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Effect of Nursing Intervention on Knowledge about Diabetes Mellitus and Prevention of Its Complications among Diabetics Attending Two Selected State Hospitals, Ogun State

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Abstract: *Morbidity and mortality associated with diabetes mellitus and its complication has been on the increase due to inadequate knowledge about management of diabetes mellitus and prevention of its complications among patients. The study assessed the effect of nursing intervention on knowledge about diabetes mellitus and prevention of its complications among diabetics attending two selected State Hospitals, Ogun State.*

This study adopted a pretest-posttest quasi-experimental design. The population were 60 diabetics attending medical outpatient clinic in State Hospital Ijebu-Ode and 50 diabetics attending medical outpatient clinic in State Hospital, Ijaye. Sample size was determined using total enumeration method and 54 diabetics were utilized for experimental while 47 where used for control. The researcher-developed questionnaire that was utilized to collect data on knowledge about diabetes mellitus and prevention of its complication among diabetics for pre and post-intervention. Reliability of instrument was determined using Cronbach's Alpha coefficient which was calculated to be 0.81. The training modules and checklist were also pre-tested and found suitable for the study. Data were processed through Statistical Package for Social Sciences (SPSS) version 23. Four research questions were answered using descriptive statistics of mean, standard deviation and percentages.

Findings revealedthat majority 29 (53.7%) of participants in the experimental group had low pre-intervention knowledge about diabetes mellitus while majority 22 (46.8%) in the control group had low knowledge.Majority 26 (48.2%) of participants in the experimental group had low pre-intervention knowledge about prevention of diabetes mellitus while majority 25 (53.2%)in the control group had low knowledge. Majority 29 (70.7%) of participants in the experimental group had high post-intervention knowledge about diabetes mellitus while majority 8 (43.2%) in the control group had low knowledge. Majority 26 (63.4%) of participants in the experimental group had post-intervention knowledge about prevention of diabetes mellitus while majority 19 (43.2%) in the control group had low knowledge.

In conclusion, knowledge of diabetic mellitus and prevention of complication among diabetics can be improved as participants in the experimental group showed improved knowledge about diabetes mellitus and prevention of its complication at post-intervention. It was recommended that hospitals should regularly expose diabetics to training programmes on diabetes mellitus and prevention of its complication which would improve knowledge about diabetes mellitus and prevention of its complication among diabetics.

Keywords: *Diabetes mellitus, Knowledge, Complications, Nursing Intervention, Prevention.*

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I. Introduction

Diabetes mellitus and its' complications has been an issue of great concern because of its' negative effect and severe burden on the individual, family and the society at large. Diabetes Mellitus (DM) is a chronic metabolic disorder affecting all members of the population world overcharacterized by elevated levels of blood glucose which may over time lead to serious damage to the heart, blood vessels, eyes, kidneys,It is a chronic, metabolic disease and nerves. Diabetes mellitus and its' complications has been an issue of great concern because of its' negative effect and severe burden on the individual, family and the society at large. The prevalence of diabetes has been steadily increasing in the past few decades, in particular in low- and middle-income countries and thus elevates the complications of diabetes mellitus as one of the most important current public health issues.There is scarcely any nation where the weight of Diabetes is not felt; not only on the patient concerned but including other significant people surrounding the patient.(WHO, 2016).

The World Health Organization (WHO, 2016) stated that globally, an estimated 422 million adults were living with diabetes in 2014, compared to 108 million in 1980. The global prevalence (age-standardized) of diabetes has nearly doubled since 1980, rising from 4.7% to 8.5% in the adult population. This reflects an increase in associated risk factors such as being overweight or obese. Diabetes has contributed to nearly3.7

million deaths in 2012 alone (WHO). It is further estimated that 366 million people had DM in 2011; by 2030 this would have risen to 552 million (Global burden of diabetes, 2011). The number of people with type 2 DM is increasing in every country with 80% of people with DM living in low- and middle-income countries as a result of environmental and lifestyle changes (Zimmet, Alberti& Shaw, 2016).

