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A Study to Evaluate the Effectiveness of Selected Nursing Interventions on Knowledge and Practice on Self-Care Management among Diabetic Patients in Selected PHCs Puducherry



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ABSTRACT

Background: Diabetes mellitus is one of the global health burdens associated with inadequate self-care management. Self-care management is a pivot of diabetes management. The study aimed to evaluate the effectiveness of selected nursing interventions on knowledge and Practice of self-care management among diabetic patients in selected PHCs Puducherry, with the objectives of assessing the Pretest and post-test level of knowledge and Practice of self-care management among diabetic patients in an experimental and control group, to evaluate the effectiveness of selected nursing interventions on self-care management among diabetic patients in the experimental group and compare with the control group, to correlate the Post-test level of Knowledge with Practice on Self-Care Management of Diabetes mellitus in both experimental and control group and to associate the posttest level of knowledge and practice on self-care management among diabetic patients with their selected demographic & clinical variables in the experimental group. **Methodology:** The study setting was two selected PHCs (Kirumampakkam and Bahour) in Puducherry. The sample size was (65 in the Experimental group and 65 in the Control group) which was selected by adopting the purposive sampling technique. A pretest was done to assess the level of knowledge and practice on self-care management in the experimental and control group with the help of a structured questionnaire with an interview schedule. **Results:** The study results revealed that the level of knowledge on self-care management, 46(70.77%) diabetic patients had adequate knowledge, and 65(100%) diabetic patients had a good practice in self-care management in the experimental group. Whereas in the control group post-test illustrated the level of knowledge on self-care management, 33(50.77%) diabetic patients had moderate knowledge and 57(87.69%) had moderate practice on self-care management. **Conclusion:** The study concluded that selected nursing interventions were very effective in improving knowledge and practice about self-care management among diabetic patients in the experimental group when compared to the control group.

INTRODUCTION

Noncommunicable diseases (NCDs) are one of the major problems and challenges for public health in the 21st century, not only in terms of the suffering humans cause but also in the harm they inflict on the socio-economic developments of the country. Noncommunicable diseases kill 41 million people each year, equivalent to 71% of all deaths worldwide. Every year, 15 million people died from Non-communicable diseases between the ages of 30 and 69 years; over 85% of these "premature" deaths occurred in very low- and middle-income countries. The majority of premature Non-communicable diseases deaths are preventable.¹

According to World Health Organization (WHO) Projections, the total annual number of deaths from Non-communicable diseases will increase to 55 million by 2030, if timely interventions are not done for the prevention and control of Non-communicable diseases (NCDs).²

The leading causes of Non-communicable diseases (NCDs) mortality in 2016 were diabetes, cardiovascular diseases, chronic respiratory diseases, cancers, and, blood, urogenital and endocrine diseases. Findings from the India state-level Disease Burden Initiative reveal the dramatic increases in disability-adjusted life year rates between 1990 and 2016 for two specific Non-communicable diseases (NCDs) – Diabetes and ischemic heart disease.³

Diabetes mellitus is a common non-communicable disease (NCDs) in India, as well as globally. It has emerged as a major public health problem and very low- and middle-income countries facing the greatest burden.⁴

Diabetes mellitus is a very important and growing Major health problem in both developed and developing countries as it requires lifelong medical and lifestyle Modifications.⁵

The global diabetes prevalence in the year 2019 is estimated that about 9.3% (463 million people), rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045. The prevalence is higher in urban (10.8%) than the rural (7.2%) areas, and in high-income (10.4%) than the low-income countries (4.0%). One in two (50.1%) people living with diabetes do not know that they have diabetes. The global prevalence of impaired glucose tolerance is estimated to be 7.5% (374 million) in the 2019 and projected to reach 8.0% (454 million) by 2030 and 8.6% (548 million) by 2045.⁶

According to a WHO report in 2020, India had the second rank in the list of diabetes among people aged between 20–79 years next only to China. India had 77 million diabetic people aged between 20–79 years, while China had 116.4 million people.⁷

The prevalence of the disease is increasing globally and leads to the development of chronic complications. It has been recognized for years that the complications may be disabling or eventually life-threatening negatively affects the quality of life in individuals with diabetes mellitus. Especially, the complications of diabetes mellitus are classified as either primary complications such as hypoglycemia, diabetic ketoacidosis (DKA) and secondary complications such as neuropathy, nephropathy, and retinopathy.⁸

Managing Diabetes mellitus and its complications is very costly. Many studies have shown that control of high blood glucose in diabetic patients can prevent or reduce the risks of diabetic complications. 17 Better glycaemic management of diabetes mellitus requires not only the prescription of the appropriate nutritional and pharmacological regime by the medical officers but also intensive education of the patient.⁹

Patient knowledge regarding disease and self-care practices are found to be very important for patients to achieve the desired treatment targets and contribute meaningfully in the management of their disease and its complications.¹⁰

Self-care knowledge and practice is the key to the development of the patient is independence and self-esteem. Diabetic patients must perform a complex set of self-care practices, to maintain their blood glucose level in a normal range, including self-insulin administration, self-monitoring of blood glucose and following a good and healthy diet, however, diabetes self-care management is demanding and requires much effort, skill and knowledge, the diabetes educational teaching and training helps to develop skill, and ability necessary for diabetes self-care.¹¹

Diabetic self-care management education is the process of providing adequate knowledge and skill to perform the self-care practices on a day-to-day basis for the person with diabetes mellitus, self-care management education, teaches the relationship among medical, nutrition therapy, physical activity level, emotional, physical status on medications, then respond appropriately continually to those factors to achieve and, maintain the optimum glucose level in control.¹²

Objectives of the study:

1. To assess the pretest and post-test level of knowledge and practice on self-care management among Diabetic patients in the experimental and control group.
2. To evaluate the Effectiveness of Selected Nursing Interventions on self-care management among Diabetic Patients in the experimental group and compare with the control group.
3. To correlate the post-test level of knowledge with practice on self-Care Management of Diabetes mellitus in both experimental and control group.
4. To associate the post-test level of knowledge and practice on self-care management among Diabetic patients with their selected demographic & clinical variables in experimental group.

