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Risk assessment of stroke and effect of structured teaching programme on knowledge regarding stroke among diabetes mellitus patients

[1]Bibymol.T H, Lecturer, Amrita College of Nursing, Health Science Campus, Kochi - 41, India.

Corresponding Author: Bibymol. T H, Lecturer, Amrita College of Nursing, Health Science Campus, Kochi - 41, India.

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Abstract

Objectives: The Objectives of the study were to assess the risk factors of stroke among diabetes mellitus patients and to evaluate the effectiveness of structured teaching programme on knowledge regarding stroke among diabetes mellitus patients. It also aimed to find out the association between the level of knowledge regarding stroke among diabetes mellitus patients with selected sociopersonal and clinical variables.

Material and Methods: A Pre experimental one group pre-test post-test design was used to conduct this study. Convenient sampling was the sampling method used to collect data from diabetes mellitus patients on the basis of structured knowledge questionnaire and Stroke risk assessment tool. On the first day, sociopersonal and clinical variables were collected, the risk assessment of stroke was done by using stroke risk assessment tool and to those who were on moderate and high risk of stroke, pre-test was done using a knowledge questionnaire. On the same day, structured teaching programme regarding stroke was also administered as an intervention to the subjects. Post-test level of knowledge was assessed after 5 -7 days of the intervention. The sample characteristics were described by frequency, percentage and effect of structured teaching programme on knowledge regarding stroke was assessed by paired t test. Chi square test was used to find the association between level of knowledge regarding stroke and selected sociopersonal and clinical variables.

Results: The mean pretest knowledge score was 12.1 and mean posttest knowledge score was 24.5. The effect of structured teaching programme was analysed using paired t test and t value for knowledge (t_{59} =23.2) was found to be statistically significant at 0.05 level and there was significant association between pretest knowledge score and clinical variables such as FBS, BMI and total cholesterol.

Conclusion: The structured teaching programme had a significant effect on improving the knowledge regarding stroke among diabetes mellitus patients. It made the awareness regarding stroke and its preventive aspects.

Keywords: Risk factors, Effect, Structured teaching programme, Stroke, Diabetes mellitus patients.

Introduction

Stroke and Diabetes mellitus (DM) are two of the leading causes of death worldwide [1]. Currently, the stroke incidence in India is much higher than Western industrialized countries [2]. Diabetes mellitus is an important risk factor for the development of stroke. The cerebrovascular diseases in patients with DM are the most severe complications, especially in patients with type 2 DM. Compared with the group of cerebrovascular diseases without DM, the pathogenesis, clinical characteristics, treatment and the prognosis are more complicated in those with DM [3]. To prevent stroke among diabetes mellitus patients, behaviour modification, dietary modification, control of overweight and obesity, increased physical activity, prevention of smoking and alcohol excess is essential. Early identification of patients with stroke and treatments with appropriate medical and lifestyle management improves the quality of life. The present study aimed to assess the risk factors of stroke and evaluate the effect of structured teaching programme on knowledge regarding stroke among diabetes mellitus patients. The hypothesis of the study were

H1: There is significant difference in the mean pre-test and post-test level of knowledge regarding stroke among diabetes mellitus patients after the intervention

H2: There is significant association between the level of knowledge regarding stroke among diabetes mellitus patients with selected sociopersonal variables

Materials and methods:

A Quantitative evaluative approach was used with pre-experimental one group pre-test post-test design. The population for the study comprised of diabetic patients from different departments of Medical Trust Hospital, Kochi. Convenient sampling technique was used to collect the samples considering the inclusion and exclusion criteria. The following criteria were set by the researcher for the selection of the samples.

Inclusion criteria

Patients diagnosed with diabetes mellitus who are

1. Willing to participate in the study
2. Available at the time of data collection
3. Age between 30 – 75 years

Exclusion criteria

1. Patients who are unable to follow instruction
2. Hemodynamically unstable patients

Risk assessment was done for 64 diabetic patients using stroke risk assessment tool. Among these, 60 diabetic patients who were found at moderate and high risk were selected as samples. Knowledge regarding stroke were assessed by structured knowledge questionnaire. After the pre-test the investigator administered the structured teaching programme regarding stroke. Post-test was done after 5 -7 days of the intervention using the same tool. Questionnaire includes both sociopersonal and clinical variables. - Sociopersonal data consist of 10 questions which includes Age, Gender, Type of family, Religion, Marital status, educational status, Occupation, previous knowledge about stroke, Source of information, Any close relatives affected with stroke. Clinical variables consist of 6 questions that includes BMI, FBS, PPBS, HbA1c, Total cholesterol and Blood pressure. The risk of stroke among diabetic patients was assessed by stroke risk assessment tool consisting of 9 items and structured knowledge questionnaire consist of 30 questions regarding stroke.