Today, type 2 diabetes, long considered a relatively uncommon and low-profile disease, is now a major international public health problem and one of the major health challenges of the 21st century (Chen& Zuurmond,2018). There is compelling data to show an increasing incidence and prevalence of DM in Africa. The estimated prevalence of diabetes in Africa is 1% in rural areas, and ranges from 5% to 7% in urban sub-Saharan Africa (Kengne, Amoah& Mbanya, 2015). The current prevalence of DM in Nigeria is not known but estimates may likely be in the region of 8%-10%. Type 2 DM is the commonly documented form of DM and in most endocrine clinics, it accounts for about 90%-95% of all cases of DM (Adeleke,Asani, Belonwu, Gwarzo & Farouk, 2014). Studies examining data trends within Africa point to evidence of a dramatic increase in prevalence in both rural and urban setting, and affecting both gender equally (Mbanja, 2009).It is predicted that the prevalence of DM in adults of which type 2 DM is becoming prominent will increase in the next two decades and much of the increase will occur in developing countries where it will equal or even exceed the incidence in developing nations, thus culminating in a double burden as a result of the current trend of transition from communicable to non-communicable diseases (Wild, Fischbacher &McKnight, 2016).

The choice of treatment regimen and the specific glucose-control target at a population level remains contentious (Yudkin & Montori, 2014). It is clear that an individual's failure to use prescribed medications properly contributes significantly to adverse clinical outcomes. On average, half the patients prescribed medications for diabetes discontinue therapy within 12 months of treatment initiation (Zafar,Stone, Davies&Khunti, 2015). Poorly compliant patients miss scheduled appointments for diabetes-related monitoring and treatment (Karter, Nundy, Parker, Moffet& Huang, 2014).Diabetes patients, if not strictly monitored, develop multiple chronic complications leading to irreversible disability and death.Xu, Sun, Jiao, Shi, Xie, Wang, Zhu and Ji (2016) stated that complications of diabetes range from acute, life-threatening conditions such as severe hypoglycemia or ketoacidosis to chronic, debilitating complications affecting multiple organ systems such as retinopathy, nephropathy, neuropathy and cardiovascular disease. Coronary heart disease, lower limb amputation, stroke are more common in diabetics. Micro vascular complications like diabetic nephropathy and retinopathy are severe health problems resulting in progressive worsening of the quality of life and premature death (Park, 2015).

Papatheodorou, Banach, Bekiari, Rizzo and Edmonds (2017) stated that diabetes mellitus is regarded as a global epidemic and it is representing one of the leading causes of morbidity and mortality worldwide. Diabetes mellitus can cause serious complications due to its ability to progress gradually and its chronicity. Furthermore, other complications indirectly associated with diabetes mellitus has been identified to include hypertension, heart failure, cerebrovascular accident and renal failure. Although sustained hyperglycemia is seen as a primary driver of diabetic complications, it is not the singular factor implicated in the development of diabetes. Many of these complications are exacerbated by other co-pathologies commonly occurring with diabetes, particularly high blood pressure and lipid abnormalities (International Diabetes Federation, 2015).

As such, working to prevent, detect and treat diabetes is also critical to overall human development. Within the 2030 Agenda for Sustainable Development, Governments have set an ambitious target to reduce premature mortality from non-communicable diseases [NCD]-including diabetes – by one third; achieve universal health coverage; and provide access to affordable essential medicines – all by 2030.

Preliminary data revealed that the total population of diabetics attending the Medical out-Patient Clinic at Ijebu-Ode State Hospital from January to December 2018 were 1,824.The patients presented with different complications ranging from hypoglycaemia, leg ulcer, ophthalmic and neurological problems to mention a few. Considering the enormity of complications associated with diabetes, the researcher will aim to determine if nursing education would be effective in preventing the complications of diabetes. Hence, the study assessed effect of nursing intervention on knowledge about diabetes mellitus and prevention of its complications among diabetics attending two selected state hospitals, Ogun State.

II. Methodology

Research Design: Two group pre-test, post-test quasi-experimental design was adopted to assess the effect of nursing intervention on knowledge about diabetes mellitus and prevention of complications among diabetic patients attending medical out-patient clinic at two selected State Hospitals in Ogun State.

Population: The population for the study were 60 diabetes mellitus patients attending medical outpatient clinic in Ijebu ode state hospital which was obtained from clinical records of attendance and 50 diabetes mellitus patients attending Ijaye state hospital which was also obtained from the clinical records of attendance.

Sample Size and Sampling Technique: Total enumeration method was used for the study. All diabetic patients who came to the out-patient clinic when this study was carried out were used for the study. This applied to both

the experimental and the control group. Purposeful sampling technique was used for the selection of the participants.