MATERIALS AND METHODS:

The research approach and design selected for this study were quantitative approaches and quasi-experimental pretest and Posttest with control group design respectively. The study setting was two selected PHCs (Kirumampakkam and Bahour) in Puducherry. The sample size was (65 in the Experimental group and 65 in Control group) which was selected by adopting the purposive sampling technique. A pretest was done to assess the level of knowledge and practice on self-care management in an experimental and control group with the help of structure questionnaire with an interview schedule. Patients in the experimental group received video-assisted teaching and a booklet whereas the patients in the control group received only routine hospital care. Posttest was done on the 7th day using the same tool.

Data analysis

Descriptive statistics like frequency and percentage were used for demographic and clinical variables, level of knowledge and Practice. Mean and standard deviation was used for mean pre and post-test knowledge and Practice. Inferential statistics like Paired 't' test were used to evaluate post-test knowledge and Practice level. Karl Pearson Correlations were used to assess the relationship between the level of knowledge and Practice, chi-square was used to associate the post-test level of knowledge and Practice with the selected demographic and clinical variables.

RESULT

Table No. 1: Demographic characteristics of the participants in the experimental and control group

N = 130(65+65)

Demographic Variables	Experimental Group		Control Group	
	(n)	%	(n)	%
Age in Years				
20 – 35 years	9	13.8	7	10.8
36-45 Years	12	18.5	13	20.0
46-60Years	33	50.8	33	50.8
Above 60 years	11	16.9	12	18.5
Gender				
Male	30	46.2	25	38.5
Female	35	53.8	40	61.5
Others	-	-	-	-
Religion				
Hindu	50	76.9	46	70.8
Muslim	7	10.8	8	12.3
Christian	8	12.3	11	16.9
Others	-	-	-	-
Marital status				
Married	47	72.3	42	64.6
Unmarried	8	12.3	10	15.4
Divorce	-	-	-	-
Widow	10	15.4	13	20.0
Area				
Urban	4	6.2	5	7.7
Rural	61	93.8	60	92.3

Demographic Variables	Experimental Group		Control Group	
	(n)	%	(n)	%
Educational status				
Primary school	25	38.5	25	38.5
High school	3	4.6	4	6.2
Higher secondary	4	6.2	4	6.2
Diploma	9	13.8	8	12.3
Graduate	23	35.4	24	36.9
Illiterate	1	1.5	0	0
Occupation				
Skilled worker	21	32.3	16	24.6
Unskilled worker	20	30.8	15	23.1
Unemployed	24	36.9	33	50.8
Others	0	0	1	1.5
Income / month				
Rs.< 5000	21	32.3	23	35.4
Rs.5001-20000	35	53.8	37	56.9
Rs.21000-30000	9	13.8	5	7.7
Above 30000	-	-	-	-
Dietary pattern				
Vegetarian	3	4.6	6	9.2
Non vegetarian	62	95.4	59	90.8
Type of diabetes mellitus				
Type 1	12	18.5	11	16.9
Type 2	53	81.5	54	83.1
Family history of DM				
Yes	31	47.7	30	46.2
No	34	52.3	35	53.8
Present treatment history				

Demographic Variables	Experimental Group		Control Group	
	(n)	%	(n)	%
Oral hypoglycaemic agent	44	67.7	44	67.7
Insulin	21	32.3	21	32.3
Non-Pharmacological management	-	-	-	-
How long you're in treatment				
<5 years	20	30.8	20	30.8
>5 years	45	69.2	45	69.2

N.S – Not Significant

Table 1 shows that in the experimental group, half of the diabetics 33(50.8%) were aged between 46-60 years, around 35(53.8%) patients were female, most of the diabetics 50(76.9%) were Hindus, most of the diabetics 47(72.3%) were married, majority of the diabetics 61(93.8%) were residing in a rural area, 25(38.5%) diabetics had primary school education, 24(36.9%) diabetics were unemployed, 35(53.8%) had an income of Rs.5001-20000, majority of diabetics 62(95.4%) were non-vegetarian, 53(81.5%) had type 2 DM, 34(81.5%) diabetics had no family history of DM, 44(67.7%) had an oral hypoglycaemic agent and 45(69.2%) were under treatment for >5 years.

In the control group, most of the diabetics 33(50.8%) were aged between 46-60 years, around 40(61.5%) were female, most of them 46(70.8%) were Hindus, most of the diabetics 42(64.6%) were married, majority of the diabetics 60(92.3%) were residing in a rural area, 25(38.5%) diabetics had primary school education, 33(50.8%) were unemployed, 37(56.9%) had an income of Rs.5001-20000, majority of them 59(90.8%) were non-vegetarian, 54(83.1%) diabetics had type 2 DM, 35(53.8%) had no family history of DM, 44(67.7%) had an oral hypoglycaemic agent and 45(69.2%) were under treatment for >5 years.