Development of Structured Teaching Programme (STP)

The STP was developed based on the review of the related research / non-research literature and the

objectives stated. The following steps were adopted to develop the STP

Formulation of objectives:

Objectives of the structured teaching programme are listed in behavioural and achievable terms. The outline of the content was written based on the objectives.

Review of literature:

An extensive literature review was undertaken regarding prevention of diabetic complications such as stroke from text books, internet, articles and journals.

Preparation of first draft of teaching content:

The first draft was prepared based on the review of literature and expert opinion. The teaching plan consisted of central objectives, specific objectives, teaching and learning activities, description of audiovisual aids and evaluation. The content was made clear and comprehensive keeping in view the teachers capacity to comprehend the information. The areas covered in content are anatomy of pancreas, definition of diabetes mellitus, types, clinical manifestations, diagnostic evaluation, complications, management, definition of stroke, risk factors, pathway to stroke, clinical manifestations and preventive measures of stroke.

Deciding the method of instruction and audiovisual aids:

The method of instruction adopted was lecture cum discussion. Visual aids like power point, charts, hand out, flash card was used.

Content validation:

The prepared structured questionnaire and lesson plan along with the blue print, objectives, and criteria check list were given to nine experts from the field of medicine and medical surgical nursing to ensure content validity. Those items having individual content validity index more than 80% were accepted and the questions were modified based on the inputs of the experts in consultation with the guide.

Preparation of final draft:

Based on the suggestions and opinions of the experts, the final draft was prepared regarding stroke.

Pilot study

Pilot study was conducted among diabetes mellitus patients admitted in Medical Trust Hospital, Ernakulam with 10% sample size (6). Pilot study was conducted in the month of February at Medical Trust Hospital, Kochi. An administrative approval was obtained to conduct the study. A total of 10 samples were assessed for risk and 6 samples selected, who were found to be at moderate and high risk of stroke. Self-introduction was done to the subjects by the researcher and purpose of the study was explained. Informed consent was taken from samples before conducting the study. Risk assessment was done and pretest was administered with structured knowledge questionnaire, to the selected samples who were found to be at risk. On the same day structured teaching programme regarding stroke was also administered. The duration of the session was 30 minutes. Post test was conducted after 5 – 7 days of administration of STP.

Plan for data analysis

Data were analysed using descriptive and inferential statistics.

1. Sociopersonal and clinical variables were analysed using frequency distribution and percentage illustrated with tables and figures
2. Knowledge were analysed using mean and standard deviation
3. Effect of structured teaching programme on knowledge regarding stroke was assessed by paired t test.

4. Chi square test was used to find the association between level of knowledge regarding stroke and selected sociopersonal and clinical variables.

Ethical consideration:

Ethical clearance for the study was obtained from Medical Trust Hospital ethics committee dated 30th January 2019 and letter no. MTH/EC/0646/2019. After the detailed explanation about the study a written informed consent was taken from the patients and confidentiality of the information given by the sample was ensured. The sample was informed that they can terminate from the study at any point of time.

Patient consent

Written consent was obtained from the patient

Results

Hypothesis

H1: There is significant difference in the mean pre-test and post-test level of knowledge regarding stroke among diabetes mellitus patients after the intervention

H2: There is significant association between the level of knowledge regarding stroke among diabetes mellitus patients with selected sociopersonal variables

Organization of the findings

Section I: Distribution of samples based on socio personal and clinical variables

I a: - Figure1: - In this study highest percentage of samples (56.7%) belongs to the age group of 58-75 and lowest (6.7%) in 30-43 age group and 36.6% of study samples were included in the age group of 44-57.

I b: - Table 1: - shows frequency and percentage distribution of samples according to their gender, type of family, religion and marital status. 56.7% of the samples were males and 43.3% were females. The highest percentage of samples (81.7%) were from nuclear family and 18.3% of subjects were from joint family. Majority (45%) of the samples are Christians, 38.3% are Hindu and 16.7% are Muslim. 93.3% of the samples got married, 3.3% are widows and 3.3% are divorced. No samples were included in single marital status.

