82) i.e. the mean difference was 21.80. The computed paired 't' test value ($t_{49} = 39.697$, $p < 0.001$) shows high significance (at the level $\alpha = 0.05$).

Hence the null hypothesis (H_0) related to no difference between pre-test and post-test overall mean scores was rejected and research hypothesis (H_1) was accepted i.e. there is significant difference between mean pre-test and post-test knowledge score on self-care of patients with diabetes. Therefore it can be interpreted that the structured teaching programme was effective in improving the knowledge of patients regarding self-care of diabetes.

Table 7: Area wise comparison of pre-test and post-test knowledge scores by using t-test. n=60

S. No	Knowledge Aspects	Pre-test		Post-test		Mean Difference	t value	p value	Inference
		Mean	S.D	Mean	S.D				
1.	General Information	2.20	0.97	4.55	0.65	2.35	20.69	<0.001	S
2.	Diet	2.77	1.41	5.52	1.22	2.75	10.85	<0.001	S
3.	Exercise	1.82	1.08	4.22	0.76	2.40	18.08	<0.001	S
4.	Medication	3.62	1.61	7.80	0.15	4.18	21.27	<0.001	S
5.	Self monitoring of Blood Glucose	1.58	0.96	4.02	0.72	2.43	19.94	<0.001	S
6.	Foot care	1.17	0.87	3.62	0.58	2.45	19.68	<0.001	S
7.	Follow up	0.67	0.57	1.50	0.53	0.83	8.46	<0.001	S
8.	Prevention of Complications	2.98	1.47	7.40	0.96	4.42	20.74	<0.001	S

Table 7 shows the area wise comparison of pre-test and post-test knowledge by t test. It reveals that the 't' value in all areas was significant at $p < 0.001$. This shows that Structured Teaching Programme was effective in increasing self-care knowledge of patients regarding diabetes mellitus.

3.6 Association of pre-test knowledge scores of diabetic patients with the selected demographic variables

To test the association between pre-test knowledge scores and selected demographic variables, the following null

hypothesis was formulated.

Null hypothesis (H_0):- There is no association between the mean pre-test self-care knowledge score of diabetic patients and the selected demographic variables.

Table 8: ANOVA value showing association of pre-test knowledge with demographic variables N=60

Sl. No.	Variable	Pre-test Knowledge score Mean \pm S D	Absolute Mean Difference	p value	Inference
1.	Age (in years):		1vs2: 2.264	0.354	NS
	1) 30-40	16.29 \pm 5.99	1vs3: 2.242		
	2) 41-50	18.54 \pm 4.05	1vs4: 0.875		
	3) 51-60	15.63 \pm 4.13	2vs3: 0.022		
	4) >60	17.64 \pm 4.72	3vs4: 1.367		
2.	Sex:	18.67 \pm 5.053	2.846	0.037	S
	1) Male	15.82 \pm 4.465			
	2) Female				
3.	Education:	15.75 \pm 3.872	1vs2: 1.562	0.029	S
	1) Illiterate	17.31 \pm 6.172	1vs3: 4.875		
	2) Up to 12 th	20.63 \pm 4.173	2vs3: 3.312		
	3) Above 12 th				
4.	Occupation:	19.91 \pm 3.727	3.787	0.010	S
	1) Employed	16.12 \pm 4.812			
	2) Self employed				
5.	Income / month (Rs):	22.00 \pm 4.243	1vs2: 6.250	0.253	NS
	1) \leq 5000	15.75 \pm 4.107	1vs3: 5.800		
	2) 5001-10,000	16.20 \pm 4.491	1vs4: 4.318		
	3) 10,001-15000	17.68 \pm 5.472	2vs3: 0.450		
	4) \geq 15,001		3vs4: 1.482		
6.	Residence:	16.88 \pm 5.019	0.175	0.063	NS
	1) Rural	16.70 \pm 4.566			
	2) Urban				
7.	Duration of Illness:	15.63 \pm 5.214	1vs2: 2.264	0.541	NS
	1) < 2 yrs	17.89 \pm 5.326	1vs3: 2.242		
	2) 3-5 yrs	17.87 \pm 5.290	1vs4: 0.875		
	3) 6-8 yrs	16.50 \pm 3.980	2vs3: 0.022		
	4) >9 yrs		3vs4: 1.367		
8.	Marital Status:	16.57 \pm 4.725	2.148	0.365	NS
	1) Married	18.71 \pm 5.619			
	2) Unmarried				

