A Study to Assess the Effectiveness of Structured Teaching Programme on Prevention of Microvascular and Macrovascular Complications Among Patients with Diabetes Mellitus in Selected Hospitals at Bangalore

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ABSTRACT

At present, India is considered as the diabetic capital of the world with approximately 35 million suffering from this disorder. The long term complications of Diabetes Mellitus (DM) like micro and macro vascular complications are becoming more common as more people live longer with diabetes. A study was conducted to assess the effectiveness of structured teaching program on prevention of micro vascular and macro vascular complications among patients with diabetes mellitus at KC General Hospital, Bangalore.

The research approach adopted for this study is an evaluative approach. The research design selected for this present study was Quasi-experimental design. The sample size consists of 50 DM patients, 25 in control group and 25 in experimental group. Purposive sampling technique was used to select the respondents. A structured knowledge questionnaire (SKQ) was administered to assess knowledge in pretest among experimental and control group on the first day. Structured Teaching Programme (STP) was administered on the same day of pretest to Experimental Group. SKQ was administered after 7 days of administration of STP to assess its effectiveness. The results of major findings indicate that the DM patients had inadequate knowledge regarding micro vascular and macro vascular complications and its prevention. STP was found to

be a very effective method of providing information regarding prevention of micro vascular and macro vascular complications. There was a significant difference between the pretest and posttest knowledge score on prevention of micro and macro vascular complications of DM among experimental and control group with a student 't' value of 26.52 which was significant at 5% level. There was significant association between the findings and demographic variables such as age group, type of family, family income and duration of illness. The study concluded that the STP on prevention of micro and macro vascular complications of diabetes mellitus was an effective method for providing moderate to adequate knowledge and help DM patients to enhance their knowledge to prevent vascular complications.

Keywords: Microvascular complications, macrovascular complications, artery, insulin, capillaries, arterioles, nerve, hyperglycemia, hypoglycemia.

INTRODUCTION

The World Diabetes Day which falls on November 14th, 2012 embodies the theme "Diabetes Education and Prevention", which will pervade all through the campaign during 2009-2013[1]. Diabetes mellitus (DM) is a multisystem disease related to abnormal insulin production, impaired insulin utilization or both. DM is a major public health problem all over the world. According to WHO report in the year 2000 the incidence of diabetes was 171 million and estimated to increase 366 million by the end of year 2030[2].

At present, India is considered as the diabetic capital of the world. There are approximately 35 million diabetics in India, and this figure is expected to increase up to 79.4 million by 2030. In Karnataka 22 to 26 percent are diabetic[3]. Around 3.2 million deaths every year are attributable to complications of diabetes; six deaths every minute. India tops the list of top 10 countries, in numbers of sufferers[2].

The management of diabetes is one of the most important subjects in clinical practice. In the Indian context, increasing urbanization, industrialization and changing lifestyles seem to be contributing to increasing prevalence of diabetes. Thus in order to provide the accurate information on Diabetes, a comprehensive teaching programme has been designed to provide the latest and the most relevant information on topics related to complications of diabetes, which the patients can apply in their day-to-day practice.

DM has become a common disease that leads to chronic complications like neuropathy, nephropathy, retinopathy, Cerebral Vascular Accident and cardiac diseases. People with diabetes are 25 times more likely to develop blindness, 17 times more likely to develop kidney disease, 30-40 times more likely to undergo amputation, two to four times more likely to develop myocardial infarction and twice more likely to suffer a stroke than non-diabetics[4]. There is significant risk in the incidence of DM in India. Development of chronic complications is related to the number of years of diabetes mellitus.

This is particularly alarming in developing countries like India where life expectancy is increasing rapidly. DM

patients are living longer because of better treatment modalities, thus preventing acute complications and premature deaths. Because of these impacts there is an increased DM population at a higher risk of developing chronic diabetes complications. The chronic complications of DM translate into a significant economic burden on the individual and the community because the treatment is expensive[3].

DM is a major endocrine disorder, which reduces life expectancy by 5 to 10 years. Premature cardiovascular disease is the most common cause of morbidity and mortality, but the micro vascular complications specific to DM are also contributory factors. DM is the most common reason for renal replacement therapy worldwide, the most common cause of blindness in the under 65s, and the most common cause of non-traumatic amputation. With our current knowledge, most of these devastating events could be prevented or delayed, or their impact can be minimized. This review focuses on prevention, early detection, and initial management of the vascular complications of DM[1].

A study was conducted to evaluate the baseline level of knowledge and awareness of diabetic patients about their disease and its complications. The results on awareness of complications of DM were low. The study included 1040 patients who were interviewed to know their knowledge attitude and practices about diabetes using a structured questionnaire. The awareness about the disease in majority of diabetic patients was not adequate in this study and routine individual teaching and counseling represents an effective educational model[4].

A study was conducted on 773 cases of DM with a view to find out the incidence, pattern of neuropathy as well as to ascertain its relationship with the degree and control of hyperglycemia. The results shown that, a high incidence of neuropathy was observed even among those diabetics with good control of hyperglycemia. Apart from the clinical examination, sensitive parameters like the study of nerve conduction velocity and tests for autonomic dysfunction were employed. Peripheral neuropathy was 81% and autonomic neuropathy was 48% were more common than mononeuropathy was 5% and amyotrophic was 2 %. In nearly 25 percent of the cases, sub clinical neuropathy existed and was detected either by nerve conduction studies or autonomic function tests[5].

An investigation was done on prevalence of vascular complications of DM by surveying 787 patients of south-Asian origin in diabetic clinics in the UK (n=351), Mauritius (n=173) and India (n=263) and found the prevalence of microvascular complications such as retinopathy (India 16.3%; Mauritius 2.3%; UK 2.6%), nephropathy (India 20.5%; Mauritius 10.5%; UK 2.3%) and neuropathy (India 8.4%; Mauritius 1.2%; UK 5.1%) complications to be significantly higher in India compared to Mauritius and the UK (p<0.05). Results suggested that microvascular complications are higher in India due to poorer diabetic control. The findings could be explained by late-onset presentation of diabetic patients in India due to the lack of primary care initiatives to screen and monitor treatment of T2DM. Furthermore, the poor diabetic control in India could reflect a dearth of clinical, evidence-based-knowledge regarding diabetic medication, educating the clients regarding possible complications amongst Indian health care personnel. In view of the global increase in T2DM, this is a major concern for Indian healthcare[6,7].

From the above studies it is clear that the incidence and prevalence of complications related to DM are high and consuming the major part of healthcare services. The researcher came across many diabetic patients during the time of clinical

postings and found that patients lack knowledge about the complications of diabetes and its prevention. It is observed by researcher that macro and micro vascular complications are common in diabetic patients which are poorly responds to treatment. Imparting appropriate knowledge regarding prevention of complications and care at home can prevent complications of DM. Hence, researcher felt the need to undertake this study to impart the knowledge on prevention of the micro vascular and macro vascular complication among DM patients.