Table No. 2: Distribution of clinical variables among diabetic patients in the experimental and control group

N = 130(65+65)

Clinical Variables	Normal Values	Experimental group		Control group	
		No.	%	No.	%
Temperature	Hypothermia (<37°C)	0	0	2	3.08
	Normal (37°C)	63	96.92	62	95.38
	Hyperthermia (>37°C)	2	3.08	1	1.54
Pulse Rate	Bradycardia (<70)	0	0	0	0
	Normal (70 – 100)	65	100.0	65	100.0
	Tachycardia (>100)	0	0	0	0
Respiratory Rate	Bradypnea (<12)	0	0	0	0
	Normal (12 – 24)	65	100.0	65	100.0
	Tachypnea (>24)	0	0	0	0
Systolic BP	Hypotension (<90)	0	0	1	1.54
	Normal (90 – 120)	59	90.77	58	89.23
	Hypertension (>120)	6	9.23	6	9.23
Diastolic BP	Hypotension (<60)	0	0	0	0
	Normal (60 – 80)	65	100.0	65	100.0
	Hypertension (>80)	0	0	0	0
Random Blood Sugar	Hypoglycemia (<70)	0	0	0	0
	Normal (70 – 200)	1	1.54	4	6.15
	Hyperglycemia (>200)	64	98.46	61	93.85
BMI	Underweight (<18.5)	11	16.92	10	15.38
	Normal Weight (18.5 – 24.9)	45	69.23	47	72.31
	Pre-obesity (25.0 – 29.9)	9	13.85	8	12.31
	Obesity class I (30.0 – 34.9)	0	0	0	0
	Obesity class II (35.0 – 39.9)	0	0	0	0
	Obesity Class III (≥40)	0	0	0	0

The above table 2 shows that in the experimental group, with regard to temperature most of them 63(96.92%) had a normal temperature. Concerning PR, 65(100%) diabetics had normal pulse rate. About RR 65(100%) diabetics had normal RR. Considering the systolic BP, 59(90.77%) had normal systolic BP. Regarding the diastolic BP, 65(100%) had normal diastolic BP. For

RBS, 64(98,46%) diabetics had hyperglycemia. With regard to BMI, most of them 45(69.23%) had normal weight.

In the control group, with regard to temperature, most of them 62(95.38%) had a normal temperature. To PR, 65(100%) had a normal pulse rate. Concerning RR 65(100%) had normal RR. Considering the systolic BP, 58(89.23%) had normal systolic BP. Regarding the diastolic BP, 65(100%) had normal diastolic BP. For RBS, 61(93.85%) diabetics had hyperglycemia. About BMI, most of them 47(72.31%) had normal weight.

Table No. 3: Frequency and percentage distribution of pretest and post-test level of knowledge on self-care management among diabetic patients in the experimental group

N = 65

Knowledge	Pre Test						Post Test					
	Inadequate		Moderate		Adequate		Inadequate		Moderate		Adequate	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
General Knowledge	37	56.92	26	40.0	2	3.08	5	7.69	21	32.31	39	60.0
Dietary Management	40	61.54	25	38.46	0	0	2	3.08	6	9.23	57	87.69
Self-monitoring of blood glucose & oral diabetic pills/insulin therapy	8	12.31	35	53.85	22	33.85	0	0	12	18.46	53	81.54
Lifestyle modification factors	52	80.0	13	20.0	0	0	1	1.54	18	27.69	46	70.77
Prevention of complications	2	3.08	44	67.69	19	29.23	0	0	20	30.77	45	69.23
General care factor	62	95.38	3	4.62	0	0	4	6.15	19	29.23	42	64.62
Overall	34	52.31	31	47.69	0	0	0	0	19	29.23	46	70.77

Table 3 shows with respect to general knowledge, 37(56.92%) had inadequate knowledge, 26(40%) had moderate knowledge and 2(3.08%) had adequate knowledge. Considering dietary management 40(61.54%) had inadequate knowledge and 25(38.46%) had moderate knowledge. Regarding self-monitoring of blood glucose & oral diabetic pills/insulin therapy, 35(53.85%) had moderate knowledge, 22(33.85%) had adequate knowledge and 8(12.31%) had inadequate knowledge. About the lifestyle modification factors, 52(80%) had inadequate knowledge and 13(20%) had moderate knowledge. For prevention of complications, 44(67.69%) had moderate knowledge, 19(29.23) had adequate knowledge and 2(3.08%) had inadequate knowledge. The general care factor revealed that 62(95.38%) had inadequate knowledge and 3(4.62%) had moderate knowledge. The overall pretest knowledge in the experimental group revealed that 34(52.31%) had inadequate knowledge and 31(47.69%) had moderate knowledge.

Table 3 also shows that in the post-test of the experimental group with respect to general knowledge, 39(60%) had adequate knowledge, 21(32.31%) had moderate knowledge and 5(7.69%) had inadequate knowledge. Considering dietary management 57(87.69%) had adequate knowledge, 6(9.23%) had moderate knowledge and 2(3.08%) had adequate knowledge. Regarding self-monitoring of blood glucose & oral diabetic pills/insulin therapy, 53(81.54%) had adequate knowledge and 12(18.46%) had moderate knowledge. About the lifestyle modification factors, 46(70.77%) had adequate knowledge, 18(27.69%) had moderate knowledge and 1(1.54%) had inadequate knowledge. For prevention of complications, 45(69.23%) had adequate knowledge and 20(30.77) had moderate knowledge. The general care factor revealed that 42(64.62%) had adequate knowledge, 19(29.23%) had moderate knowledge and 4(6.15%) had inadequate knowledge. The overall post-test knowledge in the experimental group revealed that 46(70.77%) had adequate knowledge and 19(29.23%) had moderate knowledge.

Table No. 4: Frequency and percentage distribution of pretest and post-test level of knowledge on self-care management among diabetic patients in the control group

N = 65

Knowledge	Pre Test						Post Test					
	Inadequate		Moderate		Adequate		Inadequate		Moderate		Adequate	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
General Knowledge	34	52.31	30	46.15	1	1.54	35	53.85	28	43.08	2	3.08
Dietary Management	40	61.54	22	33.85	3	4.62	33	50.77	26	40.0	6	9.23
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	6	9.23	31	47.69	28	43.08	8	12.31	30	46.15	27	41.54
Life style modification factors	58	89.23	7	10.77	0	0	55	84.62	10	15.38	0	0
Prevention of complications	4	6.15	38	58.46	23	35.38	5	7.69	36	55.38	24	36.92
General care factor	61	93.85	4	6.15	0	0	61	93.85	4	6.15	0	0
Overall	34	52.31	31	47.69	0	0	32	49.23	33	50.77	0	0