S: Significant
NS: Not Significant.

The data in Table-8 shows that the ANOVA (p) value computed between pre-test knowledge score and selected

demographic variables: Sex, education and occupation was 0.037, 0.029 and 0.010 respectively and was significant at

0.05 levels. Thus, it can be interpreted that there was significant association between pre-test knowledge score and demographic variables -sex, education, and occupation. Hence, null hypothesis (H_0)- there is no association between the mean pre-test self-care knowledge score of diabetic patients and the selected demographic variables was rejected and research hypothesis (H_1)-there is association between the mean pre-test self-care knowledge score of diabetic patients and the selected demographic variables was accepted.

It is also depicted from the table that the ANOVA (p) values computed between pre-test knowledge score and selected demographic variables- Age, income, residence, duration of illness and marital status was 0.354, 0.253, 0.063, 0.541 and 0.365 respectively and were not significant at 0.05 levels. Thus, it can be interpreted that there was no association between pre-test knowledge score and selected demographic variables- Age, income, residence, duration of illness and marital status.

Hence, null hypothesis (H_0)- there is no association between the mean pre-test self-care knowledge score of diabetic patients and the selected demographic variables is accepted and research hypothesis (H_1)-there is association between the mean pre-test self-care knowledge score of diabetic patients and the selected demographic variables was rejected.

4. Discussion

Demographic profile

Majority of the patients i.e. 19 (31.7%) were in the age group of 51-60 yrs, most of them 39 (65.0%) were female patients, 36 (60%) were illiterate, 49(81.7%) were self employed, 22(36.7%) had ≥ 15001 Rs income/month, 40(66.7%) were from rural areas, 20(33.3%) were having diabetes from more than 9 years and 53(88.3%) were married.

Section II: Clinical information of patients

Majority of the patients i.e. 29(48.33%) patients were in range of 55-69kgs, 23(38.33%) had height from 162-167Cms, 35(58.3) had no family history of diabetes, 29(48.3%) had hypertension, 60(100%) were on injection insulin, 33(55.0%) were administering insulin by themselves, 26(43.33%) with BMI 18-24.9kg/m² had normal weight and only 1(1.67%) with BMI 35-39.9kg/m² had class II obesity.

This finding revealed that diabetes mellitus can also develop among people whose body mass index is within normal limits.

The findings were supported by a study conducted in Korea. They identified that body mass index for all the patients in experimental group (20) and in control group (16) was within normal limits^[12]. This study has proved that diabetes can also occur among people whose body mass index is within normal limits.

4.1 Relevance of findings

4.1.1 To assess the existing level of knowledge regarding self-care among the patients with diabetes mellitus by pre-test.

In the present study, the pre-interventional score shows that majority of the patients 55 (91.7%) had inadequate

knowledge regarding self-care of diabetes mellitus before the administration of structured teaching programme. 5 (8.33%) of them had moderately adequate knowledge and none of them had adequate knowledge.

The findings of this study were supported by an evaluatory study conducted in Bangalore in 2005. The study showed that 51 (85%) had inadequate knowledge and 9 (15%) had moderately adequate knowledge in the pre-test. After administration of structured teaching programme, 56(93.3%) patients had adequate knowledge of self-care and 4 (6.7%) patients had moderately adequate knowledge^[13].

