Research Article

EFFECTIVENESS OF STRUCTURED TRAINING PROGRAM ON THE KNOWLEDGE AND SKILL OF PATIENTS SUFFERING FROM TYPE 2 DIABETES MELLITUS REGARDING SELF-MONITORING OF BLOOD GLUCOSE LEVEL AT THE SELECTED TERTIARY CARE HOSPITAL SETTING

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Abstract

People with diabetes require regular blood glucose monitoring to help them achieve as close to normal blood glucose levels as possible. Patients in the hospital setting are likely to have inconsistent blood glucose levels as they are affected by changes in diet and lifestyle, surgical procedures, and the stress of being in a hospital. The physician will prescribe how regularly the blood glucose monitoring is performed, it is usually the responsibility of the nurse to carry out and it may continue after discharge by the patient and family. Self-glucose monitoring is an important part of self-care after discharge. However, it has been stated that discharged diabetes patients lack the required knowledge for glucose monitoring. The methodology used was a Qualitative approach. The sample selected was Type –II diabetes mellitus patients> 18 years of age group. The pre-test was taken, structured teaching was given, and a post-test was taken, which showed a significant increase in the knowledge of the sample regarding self-glucose monitoring and competency assessment conducted for each sample followed by demonstration learning. Pre-test means 4.48 and post-test 8.4 after administering Patient and family education.

INTRODUCTION

"Diabetes is not curable. It's sustainable." By Alvin Leung
The number of people with diabetes rose from 108 million in 1980 to 422 million in 2014. Prevalence has been rising more rapidly in low- and middle-income countries than in high-income countries. Diabetes is a major cause of blindness, kidney failure, heart attacks, stroke, and, lower limb amputation. Between 2000 and 2019, there was a 3% increase in diabetes mortality rates by age. In 2019, diabetes and kidney disease due to diabetes caused an estimated 2 million deaths. A healthy diet, regular physical activity, maintaining normal body weight, and avoiding tobacco use are ways to prevent or delay the onset of type 2 diabetes. Diabetes can be treated and its consequences avoided or delayed with diet, physical activity, medication, and regular screening and treatment for complications (WHO, 2022). Self-monitoring of blood glucose levels (self-monitoring of blood glucose level) is widely accepted as being beneficial for long-term glycemic control in type 2 diabetes, both with or without insulin therapy (Schnell *et al.,* 2013). However, limitations and poor adherence to regular self-monitoring of blood glucose levels exist due to inconvenience, and lack of knowledge about self-monitoring of blood glucose levels resulting in suboptimal glycemic control. In this study (H1 & H2) are achieved (H1 -There will be a significant improvisation in the skill of self-glucose monitoring, and H2-There will be a significant improvement in knowledge about self-glucose monitoring). H0 is rejected (H0-There are no significant changes in knowledge about self-glucose monitoring and improvisation in skill)

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MATERIALS AND METHODS

The study was conducted from August 2022 – to September 2022. A qualitative research approach with pre-test and post-test research design was used to assess the knowledge regarding self-monitoring of blood glucose levels at the Apollo Hospitals Nashik. Permission from the Medical Superintendent at Apollo Hospitals Nashik and ethical clearance from the organizational ethical committee were taken before starting the study. A total of 50 samples were taken (Type –II Diabetes mellitus). A convenient sampling technique was used for data collection. The inclusion criteria for sample collection is "Patients who suffer from type – II diabetes mellitus more than >18 years of age". The subjects were given a structured questionnaire form to fill out and give responses. Before the questionnaire was given to the participants, consent was taken, and aims and objectives were explained to them. The structured questionnaire to assess the knowledge regarding self-monitoring of blood glucose levels has two sections. Section 1 consists of demography formality including 6 items to collect information on the subject's demography characteristics (age, gender, Duration of illness, Type of diet, Educational status, Treatment/ Management prescribed by a doctor for Diabetes mellitus). Section 2 consists of a structured knowledge questionnaire including 15 multiple-choice questions to assess the knowledge regarding self-monitoring of blood glucose levels. The maximum score was 2 for each correct answer and no score was awarded for an incorrect answer. The pre-test was taken and then structured teaching was given with the help of a lesson plan (educational template) (Annexure 1) and demonstration method followed by this post-test and competency assessment performed for each individual (Annexure 2)

The knowledge level grading criteria were considered as follows:

| Score Knowledge level	Score Knowledge level
<50%	Poor
50-75%	Average
>76-100%	Good

RESULTS

Descriptive (Frequency &percentage) and inferential statistics (t-test) were used to assess the effectiveness of patient education on self-monitoring of blood glucose levels.