Table 4 shows that in the pretest of control group for general knowledge, 34(52.31%) had inadequate knowledge, 30(46.15%) had moderate knowledge and 1(1.54%) had adequate knowledge. Regarding dietary management 40(61.54%) had inadequate knowledge, 22(33.85%) had moderate knowledge and 3(4.62%) had adequate knowledge. Considering self-monitoring of blood glucose & oral diabetic pills/insulin therapy, 31(47.69%) had moderate knowledge, 28(43.08%) had adequate knowledge and 6(9.23%) had inadequate knowledge. Regarding the lifestyle modification factors, 58(89.23%) had inadequate knowledge and 7(10.77%) had

moderate knowledge. For prevention of complications, 38(58.46%) had moderate knowledge, 23(35.38) and 4(6.15%) had inadequate knowledge. The general care factor revealed that 61(93.85%) had inadequate knowledge and 4(6.15%) had moderate knowledge. The overall pretest knowledge in the control group revealed that 34(52.31%) had inadequate knowledge and 31(47.69%) had moderate knowledge.

Table 4 also shows that in the post-test of a control group for general knowledge, 35(53.85%) had inadequate knowledge, 28(43.08%) had moderate knowledge and 2(3.08%) had adequate knowledge. Regarding dietary management 33(50.7%) had inadequate knowledge, 26(40%) had moderate knowledge and 6(9.23%) had adequate knowledge. Considering self-monitoring of blood glucose & oral diabetic pills/insulin therapy, 30(46.15%) had moderate knowledge, 27(41.54%) had adequate knowledge and 8(12.31%) had inadequate knowledge. Regarding the lifestyle modification factors, 55(84.62%) had inadequate knowledge and 10(15.38%) had moderate knowledge. With respect to prevention of complications, 36(55.38%) had moderate knowledge, 24(36.92) and 5(7.69%) had inadequate knowledge. The general care factor revealed that 61(93.85%) had inadequate knowledge and 4(6.15%) had moderate knowledge. The overall post-test knowledge in the control group revealed that 33(50.77%) had moderate knowledge and 32(49.23%) had inadequate knowledge.

Table No. 5: Frequency and percentage distribution of pretest and posttest level of practice on self-care management among diabetic patients in the experimental group

N = 65

Practice	Pretest						Posttest					
	Poor		Moderate		Good		Poor		Moderate		Good	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Dietary management	0	0	48	73.85	17	26.15	0	0	1	1.54	64	98.46
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	0	0	2	3.08	63	96.92	0	0	0	0	65	100.0
Lifestyle modification factors	42	64.62	23	35.38	0	0	0	0	13	20.0	52	80.0
Prevention of complications	0	0	6	9.23	59	90.77	0	0	0	0	65	100.0
General care factor	3	4.62	61	93.85	1	1.54	0	0	0	0	65	100.0
Overall	0	0	60	92.31	5	7.69	0	0	0	0	65	100.0

Table 5 shows that in the pretest of the experimental group with respect to dietary management 48(73.85%) had moderate practice and 17(26.15%) had good practice. Considering self-monitoring of blood glucose & oral diabetic pills/insulin therapy, 63(96.92%) had good practice and 2(3.08%) had moderate practice. Regarding the lifestyle modification factors, 42(64.62%) had poor practice and 23(35.38%) had moderate practice. To prevention of complications, 59(90.77%) had a good practice and 6(9.23%) had moderate practice. The general care factor revealed that 61(93.85%) had moderate practice, 3(4.62%) had poor practice and 1(1.54%) had good practice. The overall pretest practice in the experimental group revealed that all 60(92.31%) had moderate practice on self-management and 5(7.69%) had good practice.

Table 5 also shows that in the post test of the experimental group with respect to dietary management 64(98.46%) had good practice and 1(1.54%) had moderate practice. Considering

self-monitoring of blood glucose & oral diabetic pills/insulin therapy, 65(100%) had good practice. Regarding the lifestyle modification factors, 52(80%) had good practice and 13(20%) had moderate practice. To the prevention of complications, 65(100%) had good practice. The general care factor revealed that 65(100%) had good practice. The overall post test practice in the experimental group revealed that all 65(100%) had good practice on self-management.

Table No. 6: Frequency and percentage distribution of pretest and post-test level of practice on self-care management among diabetic patients in control group

N= 65

Practice	Pretest						Posttest					
	Poor		Moderate		Good		Poor		Moderate		Good	
	N o.	%	No.	%	N o.	%	N o.	%	N o.	%	N o.	%
Dietary management	0	0	42	64.62	23	35.38	0	0	40	61.54	25	38.46
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	0	0	1	1.54	64	98.46	0	0	1	1.54	64	98.46
Life style modification factors	45	69.23	20	30.77	0	0	46	70.77	19	29.23	0	0
Prevention of complications	0	0	13	20.0	52	80.0	0	0	12	18.46	53	81.54
General care factor	4	6.15	59	90.77	2	3.08	3	4.62	60	92.31	2	3.08
Overall	0	0	58	89.23	7	10.77	0	0	57	87.69	8	12.31

Table 6 shows that in the pretest of control group with regard to dietary management 42(64.62%) had moderate practice and 23(35.38%) had good practice. Regarding self-monitoring of blood glucose & oral diabetic pills/insulin therapy, 64(98.46%) had good practice and 1(1.54%) had moderate practice. Considering the lifestyle modification factors, 45(69.23%) had poor practice and 20(30.77%) had moderate practice. Concerning prevention of complications, 52(80%) had

good practice and 13(20%) had moderate practice. The general care factor revealed that 59(90.77%) had moderate practice, 4(6.15%) had poor practice and 2(3.08%) had good practice. The overall pretest practice in the control group revealed that 58(89.23%) had moderate practice and 7(10.77%) had good practice on self-management.