It was revealed that by area wise knowledge aspect, the mean pre-test knowledge score obtained by the patients was maximum in general information regarding diabetes mellitus and was 44%. It was minimum in the area of foot care (29.25%).

4.1.2 To evaluate the effectiveness of a structured teaching programme on self-care of patients with diabetes mellitus by post-test score.

The analysis result of the present study showed that the mean post-test knowledge score obtained by the patients was improved to 80.46% from a mean pre-test knowledge score of 35.04%. With the structured teaching, 28.33% patients were found to have moderate knowledge and remaining 71.67% had acquired adequate knowledge regarding self-care of diabetes mellitus. This gives an inference that the structured teaching programme was effective in improving the knowledge level of patients regarding self-care of diabetes mellitus.

The findings of the study were supported by an evaluatory study conducted in Bangalore to assess the effectiveness of a planned teaching programme on self-care for patients with diabetes mellitus in a selected Community at Mangalore. The sample for the study was 30 diabetic patients selected by purposive sampling technique. The significance of difference between the means of pre-test and post-test knowledge scores was computed. It showed that the obtained 't' value (22.1) was significant at 0.05 level. The findings of the study revealed that the mean post-test score (93.63) was apparently higher than the mean pre-test score (33.8) indicating that the planned teaching programme was effective^[14].

It was revealed that by area wise knowledge aspect, the mean post-test knowledge score obtained by the patients was maximum in area of general information regarding diabetes mellitus (91%) and minimum in the area of diet (69%).

4.1.3 To associate the pre-test knowledge scores with selected demographic variables.

The ANOVA (p) value computed that there was significant association between pre-test knowledge score and demographic variables -sex, education, and occupation (0.037, 0.029 and 0.010 respectively and was significant at 0.05 level).

It was also depicted that there was no association between pre-test knowledge score and selected demographic variables- Age, income, residence, duration of illness and marital status (0.354, 0.253, 0.063, 0.541 and 0.365 respectively).

4.2 Hypothesis Testing

The Hypotheses are tested at a 0.05 level of significance

4.2.1 Research hypothesis (H₁):-There is significant difference between mean pre-test and post-test self-care knowledge scores of diabetic patients.

It was evident that mean post-test knowledge score (38.62) was higher than the mean pre-test knowledge score (16.82) i.e. the mean difference was 21.80. The computed paired 't' test value ($t_{49} = 39.697$, $p < 0.001$) shows high significance (at the level $\alpha = 0.05$).

Hence the null hypothesis (H₀) there is no difference between pre-test and post-test overall mean scores was rejected and research hypothesis (H₁) was accepted i.e. there is significant difference between mean pre-test and post-test knowledge score on self-care of patients with diabetes. Therefore it can be interpreted that the structured teaching programme was effective in improving the knowledge of patients regarding self-care of diabetes.

4.2.2 Research hypothesis (H₂):- There is significant association between the mean pre-test self-care knowledge score of diabetic patients and the selected demographic variables.

The ANOVA (p) value computed states that there was significant association between pre-test knowledge score and demographic variables -sex, education, and occupation (0.037, 0.029 and 0.010 respectively and was significant at 0.05 level). Hence, we rejected the null hypothesis (H₀)-there is no association between pre-test knowledge score and selected demographic variables, and we accepted the Research hypothesis (H₀) there is association between pre-test knowledge score and selected demographic variables.

It was also depicted that there was no association between pre-test knowledge score and selected demographic variables- Age, income, residence, duration of illness and marital status (0.354, 0.253, 0.063, 0.541 and 0.365 respectively). Hence, we accepted the null hypothesis (H₀) there is no association between pre-test knowledge score and selected demographic variables, and we rejected the Research hypothesis (H₀) there is association between pre-test knowledge score and selected demographic variables.