**Table 1. Study sample distribution by sociodemographic characteristics**

Variable	Option	Frequency	Percentage
Gender	Male	29	58
	Female	21	42
Age group	18-30 years	5	10
	30-60years	36	72
	>60years	9	18
Duration of illness	0-1 month	1	2
	1-6 months	4	8
	6 months – 1 year	15	30
	1-3 years	26	52
	>3 years	4	8
Type of diet	a) Vegetarian	18	36
	b) Non-vegetarian	31	62
	c) Vegan	1	2
Type of treatment	a) Antihyperglycemic agents	9	18
	b) Insulin therapy	7	14
	c) Other (Dietary management, lifestyle modification)	4	8
	d) Combination of above points	30	60
Educational Status	c) 5th- 10th	8	16
	d) Up to 12th	12	24
	e) Diploma/ Graduate	27	54
	f) PG or above	3	6

Table-1 depicts subject distribution by socio-demographic characteristics
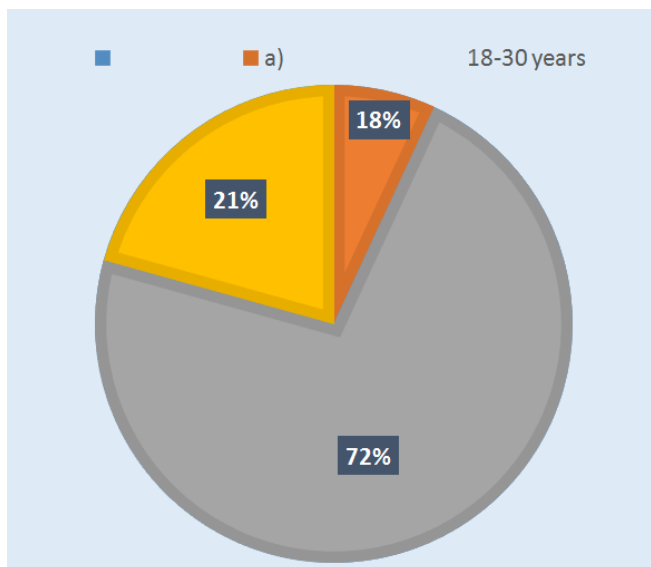
Figure 1. Frequency & percentage of subject according to age

Figure-1 depicts that the highest percent (58%) of the study samples were male and the lowest percent (42%) of the study samples were female. In this subject group (18%) of the (18-30 years age group), (72%) of them in the (30-60) years age group, (21%) of them (>60) years age group.
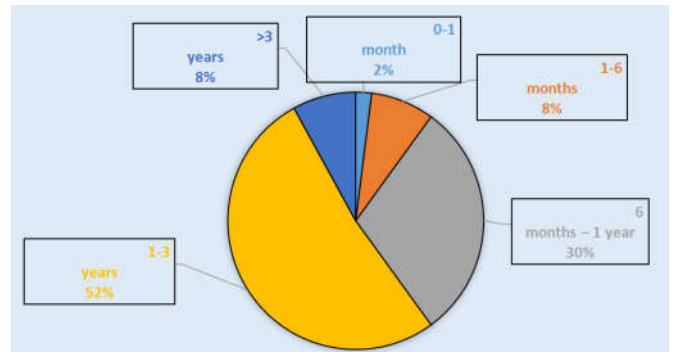
Figure 2. Frequency & Percentage of subject according to Duration of illness

Figure-2 depicts that the highest percent in this subject group (52%) of the (1-3years duration of illness), (30%) of them at the (6 months -1 year duration of illness), (8%) of them in (> 3 years duration of illness), (8%) of them at the (1months -6 months duration of illness, and (2%) of them in (0-1 month duration of illness)
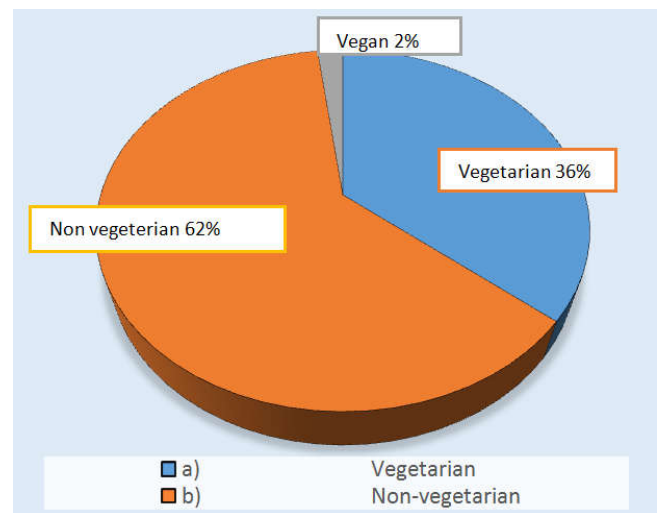
Figure 3. Frequency & Percentage of subject according to