MATERIALS AND METHODS

Sampling criteria specifies the characteristics of the sample in the population must possess. The following criteria are used in the present study to select samples.

Inclusion criteria
1. Patients who are diagnosed as either Type-I or Type-II DM.
2. Those who are willing to participate in the study.
3. Patients who are available at the period of study.
4. Those who can read and write English and/or Kannada.

Exclusion criteria
1. Patients with vascular complications of DM.
2. Patients associated with neurological disorders manifesting altered sensorium.

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
- Preparation of 1st draft of STP
- Content validity of the STP
- Pre testing of the STP
- Preparation of final draft of STP
- Description of STP

Preparation of 1st draft of STP
A first draft of STP was developed keeping in mind the objectives, criteria, checklist, literature reviewed and the opinion of experts. The main factors that were kept in mind while preparing STP were: the level of understanding of patients (samples), simplicity of language & relevance of illustration / pictures.

Content validity of STP
The initial draft of STP was given to eight experts comprising of five nurse educators from the field of Medical Surgical Nursing, two Medical Practitioners, and a statistician along with criteria checklist. The experts were requested to validate the STP based on the criteria checklist and to give suggestions, on the adequacy and relevance of content. There was 90% agreement on "Partially meets the criteria" of the content. A few validators asked to simplify the language. This suggestion was accepted and ensured the clarity and validity of the STP.

Preparation of final draft of STP
Suggestions from experts were taken into consideration & modifications of the tool were made. The final draft of STP was prepared after incorporating expert's suggestions.

Description of STP
The STP was titled "Prevention of micro and macro vascular complications of DM". The STP was prepared to enhance the knowledge of DM patients regarding causes, signs and symptoms, screening modalities and prevention of micro and macro vascular complications of DM. It consisted of the following content area.
$\Rightarrow$ Definition of DM.

⇒ Meaning of microvascular complications of DM.
⇒ Meaning of macrovascular complications of DM.
⇒ Microvascular complications of DM.
⇒ Macrovascular complications of DM.
⇒ Prevention of microvascular complications of DM.
⇒ Prevention of macrovascular complications of DM.
⇒ Diet management in DM.
⇒ Importance of exercise in DM patients.
⇒ Learn the foot care in DM.

Pilot Study

A pilot study was conducted in the month of September at City hospital, Bangalore. An administrative approval was obtained to conduct the study. The purposes of pilot study were to:
• Evaluate the effectiveness of STP
• Find out the feasibility of conducting the final study
• Determine the methods of statistical analysis

Six diabetic patients were selected by using purposive sampling technique in September and pretest was conducted by using structured knowledge questionnaire (SKQ). On the same day STP was administered to the experimental group, a post-test was conducted after 7 days of administration of STP among experimental and control group.

The results shown that the posttest mean score of experimental group (89.2%) was higher than the control group (35%) against the pretest mean score of (44.2%) and (35.0%) of experimental and control group respectively. There was a significant increase in the knowledge level of experimental group.

Procedure for data collection

• A prior formal permission was obtained from hospitals.
• Informal permission was obtained from subjects after explaining the purpose of the study.
• A planned questionnaire was administered to assess the demographic data and pre test knowledge related to micro vascular and macro vascular complications of DM to experimental and control group.
• A structured teaching program was given to experimental group on the same day.
• Post test was conducted after 7 days to experimental and control group.
• Duration of data collection was 30 days.

Data collection schedule

See table 1, 2.

Plan of data analysis

The data obtained were analyzed in terms of objectives of the study using descriptive and inferential statistics. The plan of data analysis was as follows
• Organize data in a master sheet or computer.
• Personal data was analyzed in terms of frequencies and percentages.
• The knowledge of DM patients regarding prevention of micro and macro vascular complications of DM before and after administration of STP was analyzed in terms of frequencies, percentages, mean, median, standard deviation and presented in the form of bar/ column diagram, Pie diagram.
• Paired 't' test was used to determine the patients outcome between the experimental group and control group.
• Chi-square (χ^2) test was used to determine association between post test scores with demographic variables.

RESULTS

Hypothesis

H$_1$: There will be significant difference between the pretest and posttest

knowledge scores on prevention of micro and macro vascular complications of DM among the experimental group.

H₂: There will be significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among the control group.

H₃: there will be significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among experimental and control group.

H₄: There will be significant association between the knowledge scores on prevention of micro and macro vascular complications of DM of experimental group and control group with selected demographic variables.

Organization and Presentation of data

In order to find out the improvement in knowledge of the respondents and also to find out relationship between the variables and knowledge score, the data gathered were tabulated analyzed and interpreted using descriptive and inferential statistics. Based on the objectives and hypothesis the data are presented as here under:

Table -3: Reveals Classification of Respondents by Age, sex, marital status, education, type of diabetes mellitus, duration of illness and source of information. Majority of the respondents 10(40%) in control and 17(68%) in experimental group belongs to 31- 39 years of age group and 15(60%) in control and 8(32%) in experimental group respondents belong to 40- 49 age group.

Majority of the respondents 12(48%) in control and 18(72%) in experimental group were males and 13(52%) in control and 7(28%) in experimental group were females and majority of the respondents 2(8%) were married in both groups, 23(92%) in control and 20(80%) in experimental group were

unmarried and 3(12%) were widow(er) in experimental group.

Majority of the respondents 6(24%) in control and 10(40%) in experimental group studied upto primary school, 6(24%) in control and 4(16%) in experimental group studied upto middle school, 2(8%) in control and 3(12%) in experimental group studied upto PUC, 3(12%) each were graduates in both groups and 2(8%) in control and 4(16%) in experimental group had no formal education.

Majority of the respondents 11(44%) in control and 3(12%) in experimental group were housewives, 8(32%) in control and 9(36%) in experimental group were private employees, 5(20%) in control and 3(12%) in experimental group were government employees, 0(0%) in control and 7(28%) were farmers and rest of the respondents 0(0%) in control and 3(12%) in experimental group were businessmen.

Majority of respondents in the control group 20(80%) and 2(8%) in experimental group had NIDDM and 5(20%) in control and 23(92%) in experimental group had IDDM and 10(40%) in control, 15(60%) in experimental group had illness for about 1-2 years, 15(60%) in control and 10(40%) in control group had illness for about 3-5 years.

Majority of the respondents 16(64%) in control and 5(20%) in experimental group received information from friends/neighbors, 12(48%) in control and 3(12%) in experimental group received information from family members/relatives, 6(24%) received information from health professionals, 5(20%) in control and 8(32%) in experimental group received information from electronic mass media and 5(20%) in control and 7(28%) in experimental group received information from the print media.