5. Conclusions

The main aim of the study was to assess the effectiveness of structured teaching programme on knowledge regarding self-care of diabetes mellitus among patients with diabetes mellitus. Information was given to the diabetic patients through a structured teaching programme which includes various aspects like, general information of diabetes mellitus, diet, exercise, medication/insulin administration, self monitoring of blood glucose, foot care, follow up, prevention of care.

The following conclusions were drawn on the basis of findings of the study:

- The pre-test findings showed that knowledge of patients regarding self-care of diabetes mellitus was inadequate.
- The administration of structured teaching programme helped the patients to understand more about diabetes mellitus and its self-care.
- Most of the patients were having adequate level of knowledge after the teaching programme.
- The structured teaching programme was proved to be very effective method of transforming information.

Limitations

The following points were beyond the control of the investigator:

- Study was limited to those willing to participate in the study.
- Study sample was small.
- The study was limited to patients above 30 years of age.
- The study was confirmed in a selected hospital, which obviously imposed limits to larger generalizations.
- No attempt was made to measure the retention of knowledge regarding self-care after post-test.
- The study did not use any control group.

Recommendations

On the basis of the findings of the study, the following recommendations have been made for further study:

- The study can be replicated on a larger sample using random sampling so that the findings can be generalised.
- A study can be conducted to assess the long-term effects of individual structured teaching programme in families and communities.
- A comparative study can be conducted between clients with type I and type II diabetes mellitus.
- Studies can be conducted to identify the occurrence of complications among patients with diabetes mellitus.
- An experimental study can be under taken with control group for effective comparison.

6. References

1. Gala DR, Gala S. Diabetes, high blood pressure without any fear. Mumbai: Navneet Publications (India) Ltd. 2004.
2. http://www.care-diabetes-journal-org/cgi/content/full/25/supp_1/s80.
3. DCCT Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. The Diabetes Control and Complications Trial Research Group. N England Journal of Medicine 1993; 329(14):977-986.
4. Orem DE. Nursing: Concepts of Practice. 4th ed. St. Louis, MO: Mosby-Year Book Inc, 1991.
5. Hoy B, Wagner L, Hall EO. Self-care as a health resource of elders: an integrative review of the concept. Scand J Caring Science. 2007; 21(4):456-466.
6. Peyrot M, Rubin RR, Lauritzen T, Snoek FJ, Matthews DR, Skovlund SE. Psychosocial problems and barriers to improved diabetes management: results of the Cross-National Diabetes Attitudes, Wishes and Needs (DAWN) Study. Diabetes Medicine. 2005; 22(10):1379-1385.
7. Type 2 diabetes. Health Technology assessment of screening, diagnosis and treatment. 2005. Copenhagen, Denmark, National Board of Health, Danish Centre for Evaluation and Health Technology Assessment. Danish Health Technology Assessment. 2005; 7(1).
8. Brunner, suddarth's. The Text Book of Medical Surgical Nursing. 11th edition Wolter kluwer limited New Delhi, 2, 1376-1378
9. Norris SL, Lau Jaa Smith JS, Engeglan MM. Self management education for adults with type II diabetes mellitus. Diabetes care. 2002; 25(7):1159-64.

10. Glasgow RE. Outcomes of & for diabetes education research. *The Diabetes Educator*. 1999; 25(6):74-78.
11. Kaur K, Singh MM, Kumar, Walia I. Knowledge & self-care practices of diabetics in a resettlement colony of Chandigarh. *Indian Journal of Medical Science*. 1998; 52(8):341-47.
12. Kim HS, Ahoh J. Adherence to diabetes control recommendations: impact of nurse telephone calls. *Journal of Advanced Nursing*. 2003; 44:256-61.
13. Ramesh S. A study to assess the effectiveness of STP on knowledge and attitude of self-care among patients with diabetes mellitus at selected hospitals in Tumkur, 2005. www.Pubmed.com
14. Jaisy TJ. A study to assess the effectiveness of PTP on self-care for patients with diabetes mellitus in a selected Community at Mangalore, 2005. www.Pubmed.com.