Type of diet

Figure-3 depicts the highest percentage in this subject group (62%) of (non-vegetarians), (36%) of them (vegetarians), (2%) of them (vegan).
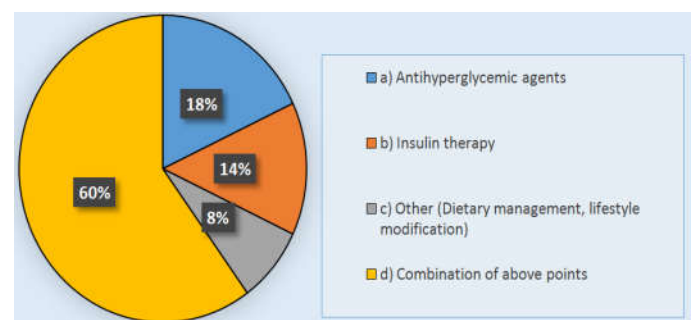
Figure 4. Frequency & Percentage of subject according to Type of treatment

Figure-4 depicts that the highest percent in this subject group (60%) of the (combination of the above points), (18%) of them at the (Antihyperglycemic agents), (14%) of them in (Insulin therapy), (8%) of the (other –dietary management, lifestyle modification).
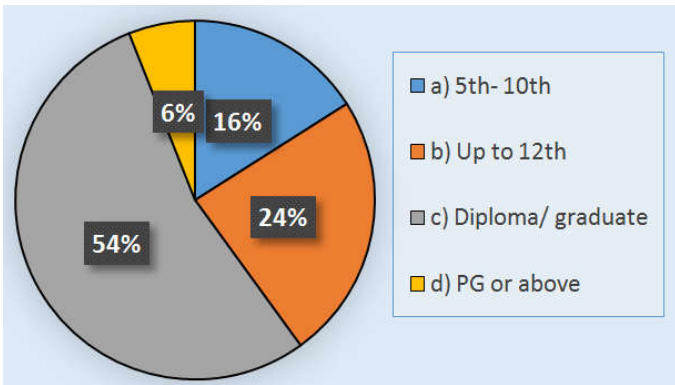
Figure 5. Frequency & Percentage of subject according to educational status

Figure-5 depicts that the highest percent in this subject group (54%) of the (diploma/graduate), (24%) of them at the (up to 12th), (16%) of them (5th-10th), (6%) of them (PG or above).
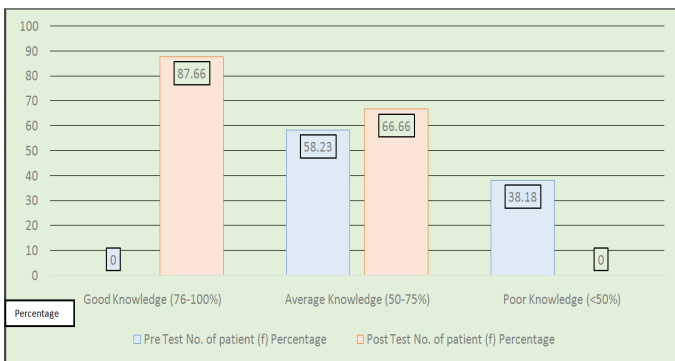

Figure 6. Pre-test and Post-test analysis

Figure-6 depicts the frequency and percentage distribution of the subjects' pre-test and post-test knowledge scores. The data presented in figure 6 shows that (38.18%) of subjects had poor knowledge, (58.23%) of subjects had average knowledge in the pre-test regarding knowledge of self-monitoring of blood glucose level, and most (87.66%) subjects had good knowledge, (66.66%) subjects had average knowledge and no subjects had poor knowledge in post-test regarding knowledge on self-monitoring of blood glucose level
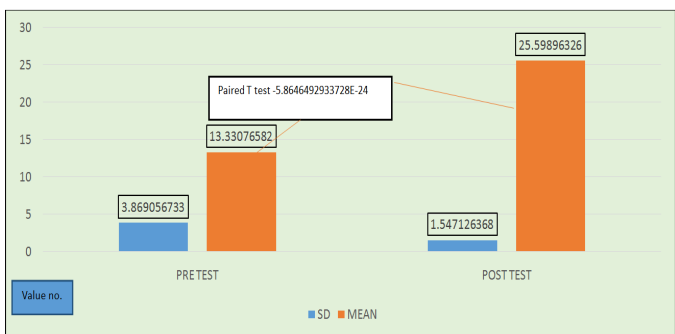
Figure 7. Frequency & distribution of subject Mean, SD, Paired t-test value related pre-test & post-test