Table- 4: depicts classification of respondents by religion, type of family and family income related characteristics. Majority of the respondents 22(88%) in

control and 17(68%) in experimental group belongs to Hindu religion, 2(8%) in control and 6(24%) in experimental group belongs to Muslim religion and rest of the respondents 1(4%) in control and 2(8%) in experimental group belongs to Christian religion. In that, majority of the respondents 19(76%) in control and 18(72%) belongs to nuclear family and 6(24%) in control and 7(28%) in experimental group belongs to joint family. Regarding income of the family, majority 6(24%) in control and 8(32%) in experimental group respondents monthly income was less than 5000, 12(48%) in control and 10(40%) in experimental group respondents monthly income was between5001-10,000, and 7(28%) in control and 7(28%) in experimental group respondents monthly income was more than10, 000.

Section-B: Assessment of knowledge of diabetes mellitus patients before administration of STP among experimental and control group

Table-5: depicts the Aspect wise Pre test Mean Knowledge scores of Respondents on Prevention of Micro vascular & Macro vascular complications of DM of Control group. Regarding microvascular complications of DM mean knowledge score was 20.4%, macrovascular complications of diabetes mellitus was 17.6% and in prevention of Microvascular & Macrovascular complications was 21.2%. The combined mean knowledge score was 20.1%.

Table-6: depicts aspect wise pretest knowledge scores of respondents on prevention of micro and macro vascular complications of DM in experimental group. Regarding Microvascular complications of DM mean knowledge score was 22.4%, macrovascular complications of DM was 20.8% and in prevention of Microvascular & Macrovascular complications was 19.0%. The combined mean knowledge score was 20.3%.

In the aspect of macrovascular complications of DM, the mean is 17.6% and 21.6% with an enhancement of 4.0%. The 't' value is 2.04 which is non-significant at 0.05 level.

In the aspect of Prevention of Macrovascular & Macrovascular complications, the mean is 21.2% and 24.4% with an enhancement of 3.2%. The 't' value is 2.03 which is non-significant at 0.05 level.

The combined pretest post test mean knowledge score is 20.1% and 23.3% with enhancement of 3.2% with 't' value of 2.03 which is non-significant at 0.05 level.

However, The statistical paired 't' test implies that very minimum difference in the pretest and posttest knowledge scores in various aspects found statistically non significant at 0.05 level.

Table-7: reveals aspect wise mean pretest knowledge on prevention of micro and macro vascular complications of DM of control and experimental group. In the aspect of microvascular complications the mean pretest knowledge score of control group was found to be 20.4% and of experimental group 22.4%, where as the 't' value is 0.91 which is non-significant. In the aspect of macrovascular complications the mean pretest knowledge score of control group was found to be 17.6% and of experimental group 20.8%, where as the 't' value is 1.43 which is non-significant.

In the aspect of Prevention of Microvascular & Macrovascular complications the mean pretest knowledge score of control group was found to be 21.2% and of experimental group 19.0%, where as the 't' value is 1.21 which is also non-significant. The combined mean pretest knowledge score of control and experimental group was 20.1% and 20.3% respectively and the 't' value is 0.09 which is non-significant. However, pretest scores of knowledge scores in various aspects among Control Group and

Experimental found statistically non significant at 0.05 level.

Table-8: Reveals over all Pretest Mean knowledge scores among Control and Experimental Group. Overall pretests mean knowledge scores of Control Group and Experimental was 20.1% and 20.3%. The obtained 't' value is 0.09 which is non-significant at 0.05 level.

There is no significant difference in the pre test knowledge score of patients among Control and Experimental Group.

Section-C: Effectiveness of STP with pretest and posttest scores among experimental and control group.

Table-9: Reveals Aspect wise Mean Pre test and Post test knowledge Score of control Group. In the aspect of Microvascular Complications of DM, the mean is 20.4% and 22.4% with an enhancement of 2.4%. The 't' value is 1.97 which is non-significant at 0.05 level.

In the aspect of macrovascular complications of DM, the mean is 17.6% and 21.6% with an enhancement of 4.0%. The 't' value is 2.04 which is non-significant at 0.05 level.

In the aspect of Prevention of Macrovascular & Macrovascular complications, the mean is 21.2% and 24.4% with an enhancement of 3.2%. The 't' value is 2.03 which is non-significant at 0.05 level.

The combined pretest post test mean knowledge score is 20.1% and 23.3% with enhancement of 3.2% with 't' value of 2.03 which is non-significant at 0.05 level.

However, The statistical paired 't' test implies that very minimum difference in the pretest and posttest knowledge scores in various aspects found statistically non significant at 0.05 level.

Table- 10: Reveals Over all Pre test and Posttest mean communication skill scores of the respondents in control group. The post-test mean knowledge score of respondents was 8.04 (20.1%) when compared with pre-test mean knowledge score value which was 9.32 (23.3%). The mean difference of pre-test and post test knowledge score was 1.28(3.2%).Further the statistical paired 't' test values is 2.03 which is statistically non significant at 0.05 level. Hence H_2 i.e., significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among the control group is rejected.

Table-11: Reveals Classification based on knowledge of Respondents in Control Group, in the pretest all the respondents 25(100%) had inadequate knowledge level. In the posttest also all the respondents 25(100%) had inadequate knowledge level.

However, the statistical findings depict There exists a non-significant association between knowledge scores of the respondents in pretest and posttest in control group. ($\chi^2 = 0.00$, P>0.05). Hence H_2 i.e., significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among the control group is rejected.

Table-12: Reveals Aspect wise Mean Pre test and Post test knowledge Score of experimental group. In the aspect of Microvascular Complications of DM, the mean is 22.4% and 82.4% with an enhancement of 60.0%. The 't' value is 15.31 which is significant at 0.05 level.

In the aspect of macrovascular complications of DM, the mean is 20.8% and 77.2% with an enhancement of 56.4%. The 't' value is 13.30 which is significant at 0.05 level.

In the aspect of Prevention of Macrovascular & Macrovascular complications, the mean is 19.0% and 74.4% with an enhancement of 55.4%. The 't' value is 21.98 which is significant at 0.05 level.

The combined pretest post test mean knowledge score is 20.3% and 77.1% with

enhancement of 56.8% with 't' value of 27.31 which is significant at 0.05 level.

However, The statistical paired 't' test implies that the difference in the pretest and posttest knowledge scores in various aspects found statistically significant at 0.05 level.

Table-13: Reveals regarding Over all Pre test and Posttest mean knowledge scores of the respondents in Experimental Group, the post-test mean knowledge score of respondents was higher 30.84 (77.1%) when compared with pre-test mean knowledge score value which was 8.12 (20.3%). The mean difference of pre-test and post test knowledge score was 22.72(56.8%).

Further the statistical paired 't' test value was 27.31, which is statistically significant at 0.05 level. Hence H_1 i.e., significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among the experimental group is accepted.

Table-14: Reveals Classification based on knowledge level of Respondents in experimental Group, in the pretest all the respondents 25 (100%) had inadequate knowledge level. In the posttest, 15(60%) of the respondents had adequate level of knowledge score and 10 (40%) had moderate knowledge level.