I c: - Figure 2: - The highest percentage (62%) had primary education, 20% had degree, 16.7% had secondary education and 1.6% had no formal education

I'd: - Figure 3: - The highest percentage (46.7%) of the samples were home maker/ self-employed. 21.6% had daily wages, 11.7% of the samples were private employees and 20% of the samples were government employees.

I e: - Table 2: - This table shows frequency and percentage distribution of samples according to their previous knowledge of stroke, source of information and any close relatives affected with stroke. Majority of the samples (66.7%) knows regarding stroke, but 33.3% were unaware about stroke. The source of information for 30% of samples from family and friends and 25% from mass media and 10% from health personnel. 75% of the samples close relatives were not affected with stroke and 25% were affected with stroke.

I f: - Figure 4: - Highest percentage (29 samples, 48.3%) of samples had BMI between 25-30 which was overweight, 43.3% of samples (26 samples) had normal BMI (18-25) and 8.3% of samples (5 samples) had BMI above 30 which was considered as obesity. No samples were included in BMI below 18 (Underweight).

I g: - Table 3: - 26.6% of samples had FBS between 70 – 100 and 36.7% had FBS value between 101 – 125mg/dl. 36.7% of samples had FBS value more than 126mg/dl. 21.7% had PPBS less than 140 and 50% between 140 – 200. 28.3% had PPBS above 200mg/dl. 10% of samples had HbA1c less than 5.7 and 40% between 5.8 – 6.4. 50% had HbA1c more than 6.5. 51.6% of samples had

total cholesterol below 200 and 31.7% had between 200 – 239. 16.7% had total cholesterol above 240. 23.3% had systolic blood pressure less than 120mm of Hg and 58.4% had between 120 – 139. 15% had systolic blood pressure between 140 – 159mm of Hg and 3.3% had systolic blood pressure greater than 160 mm of Hg. 10% of samples had diastolic blood pressure less than 80 mm of Hg and 70% had between 80 – 90. 16.7% had between 91 – 99 and 3.3% had more than 100 mm of Hg.

Section II: Stroke Risk Assessment Findings

The risk of stroke among diabetic patients was assessed by stroke risk assessment tool consisting of 9 items. Risk groups were classified into three categories:

Low risk: 1 – 12

Moderate risk: 13 – 20

High risk: Above 20

II a: - Table 4: revealed 85% of samples were at moderate risk, 15% of samples were at high risk. Subjects in moderate and high-risk groups were selected as samples and subjects at low risk (4 samples, 6.67%) were not included in the study. For low-risk patients, Pamphlets was given.

Section III: Assessment of level of knowledge regarding stroke among diabetes mellitus patients

The knowledge of diabetic patients regarding stroke was assessed using structured questionnaire consisting 30 items. Each correct response was given a score of one. The highest score was 30. According to the total score obtained by each sample, knowledge was classified into four categories:

Excellent: 24 – 30

Good: 17 – 23

Average: 10 – 16

Poor: <10

III a: - Table 5: The table revealed the pretest and post-test level of knowledge score of samples regarding stroke among diabetes mellitus patients. In the pretest, Majority of the samples had average level of knowledge (60%) and 31.6% of samples had poor level of knowledge. Only 8.3% of samples were having good level of knowledge regarding stroke and none had excellent knowledge. In the post test, 68.3% had excellent knowledge and 31.6% had good knowledge.

Section IV: Effectiveness of structured teaching programme regarding stroke among diabetes mellitus patients

IV a: - Table 6: Table revealed that the calculated paired t value t_{59} = 23.2 is greater than the table value t_{59}=2.009. So the hypothesis H1 is accepted. Therefore it is clear that the structured teaching programme was effective in improving the level of knowledge regarding stroke among diabetes mellitus patients.

Section V: Association of mean pretest knowledge score of diabetic patients regarding stroke and selected sociopersonal and clinical variables

V a: - Table 7: **Association of pretest knowledge score of diabetic patients and selected sociopersonal variables: -** Table 7 showed that there was no association between sociopersonal variables and pretest level of knowledge score of diabetic patients.