The table 6 also shows that in the post-test of control group with regard to dietary management 40(61.54%) had moderate practice and 25(38.46%) had good practice. Regarding self-monitoring of blood glucose & oral diabetic pills/insulin therapy, 64(98.46%) had good practice and 1(1.54%) had moderate practice. Considering the lifestyle modification factors, 46(70.77%) had poor practice and 19(29.23%) had moderate practice. For prevention of complications, 53(81.54%) had good practice and 12(18.46%) had moderate practice. The general care factor revealed that 60(92.31%) had moderate practice, 3(4.62%) had poor practice and 2(3.08%) had good practice. The overall posttest practice in the control group revealed that 57(87.69%) had moderate practice and 8(12.31%) had good practice on self-management.



Table No. 7: Effectiveness of selected nursing interventions on level of knowledge on self-care management among diabetic patients in experimental group

N = 65

Variables	Test	Mean	S.D	Mean Diff. Score	Paired 't' Test value
General Knowledge	Pretest	7.54	1.49	3.26	t = 12.257 p = 0.0001, S****
	Post Test	10.80	1.93		
Dietary management	Pretest	2.37	0.52	1.68	t = 20.362 p = 0.0001, S****
	Post Test	4.05	0.65		
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	Pretest	3.38	0.96	0.79	t = 9.091 p = 0.0001, S****
	Post Test	4.17	0.72		
Life style modification factors	Pretest	1.82	0.75	2.01	t = 18.964 p = 0.0001, S****
	Post Test	3.83	0.67		
Prevention of complications	Pretest	2.26	0.51	0.43	t = 6.560 p = 0.0001, S****
	Post Test	2.69	0.47		
General care factor	Pretest	2.15	0.78	2.60	t = 18.125 p = 0.0001, S****
	Post Test	4.75	0.92		
Overall	Pretest	19.52	2.37	10.77	t = 26.413 p = 0.0001, S****
	Post Test	30.29	3.09		

***p<0.001, S – Significant

The table 7 shows the comparison of pretest and post test knowledge scores on self-care management among diabetic patients in experimental group. The calculated paired t' test value for general knowledge (**t=12.257, p=0.0001**), dietary management (**t=20.362, p=0.0001**), self-monitoring of blood glucose & oral diabetic pills / insulin therapy (**t=9.091, p=0.0001**), life style

modification factors ($t=18.964$, $p=0.0001$), prevention of complication ($t=6.560$ $p=0.0001$), general care practice ($t=18.125$, $p=0.0001$) and for the overall post test knowledge score ($t=26.413$, $p=0.0001$) was found to be statistically significant at $p<0.001$ level.

Table No. 8: Comparison of Pretest and post-test level knowledge on self-care management among diabetic patients in control group

N = 65

Variables	Test	Mean	S.D	Mean Diff. Score	Paired 't' Test value
General Knowledge	Pretest	7.52	1.46	-0.04	t = 0.466
	Post Test	7.48	1.61		p = 0.643, N.S
Dietary management	Pretest	2.42	0.61	0.10	t = 1.840
	Post Test	2.52	0.75		p = 0.070, N.S
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	Pretest	3.55	0.98	-0.04	t = 1.760
	Post Test	3.51	1.02		p = 0.083, N.S
Life style modification factors	Pretest	1.71	0.65	0.09	t = 1.350
	Post Test	1.80	0.71		p = 0.182, N.S
Prevention of complications	Pretest	2.29	0.58	0.00	t = 0.000
	Post Test	2.29	0.61		p = 1.000, N.S
General care factor	Pretest	2.26	0.79	0.05	t = 1.000
	Post Test	2.31	0.79		p = 0.321, N.S
Overall	Pretest	19.75	2.38	0.16	t = 1.182
	Post Test	19.91	2.63		p = 0.242, N.S

N.S – Not Significant

The table 8 shows the pretest and post test knowledge scores on self-management among diabetic patients in control group. The calculated paired ‘t’ test value for general knowledge (t=0.466, p=0.643), dietary management (t=1.840, p=0.070), self-monitoring of blood glucose & oral diabetic pills / insulin therapy (t=1.760, p=0.083), life style modification factors (t=01.350, p=0.182), prevention of complication (t=0.000, p=1.000), general care practice (t=1.000, p=0.321) and for the overall knowledge score (t=1.182, p=0.242) was not found to be statistically significant.

The calculated paired ‘t’ test value was no statistically significant difference in all the domains of knowledge and for overall post-test knowledge score in the control group.

Table No. 9: Effectiveness of selected nursing interventions on level of practice on self-care management among diabetic patients in the experimental group

N = 65

Variables	Test	Mean	S.D	Mean Diff. Score	Paired ‘t’ Test value
Dietary management	Pretest	14.78	0.96	3.74	t = 22.335 p = 0.0001, S***
	Post Test	18.52	1.15		
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	Pretest	23.82	1.21	2.72	t = 15.344 p = 0.0001, S***
	Post Test	26.54	1.12		
Life style modification factors	Pretest	6.43	0.98	3.80	t = 23.118 p = 0.0001, S***
	Post Test	10.23	0.86		
Prevention of complications	Pretest	10.45	0.75	0.73	t = 6.981 p = 0.0001, S***
	Post Test	11.18	0.70		
General care factor	Pretest	11.12	0.84	7.43	t = 44.900 p = 0.0001, S***
	Post Test	18.55	0.98		
Overall	Pretest	66.60	2.28	18.43	t = 41.873 p = 0.0001, S***
	Post Test	85.03	2.65		

***p<0.001, S – Significant

Table 9 shows the comparison of pretest and post-test practice scores on self-management among diabetic patients in experimental group. The calculated paired t' test value for dietary management ($t=22.335$, $p=0.0001$), self-monitoring of blood glucose & oral diabetic pills / insulin therapy ($t=15.344$, $p=0.0001$), lifestyle modification factors ($t=23.118$, $p=0.0001$), prevention of complication ($t=6.981$ $p=0.0001$), general care practice ($t=44.900$, $p=0.0001$) and for the overall post-test practice score ($t=41.873$, $p=0.0001$) was found to be statistically significant at $p<0.001$ level. This clearly shows that there was a significant difference between the pretest and post-test level of practice score in the experimental group which further infers that selected nursing interventions on practice on self-care management administered among diabetic patients in the experimental group were found to be effective in improving the level of practice in the post-test.