Figure-7 depicts the mean, standard deviation, and paired t-test scores of structured knowledge questionnaires. The mean score & standard deviation of the post-test (mean 25.59, SD = 1.54) were significantly higher than the mean score & standard deviation of the pre-test (mean 13.33, SD = 3.86) the average result of the pre-test and post-test (5.8646492933728E-24) as per the paired t-test.
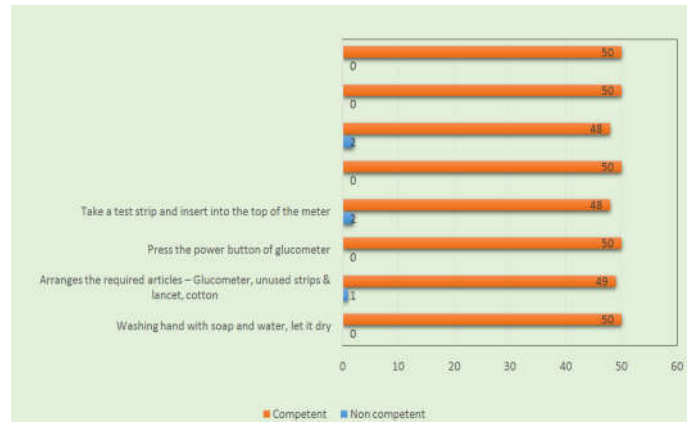
Figure 8. Subject competency mapping

Figure 8 depicts the competency assessment of subject demonstration for self-monitoring of blood glucose level by individual subjects followed by demonstration education in this 98% of all subjects demonstrated self-monitoring of blood glucose level appropriately. So the research hypothesis is accepted (H1) and the null hypothesis (H0) is rejected.

DISCUSSION AND CONCLUSION

This study was conducted to analyze the effectiveness of a structured training program on the knowledge and skill of patients suffering from Type 2 Diabetes mellitus regarding self-monitoring of blood glucose levels. A quantitative, one-group pretest-posttest design research approach was used to collect the data. The target population was patients who have a type–II diabetes mellitus. The data collection period lasted for months from July 22 to September 22. After collecting the data using a structured tool from the patients, the data were analysed using descriptive and inferential statistics. The present study findings were revealed in terms of the objectives of the study. Data shows that (38.18%) of subjects had poor knowledge, (58.23%) of subjects had average knowledge in the pre-test regarding knowledge of self-monitoring of blood glucose level, and most (87.66%) of subjects had good knowledge, (66.66%) subjects had average knowledge and no subjects had poor knowledge in post-test regarding knowledge on self-monitoring of blood glucose level. The calculated average result of the pre-test and post-test is (5.8646492933728E-24) as per paired –t-test. The present study findings reveal that the knowledge of subjects increased after administering structured teaching programs on self-monitoring of blood glucose levels, The results of this study are congruent with the study conducted by Nitendra Chaurasia in rural Nepal where 61 (31.77%) has poor knowledge, 110 (57.29%) had average knowledge score and 21 (10.93%) had good knowledge of diabetes mellitus [3]

Recommendations

Based on the conclusions, the study recommended the following:

1. Further study with replication of the current study on a larger sample is recommended to achieve wider utilization of the designed educational program for a better quality of care.
2. Nurse's ongoing motivation for patient education regarding self-monitoring of blood glucose level with demonstration.

REFERENCES

1. Diabetes (no date) World Health Organization. World Health Organization. Available at: https://www.who.int/news-room/fact-sheets/detail/diabetes (Accessed: December 29, 2022).
2. 12. Schnell OAH, Battelini T, Ceriello A, *et al* Self monitoring of blood glucose in type 2 diabetes: recent studies. J Diabetes Sci Technol 2013; 7: 479–488. [PMC free article] [PubMed] [Google Scholar]
3. Nitendra Chaurasia, Rimu Mishra, et.al "A Self Care Management Awareness Study among Diabetes Mellitus Patients in Rural Nepal." American Journal of Public Health Research, vol. 3, no. 5A (2015): 67-71. doi: 10.12691/ajphr-3-5A-15.
4. https://ctsi.ucla.edu/researcher-resources/files/docs/sop-glucose-monitoring.pdf

ANNEXURE

Annexure 1. Structured teaching education template on self-monitoring of blood glucose level[4]

Annexure 2. Nurse giving structured teaching program on *self-monitoring of blood glucose level*

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