V b: Table 8: **Association of pretest knowledge score of diabetic patients and selected clinical variables:** Table 8 showed that there was a significant association between Body Mass Index, FBS, Total cholesterol and pretest knowledge score. But there is no association between PPBS, HbA1c and blood pressure and pretest level of knowledge of diabetes mellitus patients.

Discussion

The findings of the study were discussed in terms of objectives and hypothesis of the study. The data collected from the findings of the present study was contrasted with the other similar studies conducted in other settings.

Section I: Sample Characteristics

The maximum number of diabetic patients (56.7%) were in age group of 58 – 75 years. 56.7% of the samples were males and 43.3% were females. The highest percentage (62%) had primary education, 20% had degree, 16.7% had secondary education and 1.6% had no formal education.

Section II: Stroke Risk Assessment Findings

Among 64 diabetic patients who were assessed for risk of stroke, 85% of the samples had moderate risk, 15% of the samples were on high risk and 6.67% of the samples had low risk. Moderate and high-risk groups were selected as samples. For low-risk patients, pamphlets was given. This finding was consistent with the cross-sectional study conducted by Fawaz Al-Hussain, Amira M. Youssef, Shazia N. Subhani et al (2016) to determine the prevalence and risk factors of ischemic stroke among diabetic patients registered in the Saudi National Diabetes Registry (SNDR) database. Univariate and multivariate logistic regression analyses were used to assess the roles of different risk factors. Good glycaemic, hypertension, and hyperlipidemia control, in addition to smoking cessation, are the cornerstones to achieve a significant reduction in ischemic stroke risk [4].

Section III: Assessment of level of knowledge regarding stroke among diabetes mellitus patients

In the pre-test, 60% of the subjects had average knowledge and 31.67% had poor knowledge and 8.3% had good knowledge and in the post-test 68.3% had excellent knowledge and 31.6% had good knowledge regarding stroke. This finding was consistent with cross sectional survey conducted by Gulabani.M, John.M, Issac. R (2005) in Christian medical college, Ludhiana. The questionnaire consisted of items that tested the patient's knowledge of diabetes, its treatment and complications. This study confirms that patient knowledge about the treatment and complications of diabetes is limited, especially with regards to 68 preventive aspects. There is a definite need to empower patients with the knowledge required to help them obtain maximum benefit from their treatment for diabetes [5].

Section IV: Effectiveness of structured teaching programme regarding stroke among diabetes mellitus patients

The mean pre-test knowledge score was 12.1 with standard deviation 3.5 and the post-test knowledge score was 24.5 with standard deviation 1.7. The calculated't' value (t_{59} = 23.2, $p<0.05$) shows that there is statistically significant difference in the pre-test and post-test level of knowledge regarding stroke. This finding was consistent with the quasi-experimental study conducted by Guramrit Kaur, Ishak Mohammad, Davinder Kaur (2013) at selected Inpatient Departments of Gian Sagar Hospital, Punjab to evaluate the effectiveness of Individualized Planned Teaching Programme on knowledge regarding prevention of complications of Diabetes Mellitus among Diabetic patients. According to the result of this study, individualized planned teaching programme has a favorable impact on knowledge regarding prevention of complications of Diabetes Mellitus among Diabetic patients [6].

Section V: Association of knowledge regarding stroke among diabetes mellitus patients and selected socio personal and clinical variables

The another objective of the present study was to find the association between pretest level of knowledge regarding stroke among diabetes mellitus patients and selected sociopersonal and clinical variables. The chi-square value of sociopersonal variables were not associated with the pretest level of knowledge of samples. The chi-square value of clinical variables showed association between FBS, BMI, total cholesterol with the pretest level of knowledge score and no significant association was found between other clinical variables such as PPBS, HbA1c and blood pressure. This finding was consistent with the study done by David Tanne, MD; Nira Koren Morag et al (2004) to examine the associations between clinical relevant categories of fasting glucose levels and the risk of incident ischemic stroke. During follow up period, baseline medical histories were obtained and plasma glucose and lipids assessed at a central study laboratory. This study showed that the association between fasting plasma glucose and ischemic cerebrovascular events in patients with pre-existing atherothrombotic disease is J shaped. And the rate increase for fasting plasma glucose levels >100mg/dl and also for those with low fasting glucose levels [7].

Table 1: Frequency and percentage distribution of samples according to their gender, type of family, religion and marital status (n=60).