Table No. 10: Comparison of Pretest and post-test level of practice on self-care management among diabetic patients in the control group

N = 65

Variables	Test	Mean	S.D	Mean Diff. Score	Paired 't' Test value
Dietary management	Pretest	14.94	1.18	0.03	t = 0.814 p = 0.418, N.S
	Post Test	14.97	1.19		
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	Pretest	24.17	1.09	0.06	t = 1.655 p = 0.103, N.S
	Post Test	24.23	1.13		
Life style modification factors	Pretest	6.08	1.02	0.02	t = 0.375 p = 0.709, N.S
	Post Test	6.06	1.01		
Prevention of complications	Pretest	10.23	0.99	0.00	t = 0.000 p = 1.000, N.S
	Post Test	10.23	0.98		
General care factor	Pretest	11.31	1.16	0.00	t = 0.000 p = 1.000, N.S
	Post Test	11.31	1.14		
Overall	Pretest	66.72	2.65	0.11	t = 0.867 p = 0.389, N.S
	Post Test	66.83	2.55		

***p<0.001, S – Significant

The table 10 shows the pretest and post test practice scores on self- care management among diabetic patients in control group. The calculated paired ‘t’ test value for dietary management (t=0.814, p=0.418), self-monitoring of blood glucose & oral diabetic pills / insulin therapy (t=1.655, p=0.103), life style modification factors (t=0.375, p=0.709), prevention of complication (t=0.000, p=1.000), general care practice (t=0.000, p=1.000) and for the overall practice score (t=0.867, p=0.389) was not found to be statistically significant.

The calculated paired ‘t’ test value was no statistically significant difference in all the domains of practice and for the overall post-test practice score in the control group.

Table No. 11: Comparison of posttest level of knowledge on self-care management among diabetic patients between the experimental and control group

N = 130(65+65)

Variables	Test	Mean	S.D	Mean Diff. Score	Student Independent ‘t’ Test value
General Knowledge	Experimental	10.80	1.93	3.32	t = 10.655 p = 0.0001, S***
	Control	7.48	1.61		
Dietary management	Experimental	4.05	0.65	1.53	t = 12.369 p = 0.0001, S***
	Control	2.52	0.75		
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	Experimental	4.17	0.72	0.66	t = 4.280 p = 0.0001, S***
	Control	3.51	1.02		
Life style modification factors	Experimental	3.83	0.67	2.03	t = 16.697 p = 0.0001, S***
	Control	1.80	0.71		
Prevention of complications	Experimental	2.69	0.47	0.40	t = 4.225 p = 0.0001, S***
	Control	2.29	0.61		
General care factor	Experimental	4.75	0.92	2.44	t = 16.281 p = 0.0001, S***
	Control	2.31	0.79		
Overall	Experimental	30.29	3.09	10.38	t = 20.642 p = 0.0001, S***
	Control	19.91	2.63		

***p<0.001, S – Significant

The table 11 shows the post test knowledge scores on self- care management among diabetic patients between the experimental and control group. The calculated student independent ‘t’ test value for general knowledge (**t=10.655, p=0.0001**), dietary management (**t=12.369, p=0.0001**), self-monitoring of blood glucose & oral diabetic pills / insulin therapy (**t=4.280, p=0.0001**), life style modification factors (**t=16.697, p=0.0001**), prevention of complication (**t=4.225, p=0.0001**), general care practice (**t=16.281, p=0.0001**) and for the overall post test knowledge score (**t=20.642, p=0.0001**) was found to be statistically significant at $p<0.001$ level.

Table No. 12: Comparison of posttest level of practice on self-care management among diabetic patients between the experimental and control group

N = 130(65+65)

Variables	Test	Mean	S.D	Mean Diff. Score	Student Independent ‘t’ Test value
Dietary management	Experimental	18.52	1.15	3.55	t = 17.369 p = 0.0001, S***
	Control	14.97	1.19		
Self-monitoring of blood glucose & oral diabetic pills / insulin therapy	Experimental	26.54	1.12	2.31	t = 11.705 p = 0.0001, S***
	Control	24.23	1.13		
Life style modification factors	Experimental	10.23	0.86	4.17	t = 25.264 p = 0.0001, S***
	Control	6.06	1.01		
Prevention of complications	Experimental	11.18	0.70	0.95	t = 6.368 p = 0.0001, S***
	Control	10.23	0.98		
General care factor	Experimental	18.55	0.98	7.24	t = 38.691 p = 0.0001, S***
	Control	11.31	1.14		
Overall	Experimental	85.03	2.65	18.20	t = 39.865 p = 0.0001, S***
	Control	66.83	2.55		

*** $p<0.001$, S – Significant

The table 12 shows the post test practice scores on self- care management among diabetic patients between the experimental and control group. The calculated student independent ‘t’ test value for dietary management ($t=17.369$, $p=0.0001$), self-monitoring of blood glucose & oral diabetic pills / insulin therapy ($t=11.705$, $p=0.0001$), life style modification factors ($t=25.264$, $p=0.0001$), prevention of complication ($t=6.368$, $p=0.0001$), general care practice ($t=38.691$, $p=0.0001$) and for the overall post test practice score ($t=39.865$, $p=0.0001$) was found to be statistically significant at $p<0.001$ level.