Further the statistical χ^2 value is 50.00, which is significant at 5% level. There exists a significant difference between knowledge scores of the respondents in pretest and posttest in experimental group. Hence H_1 i.e., significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among the experimental group is accepted.

Table -15: Reveals Aspect wise Mean Post test Score of knowledge among Control Experimental group. In the aspect of Microvascular Complications of DM, the mean is 22.8% and 82.4%. The student 't' value is 18.65.

In the aspect of Macrovascular Complications of DM, the mean is 21.6% and 77.2%. The student 't' value is 15.77.

In the aspect of Prevention of Microvascular & Macrovascular complications, the mean is 24.4% and 74.4%. The student 't' value is 18.40.

The combined mean is 23.3% and 77.1% and the student 't' value is 26.52.

However, posttest scores of knowledge scores in various aspects among Control and Experimental Group found statistically significant at 0.05 levels.

Table-16: Reveals overall Posttest Mean knowledge scores among Control and Experimental Group. Overall pretests mean knowledge scores of Control Group and Experimental was 23.3% and 77.1%. The obtained 't' value is 26.52 which is significant at 0.05 levels. Hence H_3 i.e., significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of diabetes mellitus among experimental and control group is accepted.

Section-D: Association between pretest & post test knowledge score and Demographic Variables among DM patients

This section deals with association of selected demographic variables with knowledge score of diabetes mellitus patients. Chi –square (χ^2) was computed to find out the association.

Data presented in the table-17: indicates, a significant association between selected demographic variables such as age group, type of family, family income, duration of illness, hence H_4 i.e., significant association between the knowledge scores on prevention of micro and macro vascular complications of diabetes mellitus of experimental group and control group with selected demographic variables is accepted.

There exists a non-significant association between selected demographic variables such as sex, marital status, religion, educational status, occupation and type of diabetes mellitus, **H₄** i.e., significant association between the knowledge scores on prevention of micro and macro vascular complications of diabetes mellitus of experimental group and control group with selected demographic variables is rejected.

DISCUSSION

The major findings of the study were discussed under the objectives and hypothesis.

Section A: Description of Demographic variables (Sample characteristics)

- Majority of the respondents 15(60%) in control group belongs to 40- 49 years of age group and 17(68%) of respondents in experimental group belongs to 31-39 years of age.
- Majority of the respondents 13(52%) in control group were females and 18(72%) of respondents in experimental group were males.
- Majority of the respondents 23(92%) in control group and 20(80%) in experimental group were married.
- Majority of the respondents 6(24%) in control group had education till primary and middle school and 10(40%) in experimental group had education till primary school.
- Majority of the respondents 11(44%) in the control group were housewives and 9(36%) in experimental group were private employees.
- Majority of respondents 20(80%) in control group had NIDDM and 23(92%) in experimental group had IDDM.
- Regarding duration of illness, 15(60%) of the respondents in control group had illness for past 3-5 years and 15(60%) in the experimental group had illness for past 1-2 years.
- Majority of the respondents 16(64%) in the control group received information from friends/neighbors and 8(32%) in experimental group received from electronic mass media.
- Majority of the respondents 22(88%) in the control group and 17(68%) in the experimental group also belongs to Hindu religion.
- Majority of the respondents 19(76%) in the control group and 18(72%) in experimental group belongs to nuclear family.
- Majority of the respondents 12(48%) in control group monthly income was between 5001-10,000 and 10(40%) respondents in experimental group monthly income was 5001-10,000.

Section B: Assessment of knowledge of DM patients before administration of STP among experimental and control group.

Objective I: To assess the knowledge of patient regarding prevention of micro vascular and macro vascular complications in DM in the pre test among experimental and control group.

- Aspect wise Pre test Mean Knowledge scores of Respondents on Prevention of Micro vascular & Macro vascular complications of DM in Control group.
    Aspect wise Pre test Mean Knowledge scores of Respondents on Prevention of Micro vascular & Macro vascular complications of DM of Control group. Regarding microvascular complications of diabetes mellitus mean knowledge score was 20.4%, macrovascular complications of DM was 17.6% and in prevention of Microvascular & Macrovascular complications was 21.2%. The combined mean knowledge score was 20.1%.

- Aspect wise Pre test Mean Knowledge scores of Respondents on Prevention of Micro vascular & Macro vascular complications of DM in Experimental group.

  Aspect wise pretest knowledge scores of respondents on prevention of micro and macro vascular complications of DM in experimental group. Regarding Microvascular complications of DM mean knowledge score was 22.4%, macrovascular complications of DM was 20.8% and in prevention of Microvascular & Macrovascular complications was 19.0%. The combined mean knowledge score was 20.3%.

- Aspect wise Mean Pre test Knowledge on Prevention of Micro vascular & Macro vascular complications of DM.

  Aspect wise mean pretest knowledge on prevention of micro and macro vascular complications of DM of control and experimental group. In the aspect of microvascular complications the mean pretest knowledge score of control group was found to be 20.4% and of experimental group 22.4%, where as the 't' value is 0.91 which is non-significant.

  In the aspect of macrovascular complications the mean pretest knowledge score of control group was found to be 17.6% and of experimental group 20.8%, where as the 't' value is 1.43 which is non-significant. In the aspect of Prevention of Microvascular & Macrovascular complications the mean pretest knowledge score of control group was found to be 21.2% and of experimental group 19.0%, where as the 't' value is 1.21 which is also non-significant . The combined mean pretest knowledge score of control and experimental group was 20.1% and 20.3% respectively and the 't' value is 0.09 which is non-significant. However, pretest scores of knowledge scores in various aspects among Control Group and Experimental found statistically non significant at 0.05 level.

- Overall Mean Pre test Knowledge on Prevention of Micro vascular & Macro vascular complications of DM of control and experimental group.

  Overall pretests mean knowledge scores of Control Group and Experimental group was 20.1% and 20.3%. The obtained 't' value is 0.09 which is non-significant at 0.05 levels.

  Hence, there is no significant difference in the pre test knowledge score of patients among Control and Experimental Group.

  The above finding shows that knowledge on prevention of micro and macro vascular complications in DM is inadequate and these findings are supported by the following study.

  A study was conducted on knowledge of diabetes, its treatment and complications amongst diabetic patients in a tertiary care hospital shown that increasing patient knowledge regarding disease and its complications has significant benefits with regard to patient compliance to treatment and to decrease complications associated with the disease. Of the 101 samples, patients' knowledge regarding the treatment and complications of diabetes showed serious deficiencies more so among women, even though most had been diabetic for years. In this present study, only 57.4% of the patients know that feet are affected in diabetes, 64.4% knew that diabetes affects the heart, and only 26.7% of the patients knew that kidneys are affected. The present study concluded that the patients' knowledge about the treatment and complications of diabetes is limited especially with regards to preventive aspect[8].

Section-C: Effectiveness of STP with pretest and posttest scores among experimental and control group.