Sn.	Socio personal variable	Frequency	Percentage
1	Gender		
	Male	34	56.7%
	Female	26	43.3%
2	Type of family		
	Nuclear family	49	81.7%
	Joint family	11	18.3%
3	Religion		
	Christian	27	45%
	Hindu	23	38.3%
	Muslim	10	16.7%
	Others	0	0
4	Marital status		
	Married	56	93.3%
	Single	0	0
	Widow	2	3.3%
	Divorced/ Separated	2	3.3%

Table 2: Frequency and percentage distribution of samples according to their previous knowledge of stroke, source of information and any close relatives affected with stroke. (n =60).

Sl.no	Socio personal variable	Frequency	Percentage
1	Do you know about stroke?		
	Yes	40	66.7%
	No	20	33.3%
2	If yes, Source of information		
	Family and friends	18	30%
	Health personnel	7	12%
	Mass media	15	25%
3	Any close relatives affected with stroke?	15	25%
	Yes	45	75%
	No		

Table 3: Frequency and percentage distribution of samples according to lab investigation values. (n=60).

Lab Investigation Results		
FBS	16	26.6%
70 – 100	22	36.7%
101- 125	22	36.7%
>126		
PPBS		
Less than 140	13	21.7%
140 – 200	30	50%
Above 200	17	28.3%
HbA1c		
<5.7	6	10%
5.8 – 6.4	24	40%
>6.5	30	50%
Total cholesterol		
Below 200	31	51.6%
200 – 239	19	31.7%
Above 240	10	16.7%
Blood pressure (Systolic)		
<120	14	

120 – 139	35	23.3%
140 – 159	9	58.4%
>=160	2	15%
Blood pressure (Diastolic)		3.3%
<80	6	
80 – 90	42	10%
91 – 99	10	70%
>100	2	16.7%
		3.3%

Table 4: Frequency and percentage distribution of samples based on stroke risk assessment (n=64).

Sl.no	Items	Frequency	Percentage
1.	Low risk	4	6.67%
2.	Moderate risk	51	85%
3.	High risk	9	15%

Table 5: Frequency and percentage distribution of samples based on pretest and post-test knowledge score. (n=60).

Level of knowledge	Pre test		Post test	
	Frequency	Percentage	Frequency	Percentage
Poor	19	31.67%	0	0%
Average	36	60%	0	0%
Good	5	8.3%	19	31.6%
Excellent	0	0%	41	68.3%

Table 6: Paired t test between pre-test and post-test level of knowledge score of diabetic patients regarding stroke. (n= 60).

	Mean	Standard Deviation	Df	t value
Pre test	12.1	3.5	59	23.2**
Post test	24.5	1.7		

**t_{59} = 2.0009 at $p<0.05$ level.

Table 7: Association of pretest knowledge score of diabetic patients and selected sociopersonal variables. (n=60).

Socio personal Variables	Chi square value	df	Table value
Age	.984	4	9.48
Gender	.189	2	5.99
Type of family	.121	2	5.99
Religion	4.70	4	9.48
Marital status	1.69	4	9.48
Education	5.76	6	12.5
Occupation	8.6	6	12.5
Previous knowledge	.330	2	5.99
about stroke	12.29	6	12.5
Source of information	.084	2	5.99
Any close relatives affected with stroke			

Table 8: Association of pretest knowledge score of diabetic patients and selected clinical variables (n=60).

Clinical variables	Chi square value	df	Table value
Body Mass Index	13.06**	4	9.48
Lab Investigation results			
FBS	13.25**	4	9.48
PPBS	3.37	4	9.48
HbA1c	5.45	4	9.48
Total cholesterol	10.70**	4	9.48
Blood	8.48	6	12.5
pressure(systolic)	6.97	6	12.5
Blood pressure (Diastolic)			

**Significant at 0.05 level.

Figure 1: Bar diagram showing percentage distribution of samples based on age.