Table No. 13: Correlation between post test knowledge and practice scores on self-care management among diabetic patients in experimental and control group

N=130(65+65)

Group	Variables	Mean	S.D	Karl Pearson’s Correlation ‘r’ value
Experimental	Knowledge	30.29	3.09	r = 0.408 p = 0.001, S***
	Practice	85.03	2.65	
Control	Knowledge	19.91	2.63	r= 0.097 p = 0.443, N.S
	Practice	66.80	2.56	

*** $p\leq 0.001$, S – Significant, N.S – Not Significant

Table 13 shows that in the experimental group, the post mean score of knowledge was 30.29 ± 3.09 and the post-test mean score of practice was 85.03 ± 2.65 . The calculated Karl Pearson’s Correlation value of $r = 0.408$ shows a moderate positive correlation which was found to be statistically significant at $p<0.001$ level. This infers that when the knowledge on self-care management of diabetes among diabetic patients increases their practice level also increases.

Table 13 also shows that in the control group, the post mean score of knowledge was 19.91 ± 2.63 and the posttest mean score of practice was 66.80 ± 2.56 . The calculated Karl Pearson’s Correlation value of $r = 0.097$ shows a positive correlation but was not found to be statistically significant.

Table No. 14: Association of the post-test level of knowledge on self-care management among diabetic patients with their selected demographic variables in the experimental group

N = 65

Demographic Variables	Moderate		Adequate		Chi-Square Value
	No.	%	No.	%	
Age in Years					$\chi^2=2.596$ d.f=3 p = 0.458 N.S
20 – 35 years	3	4.6	6	9.2	
36-45 Years	4	6.2	8	12.3	
46-60Years	7	10.8	26	40.0	
Above 60 years	5	7.7	6	9.2	
Gender					$\chi^2=0.177$ d.f=1 p = 0.674 N.S
Male	8	12.3	22	33.8	
Female	11	16.9	24	36.9	
Others	-	-	-	-	
Religion					$\chi^2=0.085$ d.f=2 p = 0.958 N.S
Hindu	15	23.1	35	53.8	
Muslim	2	3.1	5	7.7	
Christian	2	3.1	6	9.2	
Others	-	-	-	-	
Marital status					$\chi^2=13.428$ d.f=2 p = 0.001 S***
Married	13	20.0	40	61.5	
Unmarried	5	7.7	0	0	
Divorce	-	-	-	-	
Widow	1	1.5	6	9.2	
Area					$\chi^2=1.127$ d.f=1 p = 0.288 N.S
Urban	3	4.6	13	20.0	
Rural	16	24.6	33	50.8	

Demographic Variables	Moderate		Adequate		Chi-Square Value
	No.	%	No.	%	
Educational status					$\chi^2=2.728$ d.f=5 p = 0.742 N.S
Primary school	7	10.8	18	27.7	
High school	2	3.1	1	1.5	
Higher secondary	1	1.5	3	4.6	
Diploma	2	3.1	7	10.8	
Graduate	7	10.8	16	24.6	
Illiterate	0	0	1	1.5	
Occupation					$\chi^2=0.373$ d.f=2 p = 0.830 N.S
Skilled worker	6	9.2	15	23.1	
Unskilled worker	5	7.7	15	23.1	
Unemployed	8	12.3	16	24.6	
Others	-	-	-	-	
Income / month					$\chi^2=4.801$ d.f=2 p = 0.091 N.S
Rs.< 5000	9	13.8	12	18.5	
Rs.5001-20000	9	13.8	22	33.8	
Rs.21000-30000	1	1.5	12	18.5	
Above 30000	-	-	-	-	
Dietary pattern					$\chi^2=0.026$ d.f=1 p = 0.873 N.S
Vegetarian	1	1.5	2	3.1	
Non vegetarian	18	27.7	44	67.7	
Type of diabetes mellitus					$\chi^2=0.127$ d.f=1 p = 0.721 N.S
Type 1	3	4.6	9	13.8	
Type 2	16	24.6	37	56.9	
Family history of DM					$\chi^2=0.336$ d.f=1 p = 0.562
Yes	8	12.3	23	35.4	
No	11	16.9	23	35.4	

Demographic Variables	Moderate		Adequate		Chi-Square Value
	No.	%	No.	%	
					N.S
Present treatment history					$\chi^2=0.441$ d.f=1 p = 0.507
Oral hypoglycemic agent	14	21.5	30	46.2	
Insulin	5	7.7	16	24.6	
Non-Pharmacological management	-	-	-	-	N.S
How long you're in treatment					$\chi^2=3.909$ d.f=1 p = 0.048 S*
<5 years	3	4.6	19	29.2	
>5 years	16	24.6	27	41.5	

*p<0.05, S – Significant, N.S – Not Significant

Table 14 shows that the demographic variables Marital status ($\chi^2=13.428$, $p = 0.001$) and how long you are in treatment ($\chi^2=3.909$, $p=0.048$) had shown statistically significant association with the post-test level of knowledge on self-management among diabetic patients in the experimental group at $p<0.05$ level. The other demographic variables had not shown a statistically significant association with the post-test level of knowledge on self-management among diabetic patients in the experimental group.

Table No. 15: Association of post-test level of practice on self-care management among diabetic patients with their selected demographic variables in experimental group

N = 65

Demographic Variables	≤Mean (85.03)		>Mean (85.03)		Chi-Square Value
	No.	%	No.	%	
Age in Years					$\chi^2=0.859$ d.f=3 p = 0.835 N.S
20 – 35 years	6	9.2	3	4.6	
36-45 Years	8	12.3	4	6.2	
46-60Years	18	27.7	15	23.1	
Above 60 years	7	10.8	4	6.2	
Gender					$\chi^2=0.000$ d.f=1 p = 1.000 N.S
Male	18	27.7	12	18.5	
Female	21	32.3	14	21.5	
Others	-	-	-	-	
Religion					$\chi^2=1.464$ d.f=2 p = 0.481 N.S
Hindu	28	43.1	22	33.8	
Muslim	5	7.7	2	3.1	
Christian	6	9.2	2	3.1	
Others	-	-	-	-	
Marital status					$\chi^2=0.027$ d.f=2 p = 0.987 N.S
Married	32	49.2	21	32.3	
Unmarried	3	4.6	2	3.1	
Divorce	-	-	-	-	
Widow	4	6.2	3	4.6	
Area					$\chi^2=0.055$ d.f=1 p = 0.814 N.S
Urban	10	15.4	6	9.2	
Rural	29	44.6	20	30.8	
Educational status					$\chi^2=5.803$