Objective –II: To evaluate the effectiveness of structured teaching program on prevention of

micro vascular and macro vascular complications of diabetes mellitus with pre test and post test score in experimental group and control group.

- Aspect wise Mean Pre test and Post test Knowledge on Prevention of Micro vascular & Macro vascular complications of DM in Control group.

Aspect wise Mean Pre test and Post test knowledge Score of control Group. In the aspect of Microvascular Complications of DM, the mean is 20.4% and 22.4% with an enhancement of 2.4%. The 't' value is 1.97 which is non-significant at 0.05 level.

In the aspect of macrovascular complications of DM, the mean is 17.6% and 21.6% with an enhancement of 4.0%. The 't' value is 2.04 which is non-significant at 0.05 level.

In the aspect of Prevention of Macrovascular & Macrovascular complications, the mean is 21.2% and 24.4% with an enhancement of 3.2%. The 't' value is 2.03 which is non-significant at 0.05 level.

The combined pretest post test mean knowledge score is 20.1% and 23.3% with enhancement of 3.2% with 't' value of 2.03 which is non-significant at 0.05 level. However, The statistical Paired 't' test implies that very minimum difference in the pretest and posttest knowledge scores in various aspects found statistically non significant at 0.05 level.

- Over all Pre test and Post test Mean Knowledge on Prevention of Micro vascular & Macro vascular complications of DM in Control group

Over all Pre test and Posttest mean knowledge scores of the respondents in control group. The post-test mean knowledge score of respondents was 8.04 (20.1%) when compared with pre-test mean knowledge score value which was 9.32 (23.3%). The mean difference of pre-test and post test knowledge score was 1.28(3.2%).Further the

statistical Paired 't' test values is 2.03 which is statistically non significant at 0.05 level.

Hence H_2 i.e., significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among the control group is rejected.

- Pre test & Post test Knowledge level on Prevention of Micro vascular & Macro vascular complications of DM in Control group

In the pretest all the respondents 25 (100%) had inadequate knowledge level. In the posttest also all the respondents 25(100%) had inadequate knowledge level. However, the statistical findings depict There exists a non-significant association between knowledge scores of the respondents in pretest and posttest in control group. (χ^2 = 0.00, P>0.05).

- Aspect wise Mean Pre test and Post test Knowledge on Prevention of Micro vascular & Macro vascular complications of DM in Experimental group

Aspect wise Mean Pre test and Post test knowledge Score of experimental group. In the aspect of Microvascular Complications of DM, the mean is 22.4% and 82.4% with an enhancement of 60.0%. The 't' value is 15.31 which is significant at 0.05 level.

In the aspect of macrovascular complications of DM, the mean is 20.8% and 77.2% with an enhancement of 56.4%. The 't' value is 13.30 which is significant at 0.05 level. In the aspect of Prevention of Macrovascular & Macrovascular complications, the mean is 19.0% and 74.4% with an enhancement of 55.4%. The 't' value is 21.98 which is significant at 0.05 level.

The combined pretest post test mean knowledge score is 20.3% and 77.1% with enhancement of 56.8% with 't' value of 27.31 which is significant at 0.05 level. However, The statistical Paired 't' test implies that the difference in the pretest and posttest

knowledge scores in various aspects found statistically significant at 0.05 level.

- Over all Pre test and Post test Mean Knowledge on Prevention of Micro vascular & Macro vascular complications of DM in Experimental group.

Over all Pre test and Posttest mean knowledge scores of the respondents in Experimental Group, the post-test mean knowledge score of respondents was higher 30.84 (77.1%) when compared with pre-test mean knowledge score value which was 8.12 (20.3%). The mean difference of pre-test and post test knowledge score was 22.72(56.8%). Further the statistical Paired 't' test value was 27.31, which is statistically significant at 0.05 levels. Hence H_1 i.e., significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among the experimental group is accepted.

- Pre test & Post test Knowledge level on Prevention of Micro vascular & Macro vascular complications of DM in Experimental group

In the pretest all the respondents 25 (100%) had inadequate knowledge level. In the posttest, 15(60%) of the respondents had adequate level of knowledge score and 10 (40%) had moderate knowledge level. Further the statistical χ^2 value is 50.00, which is significant at 5% level. There exists a significant difference between knowledge scores of the respondents in pretest and posttest in experimental group, hence H_1 i.e., there is a significant difference between the pre test and post test knowledge scores among experimental group is accepted.

The above findings is supported by a randomized prospective study conducted on teaching of patient to monitor the risk factors and retard the progress of vascular complications in high risk patients with type II DM. The aim of the study was to examine whether therapeutic responsibility with the patient will improve the outcome, A 165

patients with type II DM, hypertension and hyperlipidemia were randomly allocated to standard annual consultation. Physicians administered the medical care for both groups. The study shown that, well informed and motivated patients were more insistent and maintain target values of the main risk factors of diabetic complications[9].

- Aspect wise Mean Post test Knowledge on Prevention of Micro vascular & Macro vascular complications of DM.

Aspect wise Mean Post test Score of knowledge among Control and Experimental group. In the aspect of Microvascular Complications of DM, the mean is 22.8% and 82.4%. The student 't' value is 18.65. In the aspect of Macrovascular Complications of DM, the mean is 21.6% and 77.2%. The student 't' value is 15.77. In the aspect of Prevention of Microvascular & Macrovascular complications, the mean is 24.4% and 74.4%. The student 't' value is 18.40. The combined mean is 23.3% and 77.1% and the student 't' value is 26.52. However, posttest scores of knowledge scores in various aspects among Control and Experimental Group found statistically significant at 0.05 levels.

- Overall Mean Post test Knowledge on Prevention of Micro vascular & Macro vascular complications of DM.

Overall pretests mean knowledge scores of Control and Experimental Group was 23.3% and 77.1%. The obtained 't' value is 26.52 which is significant at 0.05 level.

Hence H_3 i.e., significant difference between the pretest and posttest knowledge scores on prevention of micro and macro vascular complications of DM among experimental and control group is accepted.

The above findings are supported by a study conducted to assess the improving Foot Self-Care Behaviors with Pies Sanos. Participants who received *Pies Sanos*, a 15-min intervention designed to improve diabetes self-efficacy and foot self-care behaviors in

adult patients with type 2 diabetes, performed more-complete foot self-care 1 month later in their homes. Participants were randomized into one of three groups. The result showed that at follow-up, there was a significant difference in observed foot self-care behaviors between groups, $F(2, 135) = 2.99$, $p < .05$, as well as a significant difference within the intervention, $t(47) = -4.32$, $p < .01$, and control group, $t(46) = -2.06$, $p < .05$, for baseline and follow-up self-reported foot self-care behaviors[54].

Section-D: Association between pretest & post test knowledge score and Demographic Variables among DM patients.

Objective III: To explore association between knowledge scores on prevention of micro vascular and macro vascular complications of DM with selected demographic variables.