Instruments for Data Collection: The researcher developed self structured questionnaire derived from the literature review and adapted from Diabetes Self-Management Questionnaire (DSMQ) by Schmitt, Gahr, Hermanns, Kulzer, Huber & Haak (2013), to assess the knowledge about diabetes, its complication and how they can be prevented among the participants. The questionnaire was divided into following sections; Section-A include sociodemographic data, 2Section-B to assess the knowledge about diabetes mellitus and prevention of complications of diabetes mellitus. Knowledge score below 30% was categorized as low and 30-70% was categorised as moderate while 70%and above was categorized as high. The instrument was close-ended with Yes or No answer.

In order to ensure the content validity of the instrument, the draft of the structured instrument was presented to the researcher's supervisor for corrections which were effected; experts in the field also validated the questionnaire for face and content validity. Reliability of the instrument was determined in Ijebu-Ife state hospital using 8 respondents and split half method using Cronbach's Alpha reliability coefficient was calculated to be 0.81

Data collection procedure: A letter of introduction was collected from the Dean, School of Nursing Science, Babcock University to the Medical Directors of Ijebu-Ode State Hospital and Ijaye State Hospital, seeking for their permission and hospital's permission to carry out the study. The head of unit in outpatients of the hospitals was approached and clinical record of attendance was collected from which the participants were recruited .The cost and the benefits were explained to the respondents and arrangements were made on the day to carry out the intervention.

On the first day, the participants were exposed to pre-intervention test which was done through the administration of questionnaire to the experimental group with the help of two research assistants same was done to the control group. After the pre intervention test the participants on the experimental group were given the first training which was on knowledge about diabetes mellitus exempting the control group. Another visit was arranged with the participants on the second training which was on the prevention of complications of diabetes mellitus on the experimental group alone. The post test intervention test was conducted two weeks after the second intervention on both the experimental and the control group.

Method of Data Analysis: The completed questionnaires were collected, coded, processed and analyzed using Statistical Package for Social Sciences (SPSS) version 23, frequency tables were made and data were presented on it. Four research questions were answered using descriptive statistics of Mean, standard deviation and percentage while four hypotheses were tested using influential statistics of t-test at 0.05 level of significance.

Ethical Consideration: Ethical permission was sought and given by the Babcock University Health Research Ethical Committee (BUHREC)**.** The ethical approval and certificate number is BUHREC 303/19. The researcher was committed to strict confidentiality throughout the course of the study

III. Results

Table 1: Pre intervention participants' responses on General knowledge about diabetes

		Control Group				Experiment Group			
S/N	Knowledge	Incorrect		Correct		Incorrect		Correct	
		F	%	F	%	F	%	F	%
1	It is caused by eating too much sugar	21	44.7	26	55.3	27	50.0	27	50.0
2	Diabetes mellitus can run in the family.	5	10.6	42	89.4	4	7.4	50	92.6
3	Diabetes mellitus can be cured	11	23.4	36	76.6	48	88.9	6	11.1
4	It is a chronic condition that require long-term management and follow-up	42	89.4	5	10.6	52	96.3	2	3.7
5	Dietary modification, exercise and medications are useful in its management	46	97.9	1	2.1	52	96.3	2	3.7
6	Compliance with management will help to increase well-being and prevent complications	2	4.3	45	95.7	2	3.7	52	96.3
7	It can lead to death if it is not well managed	1	2.1	46	97.9	2	3.7	52	96.3
8	The best way to check if I have diabetes is by tasting my urine.	10	21.3	37	78.7	44	81.5	10	18.5
9	The usual cause of diabetes is lack of effective insulin in the body.	26	55.3	21	44.7	4	7.4	50	92.6
10	Diabetes is caused by failure of the kidneys to keep sugar out of the urine.	35	74.5	12	25.5	46	85.2	8	14.8
11	A fasting blood sugar level of 210mg/dl is too high.	41	87.2	6	12.8	48	88.9	6	11.1

12	Frequent urination and thirst are signs of too much sugar in the body	2	4.3	45	95.7	6	11.1	48	88.9
13	In untreated diabetes, the amount of sugar in the blood usually increases	45	95.7	2	4.3	49	90.7	5	9.3
14	Traditional healers can cure diabetes mellitus with herbs.	12	25.5	35	74.5	31	57.4	23	42.6
15	Diabetes mellitus is a disease for both the rich and poor people and it can affect anybody	5	10.6	42	89.4	3	5.6	51	94.4
16	Diabetes mellitus can be controlled.	46	97.9	1	2.1	23	42.6	31	57.4
17	There are two main types of diabetes: Type 1 (insulin-dependent) and Type 2 (non-insulin dependent).	22	46.8	25	53.2	2	3.7	52	96.3
18	Regular exercise will increase the need for insulin or other diabetic medication. allow the body to produce more insulin	21	44.7	26	55.3	44	81.5	10	18.5

Table 1 shows the response of the participants to the question on general knowledge about diabetes. At pre-intervention stage 44.7% of the participants in the control group consented that diabetes is not caused by eating too much sugar while 50% in the experimental group agreed to it.