Demographic Variables	≤Mean (85.03)		>Mean (85.03)		Chi-Square Value
	No.	%	No.	%	
Primary school	12	18.5	13	20.0	d.f=5 p = 0.326 N.S
High school	3	4.6	0	0	
Higher secondary	3	4.6	1	1.5	
Diploma	6	9.2	3	4.6	
Graduate	15	23.1	8	12.3	
Illiterate	0	0	1	1.5	
Occupation					$\chi^2=1.994$ d.f=2 p = 0.369 N.S
Skilled worker	10	15.4	11	16.9	
Unskilled worker	13	20.0	7	10.8	
Unemployed	16	24.6	8	12.3	
Others	-	-	-	-	
Income / month					$\chi^2=6.943$ d.f=2 p = 0.031 S*
Rs.< 5000	16	24.6	5	7.7	
Rs.5001-20000	19	29.2	12	18.5	
Rs.21000-30000	4	6.2	9	13.8	
Above 30000	-	-	-	-	
Dietary pattern					$\chi^2=0.932$ d.f=1 p = 0.334 N.S
Vegetarian	1	1.5	2	3.1	
Non vegetarian	38	58.5	24	36.0	
Type of diabetes mellitus					$\chi^2=0.273$ d.f=1 p = 0.602 N.S
Type 1	8	12.3	4	6.2	
Type 2	31	47.7	22	33.8	
Family history of DM					$\chi^2=0.093$ d.f=1 p = 0.761
Yes	18	27.7	13	20.0	
No	31	32.3	13	20.0	

Demographic Variables	≤Mean (85.03)		>Mean (85.03)		Chi-Square Value
	No.	%	No.	%	
					N.S
Present treatment history					$\chi^2=0.106$
Oral hypoglycemic agent	27	41.5	17	26.2	d.f=1
Insulin	12	18.5	9	13.8	p = 0.745
Non-Pharmacological management	-	-	-	-	N.S
How long you're in treatment					$\chi^2=0.011$
<5 years	13	20.0	9	13.8	d.f=1
>5 years	26	40.0	17	26.2	p = 0.915 N.S

*p<0.05, S – Significant, N.S – Not Significant

Table 15 shows that the demographic variable income per month ($\chi^2=6.943$, $p=0.031$) had shown a statistically significant association with post-test practice score on self-management among diabetic patients in the experimental group at p<0.05 level. The other demographic variables had not shown a statistically significant association with post-test practice score on self-management among diabetic patients in the experimental group.

DISCUSSION

The results of the present study showed that the level of knowledge on self-care management, 46(70.77%) diabetic patients had adequate knowledge and 65(100%) diabetic patients had good practice on self-care management in the experimental group. Whereas in the control group post-test illustrated the level of knowledge on self-care management, 33(50.77%) diabetic patients had moderate knowledge and 57(87.69%) had moderate practice on self-care management.

The present study was supported with the study conducted by **Gaikar P, Kale M, Halemani S (2017)** conducted a study on Knowledge Regarding Self-Care Management among Newly Diagnosed Type 2 Diabetic Clients Attended OPD at Parshuram Hospital, Ghanekhunt-Lote, Ratnagiri Dist, Maharashtra State. A quantitative approach and Descriptive research design were

used. 30 samples were recruited by using the Purposive sampling technique. a self-administered questionnaire was used. descriptive statistics and inferential statistics were used. The knowledge level of the clients, 14 (46.67%) clients had good knowledge, 16(53.33%) clients had Average knowledge. And none of the client had poor knowledge.¹³

The findings of the study are supported by **Abd-Alrahman Ali Dinar N M, et al (2019)** who conducted a quazi experimental study on Effect of diabetes educational program on self-care and diabetes control among type 2 diabetic patients attending for follow up at Diabetic Center in King Fahd Hospital in AlBaha. 61 patients were recruited by using the convenience sampling technique. Data was collected by diabetes self-care scale (DSCS) form. Data was analyzed using SPSS version 22. The study reveals that diabetes education has been delivered to about 52.5% of patients by doctor, nurses or dietitian 34.4%. The metabolic control parameters among diabetic patients showed that (HbA1c) has been significantly dropped from 8.66 to 7.73 after intervention and triglyceride significantly dropped from 152.62 to 150.57, other metabolic parameters were insignificantly decreased after the intervention. The diabetes self-care scale was significantly improved after intervention, from 2.4 to 3.3.¹⁴

The study findings are supported by the study conducted by **Bett SJ (2019)**. HbA1c was collected before and after the intervention. The study reveals that (86%) had completed the project (60 control and 63 experimental). The results showed that the experimental group had significantly reduced their levels of HbA1c compared to the control group ($F(1, 122) = 9.989, p=0.002$). Also, the experimental group improved their diabetic knowledge ($t=7.218, p<0.001$), and self-efficacy ($F(1, 117) = 14.342, p<0.001$) significantly compared to the control group.¹⁵

The present study was supported by the study conducted by **Viji P. T, et al (2014)** which was supported the present study. The result of the research indicates that mean score (9.44) with S.D of 2.06 of practice towards self-care activities among diabetic patients and this value indicates that the practice of diabetic patients towards self-care activities was not satisfactory and the result showed that a significant association between practice toward self-care activities in diabetic patients with socio-demographic variables such as gender, age, marital status, type of the family, educational status, dietary habits and duration of diabetes.¹⁶

RECOMMENDATION

- Replication of the study may be done with the large samples in different settings to generalize the study findings.
- This study can be conducted by using the probability sampling technique.
- This study can be conducted in community health centers and district hospitals.
- A comparative study can be done between the selected nursing interventions and other alternative methods.
- A follow-up study may be taken up to determine the long-term effects of intervention in terms of their level of knowledge and practice.

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