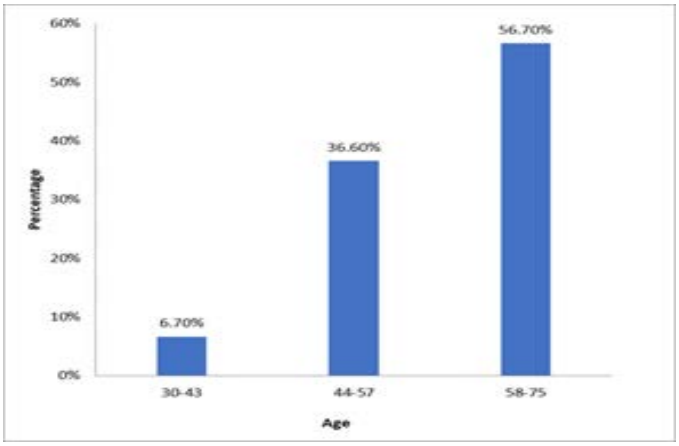


Figure 2: Pie diagram showing percentage distribution of samples based on education.

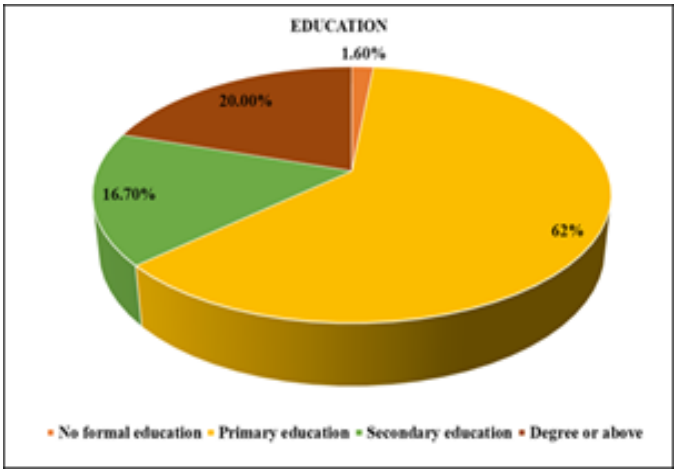


Figure 3: Cone diagram showing percentage distribution of samples based on occupation.

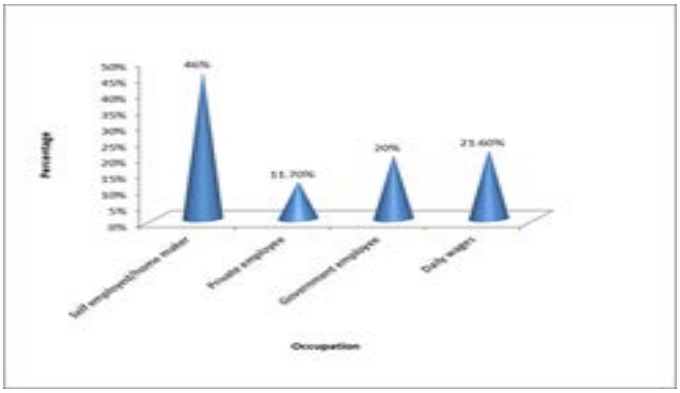
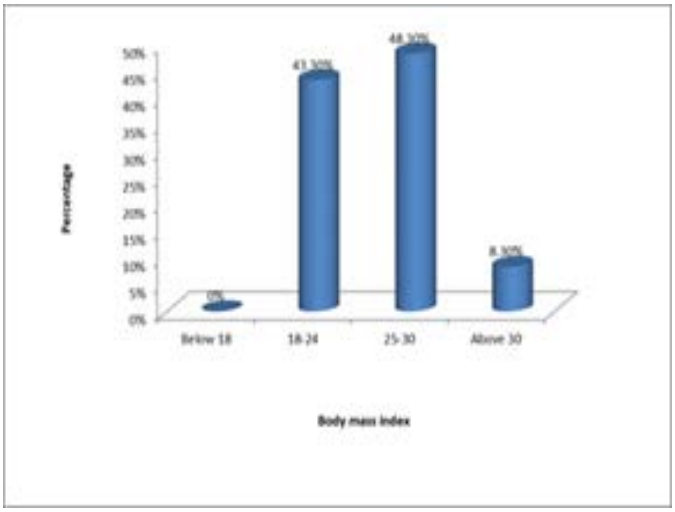


Figure 4: Cylindrical diagram showing percentage distribution of samples based on Body Mass Index (BMI).



Conclusion

Based on the findings of the study, the following conclusions were made: The structured teaching programme had a significant effect on improving the knowledge regarding stroke among diabetes mellitus patients. It made the awareness regarding stroke and its preventive aspects. In present study it was concluded that structured teaching programme was effective in improving the knowledge regarding stroke among diabetes mellitus patients.

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