- Association between Demographic variables and Post test Knowledge level on Prevention of Micro vascular & Macro vascular complications of DM in Experimental group.

A significant association exists between selected demographic variables such as age group, type of family, family income, duration of illness, hence H_4 i.e., significant association between the knowledge scores on prevention of micro and macro vascular complications of DM of experimental group and control group with selected demographic variables is accepted.

There exists a non-significant association between selected demographic variables such as sex, marital status, religion, educational status, occupation and type of DM hence, H_4 is rejected.

The above finding is supported by following study.

A multicentre case-control study was conducted to identify and quantify risk factors that may influence the development and progression of diabetic retinopathy. A total of 200 diabetic patients with non-proliferative retinopathy were compared with 400 diabetic patients without any eye complications with regard to the development of diabetic retinopathy. They were also compared with 200 diabetic patients with major eye complications to study the progression of diabetic eye complications. Results showed that the progression of diabetic eye complications was preventable since the variables age, duration of illness, and income significantly affecting the process of progression, except type of diabetes, were avoidable[10].

CONCLUSION

Based on the findings the result of the study shows that the pretest knowledge of the DM patients of the experimental group was 20.3% and 20.1% in control group which indicates that the patients of both the experimental and control group had inadequate knowledge regarding micro and macro vascular complications of DM.

In the posttest the knowledge of the DM patients of the experimental group was 77.1% in which there is a significant difference of 56.8% which is a net benefit to the patients of experimental group due to the effectiveness of structured teaching programme and the post test knowledge of control group was 23.3% in which there is a less difference of 3.2% shows inadequate knowledge in the posttest also.

Implication

The present study enabled the DM patients to gain knowledge on prevention of micro and macro vascular complications. The study also helped the patients to improve quality of life and decrease the economic burden.

The findings of the study have implications for nursing practice, nursing education, nursing administration and nursing research.

Implication for nursing practice

The expanded role of the professional nurse emphasizes those activities, which promotes health and preventive behavior among the people. In hospital setups nurses plays an important role.

- Nurses can plan educational sessions on prevention of diabetic complications by which number of readmission to the hospital can be significantly reduced.
- Nurses working at out-patient department must try to spend some time with diabetic patients by which teaching and training programmes can be conducted on deficient areas such as diet, self care activities (foot and nail care), exercises and medications.

Implication for nursing education

- Findings of the study have implications for nursing education too. Nurse educators should use different teaching strategies to educate student nurses in enhancing knowledge and skills in theory as well as practice.
- Nurses at the post graduate level need to develop skills in preparing Health teaching materials in various specialized areas at the level of patients understanding.

Implication for nursing research

- One of the aims of nursing research is to contribute the knowledge to the body of nursing, to expand and broaden the scope of nursing. This is possible only if nurses take initiative to conduct the further research.
- The research helps to plan new interventional strategies for the DM patients to prevent the long term complications.
- Research has the character of dependency. To do this study, knowledge is accumulated from many researches. This material and adopted methodologies will be a useful guide to the nursing researchers to find the right information from the target groups to shape up the truth.

Implication for nursing administration

The present study has proven effectiveness of teaching programme in enhancing the knowledge of diabetic patients regarding prevention of vascular complications. So the nurse administrator can take initiative to provide facilities to conduct such educational programmes in the hospital.

The nurse administrator at various levels of health care delivery system should focus their attention to make the public conscious about the prevention of vascular complications. Administrator should organize in service education programmes, refresher courses and workshop for nurses and encourage them to participate in these activities.

Limitations

The limitations of the present study were:

1. Effectiveness of teaching programme is measured in terms of knowledge aspects only.

Post test was conducted only for the respondents those who were available at the time of administration of posttest.

Recommendations

Keeping in view the findings of the present study the following recommendations are made. Since this study was carried out on a small sample, the results can be used only as a guide for further studies.

1. The study may be replicated by taking a larger sample.
2. A similar study may be conducted with different teaching strategies such as video assisted teaching.
3. A similar study can be conducted with demonstration.

A similar study can be conducted on knowledge and practice aspects.

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Table 1. Schedule of Data collection for Control group

No. of DM Patients	Pretest	Posttest
2	1st Day	7th Day
2	3rdDay	9th Day
1	5th Day	11th Day
3	7th Day	13th Day
4	9th Day	15th Day
2	11th Day	17th Day
3	13th Day	19th Day
3	15th Day	21st Day
2	17th Day	23rd Day
3	19th Day	25th Day

Table 2. Schedule of Data collection schedule for Experimental group

No. of DM Patients	Pretest	STP	Posttest
1	2nd Day	2nd Day	8th Day
3	4th Day	4th Day	10th Day
2	6th Day	6th Day	12th Day
4	8th Day	8th Day	14th Day
2	10th Day	10th Day	16th Day
3	12th Day	12th Day	18th Day
2	14th Day	14th Day	20th Day
2	16th Day	16th Day	22nd Day
3	18th Day	18th Day	24th Day
3	20th Day	20th Day	26th Day

Table 3. Classification of Respondents by Personal Characteristics

(N=50)

Characteristics	Category	Respondents					
		Control (n=25)		Experimental (n=25)		Combined (n=50)	
		N	%	N	%	N	%
Age group (years)	31-39	10	40.0	17	68.0	27	54.0
	40-49	15	60.0	8	32.0	23	46.0
Sex	Male	12	48.0	18	72.0	30	60.0
	Female	13	52.0	7	28.0	20	40.0
Marital status	Unmarried	2	8.0	2	8.0	4	8.0
	Married	23	92.0	20	80.0	43	86.0
	Widow(er)	0	0.0	3	12.0	3	6.0
Educational status	Primary	6	24.0	10	40.0	16	32.0
	Middle	6	24.0	4	16.0	10	20.0
	Secondary	5	20.0	2	8.0	6	14.0
	PUC	5	8.0	5	20.0	5	20.0
	Graduate	3	12.0	4	16.0	6	14.0
Occupation	Government	5	20.0	3	12.0	8	16.0
	Private	8	32.0	9	36.0	17	34.0
	Business	0	0.0	3	12.0	3	6.0
	House wife	12	48.0	3	12.0	15	30.0
	Agriculture	0	0.0	7	28.0	7	14.0
Type of Diabetes mellitus	IDDM	5	20.0	23	92.0	28	56.0
	NIDDM	20	80.0	2	8.0	22	44.0
Duration of Illness	1 – 2 years	10	40.0	15	60.0	25	50.0
	3 - 5 years	15	60.0	10	40.0	25	50.0
Source of information @	TV/Radio/Internet	5	20.0	8	32.0	13	26.0
	Print media	5	20.0	7	28.0	5	10.0
	Health Professional	6	24.0	2	8.0	8	16.0
	Family members/Relatives	12	48.0	3	12.0	15	30.0
	Friends/Neighbors	16	64.0	5	20.0	21	42.0

Table 4. Classification of Respondents by Family related Characteristics

(N=50)

Characteristics	Category	Respondents					
		Control (n=25)		Experimental (n=25)		Combined (n=50)	
		N	%	N	%	N	%
Religion	Hindu	22	88.0	17	68.0	39	78.0
	Muslim	2	8.0	6	24.0	8	16.0
	Christian	1	4.0	2	8.0	3	6.0
Type of family	Nuclear	19	76.0	18	72.0	37	74.0
	Joint	6	24.0	7	28.0	13	26.0
Family Income/month	< Rs.5,000	6	24.0	8	32.0	14	28.0
	Rs.5,001-10,000	12	48.0	10	40.0	22	44.0
	> Rs.10,000	7	28.0	7	28.0	14	28.0

Table 5. Aspect wise Pre test Mean Knowledge scores of Respondents on Prevention of Micro vascular & Macro vascular complications -Control group

(N=25)

No.	Knowledge Aspects	Statements	Max. Score	Respondents Knowledge		
				Mean	Mean(%)	SD(%)
I	Microvascular Complications	10	10	2.04	20.4	7.9
II	Macrovascular complications	10	10	1.76	17.6	7.8
III	Prevention of Microvascular & Macrovascular complications	20	20	4.24	21.2	9.2
	Combined	40	40	8.04	20.1	7.2

Table 6. Aspect wise Pre test Mean Knowledge scores of Respondents on Prevention of Micro vascular & Macro vascular complications -Experimental group

(N=25)

No.	Knowledge Aspects	Statements	Max. Score	Respondents Knowledge		
				Mean	Mean(%)	SD(%)
I	Microvascular Complications	10	10	2.24	22.4	13.3
II	Macrovascular complications	10	10	2.08	20.8	13.8
III	Prevention of Macrovascular & Macrovascular complications	20	20	3.80	19.0	9.0
	Combined	40	40	8.12	20.3	8.9

Table 7. Aspect wise Mean Pre test Knowledge on Prevention of Micro vascular & Macro vascular complications

No.	Knowledge Aspects	Respondents Knowledge (%)				Student 't' Test
		Control (n = 25)		Experimental (n = 25)		
		Mean	SD	Mean	SD	
	Microvascular Complications	20.4	7.9	22.4	13.3	0.91 NS
II	Macrovascular complications	17.6	7.8	20.8	13.8	1.43 NS
III	Prevention of Microvascular & Macrovascular complications	21.2	9.2	19.0	9.0	1.21 NS
	Combined	20.1	7.2	20.3	8.9	0.09 NS

Table 8. Overall Mean Pre test Knowledge on Prevention of Micro vascular & Macro vascular complications of control and experimental group

Aspects	Respondents Knowledge (%)				Student 't' Test
	Control (n = 25)		Experimental (n = 25)		
	Mean	SD	Mean	SD	
Pre test	20.1	7.2	20.3	8.9	0.09 NS

Table 9. Aspect wise mean pre test and Post test Knowledge on Prevention of Micro vascular & Macro vascular complications -Control group

(N = 25)

No.	Knowledge Aspects	Respondents Knowledge (%)						Paired 't' Test
		Pre test		Post test		Enhancement		
		Mean	SD	Mean	SD	Mean	SD	
I	Microvascular Complications	20.4	7.9	22.8	10.2	2.4	6.1	1.97 NS
II	Macrovascular complications	17.6	7.8	21.6	10.3	4.0	9.8	2.04 NS
III	Prevention of Macro & Macrovascular complications	21.2	9.2	24.4	8.5	3.2	7.9	2.03 NS
	Combined	20.1	7.2	23.3	7.7	3.2	7.9	2.03 NS

Table 10. Over all Pre test and Post test Mean Knowledge on Prevention of Micro vascular & Macro vascular complications -Control group

(N=25)

Aspects	Max. Score	Respondents Knowledge			Paired 't' Test
		Mean	Mean (%)	SD (%)	
Pre test	40	8.04	20.1	7.2	
Post test	40	9.32	23.3	7.7	2.03 NS
Enhancement	40	1.28	3.2	7.9	

Table 11. Pre test & Post test Knowledge level on Prevention of Micro vascular & Macro vascular complications-Control group

Knowledge Level	Category	Classification of Respondents			
		Pre test		Post test	
		Number	Percent	Number	Percent
Inadequate	< 50% Score	25	100.0	25	100.0
Moderate	51-75 % Score	0	0.0	0	0.0
Adequate	> 75 % Score	0	0.0	0	0.0
Total		25	100.0	25	100.0
χ^2 Value		0.00 NS			

Table 12. Aspect wise Mean Pre test and Post test Knowledge on Prevention of Micro vascular & Macro vascular complications -Experimental group

(N=25)

No.	Knowledge Aspects	Respondents Knowledge (%)						Paired 't' Test
		Pre test		Post test		Enhancement		
		Mean	SD	Mean	SD	Mean	SD	
I	Microvascular Complications	22.4	13.3	82.4	12.3	60.0	19.6	15.31*
II	Macrovascular complications	20.8	13.8	77.2	14.3	56.4	21.2	13.30*
III	Prevention of Micro & Macrovascular complications	19.0	9.0	74.4	10.6	55.4	12.6	21.98*
	Combined	20.3	8.9	77.1	6.6	56.8	10.4	27.31*

Table 13. Over all Pre test and Post test Mean Knowledge on Prevention of Micro vascular & Macro vascular complications -Experimental group

(N=25)

Aspects	Max. Score	Respondents Knowledge			Paired 't' Test
		Mean	Mean (%)	SD (%)	
Pre test	40	8.12	20.3	8.9	
Post test	40	30.84	77.1	6.6	27.31*
Enhancement	40	22.72	56.8	10.4	

Table 14. Pre test & Post test Knowledge level on Prevention of Micro vascular & Macro vascular complications - Experimental group

Knowledge Level	Category	Classification of Respondents			
		Pre test		Post test	
		Number	Percent	Number	Percent
Inadequate	< 50 %	25	100.0	0	0.0
Moderate	51-75 %	0	0.0	10	40.0
Adequate	> 75 %	0	0.0	15	60.0
Total		25	100.0	25	100.0
χ^2 Value		50.00 *			

Table 15. Aspect wise Mean Post test Knowledge on Prevention of Micro vascular & Macro vascular complications

a	Knowledge Aspects	Respondents Knowledge (%)				Student 't' Test
		Control (n = 25)		Experimental (n = 25)		
		Mean	SD	Mean	SD	
I	Microvascular Complications	22.8	10.2	82.4	12.3	18.65*
II	Macrovascular complications	21.6	10.3	77.2	14.3	15.77*
III	Prevention of Microvascular & Macrovascular complications	24.4	8.5	74.4	10.6	18.40*
	Combined	23.3	7.7	77.1	6.6	26.52*

Table 16. Overall Mean Post test Knowledge on Prevention of Micro vascular & Macro vascular complications of Control and Experimental group

Aspects	Respondents Knowledge (%)				Student 't' Test
	Control (n = 25)		Experimental (n = 25)		
	Mean	SD	Mean	SD	
Post test	23.3	7.7	77.1	6.6	26.52*

Table 17. Association between Demographic variables and Post test Knowledge level on Prevention of Micro vascular & Macro vascular complications -Experimental group (N=25)

Demographic Variables	Category	Sample	Respondents Knowledge				χ² value	P Value
			Moderate		Adequate			
			N	%	N	%		
Age Group (years)	31-39	17	4	23.5	13	76.5	6.01*	< 0.05
	40-49	8	6	75.0	2	25.0		
Sex	Male	18	7	38.9	11	61.1	0.03 NS	> 0.05
	Female	7	3	42.9	4	57.1		
Marital Status	Unmarried	2	1	50.0	1	50.0	0.14 NS	> 0.05
	Married	20	8	40.0	12	60.0		
	Widow (er)	3	1	33.3	2	66.7		
Religion	Hindu	17	5	29.4	12	70.6	2.66 NS	> 0.05
	Muslim	6	4	66.7	2	33.3		
	Christian	2	1	50.0	1	50.0		
Type of family	Nuclear	18	5	27.8	13	72.2	4.00*	< 0.05
	Joint	7	5	71.4	2	28.6		
Educational Status	Primary	10	2	20.0	8	80.0	5.49 NS	> 0.05
	Middle	4	3	75.0	1	25.0		
	Secondary	2	2	100	0	0.0		
	PUC	5	2	20.0	3	60.0		
	Graduate	4	1	25.5	3	75.0		
Occupation	Government	3	1	33.3	2	66.7	3.84 NS	> 0.05
	Private	9	4	44.4	5	55.6		
	Business	3	2	66.7	1	33.3		
	House wife	3	2	66.7	1	33.3		
	Agriculture	7	1	14.3	6	85.7		
Family Income/month	< Rs.5,000	8	0	0.0	8	100	8.63*	< 0.05
	Rs.5,001-10,000	10	5	50.0	5	50.0		
	> Rs.10,000	7	5	71.4	2	28.6		
Type of diabetes Mellitus	IDDM	23	9	39.1	14	60.9	0.09 NS	> 0.05
	NIDDM	2	1	50.0	1	50.0		
Duration of illness	1-2 years	15	9	60.0	6	40.0		
	3-5 years	10	1	10.0	9	90.0	6.25*	< 0.05
Total		25	10	40.0	15	60.0		

Research	Research design	Setting	Population	Sampling
A study to assess the effectiveness of STP on prevention of micro and macro vascular complications	Quasi - experimental Design	KCG and ESI hospitals, Bangalore.	**Target population**: Diabetes mellitus patients **Accessible population:** Diabetes mellitus patients without	Purposive sampling technique

Collection of data

Sample size

Experimental Group -25

Group -25

Experimental

Control group

Pre Test (Structured

Post Test (Structured Knowl

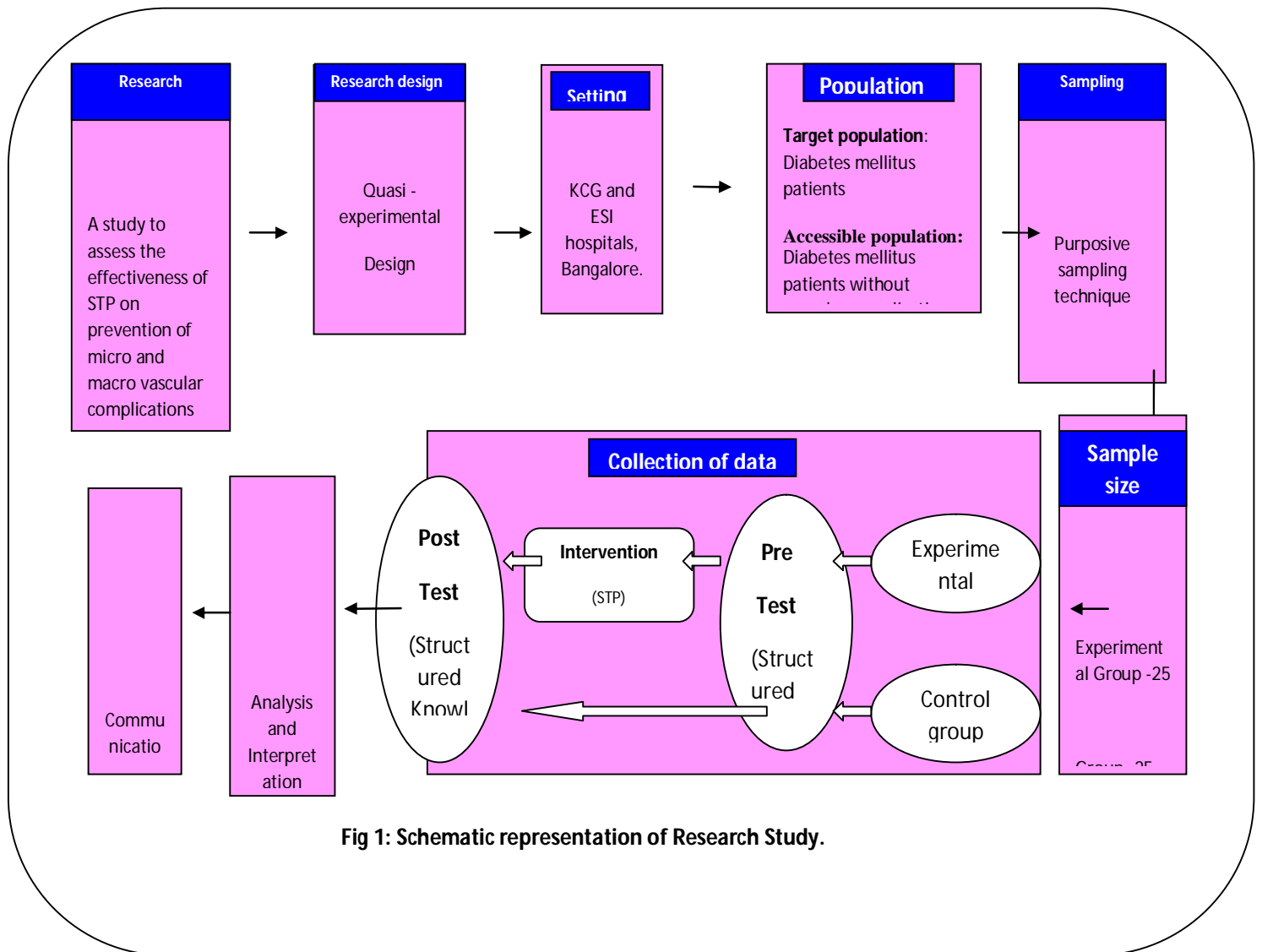Intervention (STP)

Analysis and Interpretation

Commu nicatio

Fig 1: Schematic representation of Research Study.