Table 2: pre intervention mean score of knowledge of diabetes among the participants in control and experimental group

Knowledge	**Category of scores**	**Control**		**Experimental**	
		Freq.	**%**	**Freq.**	**%**
Low	1-6	22	46.8	29	53.7
Average	7-12	19	40.4	17	31.5
High	13-18	6	12.8	8	14.8
Total		47	100.0	54	100.0
Mean		7.98 (44.3%)		7.26 (40.3%)	
Standard dev.		2.41		1.53	
Maximum		11.00		11.00	
Minimum		5.00		3.00	

Table 2 presents the pre-intervention mean score of knowledge of diabetes among the participants in control and experimental group. The knowledge mean scores among diabetic patients attending medical out-patient in two state hospitals. On the general knowledge of diabetes at pre-test, it was shown that the diabetic patients in the control group had a mean score of 7.98 which is equivalent to 44.3% while those in the experimental group had a mean score 7.26 which is equivalent to 40.3%. Thus, it could be said that the diabetic patients' knowledge mean score of diabetes in both group before intervention were poor.

Table 3: Post intervention participants' responses on General knowledge about diabetes

		Control Group				**Experiment Group**			
S/N	Knowledge	**Incorrect**		**Correct**		**Incorrect**		**Correct**	
		f	**%**	**f**	**%**	**F**	**%**	**F**	**%**
1	It is caused by eating too much sugar	25	56.8	19	43.2	-	-	41	100
2	Diabetes mellitus can run in the family.	34	77.3	10	22.7	10	24.4	31	75.6
3	Diabetes mellitus can be cured	17	38.6	27	61.4	2	4.9	39	95.1
4	It is a chronic condition that require long-term management and follow-up	14	31.8	30	68.2	-	-	41	100
5	Dietary modification, exercise and medications are useful in its management	40	90.9	4	9.1	-	-	41	100
6	Compliance with management will help to increase well-being and prevent complications	25	56.8	19	43.2	-	-	41	100
7	It can lead to death if it is not well managed	2	4.5	42	95.5	-	-	41	100
8	The best way to check if I have diabetes is by tasting my urine.	1	2.3	43	97.7	-	-	41	100
9	The usual cause of diabetes is lack of effective insulin in the body.	38	86.4	6	13.6	-	-	41	100
10	Diabetes is caused by failure of the kidneys to keep sugar out of the urine.	2	4.5	42	95.5	-	-	41	100
11	A fasting blood sugar level of 210mg/dl is too high.	42	95.5	2	4.5	-	-	41	100
12	Frequent urination and thirst are signs of too much sugar in the body	38	86.4	6	13.6	3	7.3	38	92.7
13	In untreated diabetes, the amount of sugar	4	9.1	40	90.9	6	14.6	35	85.4

	in the blood usually increases								
14	Traditional healers can cure diabetes mellitus with herbs.	34	77.3	10	22.7	2	4.9	39	95.1
15	Diabetes mellitus is a disease for both the rich and poor people and it can affect anybody	17	38.6	27	61.4	2	4.9	39	95.1
16	Diabetes mellitus can be controlled.	10	22.7	34	77.3	2	4.9	39	95.1
17	There are two main types of diabetes: Type 1 (insulin-dependent) and Type 2 (non-insulin dependent).	23	52.3	21	47.7	-	-	41	100
18	Regular exercise will increase the need for insulin or other diabetic medication. allow the body to produce more insulin	32	72.7	12	27.3	-	-	41	100

Table 3 shows the response of the participants to the question on knowledge on general knowledge about diabetes. The responses show an improvement in the knowledge of the experimental group compared to the control group. For instance, all the respondents in the experimental group provided the correct answers for most of the items.

Table 4: Post-intervention mean score of knowledge of diabetes among the participants in control and experimental group

Knowledge	**Category of scores**	**Control**		**Experimental**	
		Freq.	**%**	**Freq.**	**%**
Low	1-6	19	43.2	-	-
Average	7-12	17	38.6	12	29.3
High	13-18	8	18.2	29	70.7
Total		44	100.0	41	100.0
Mean		8.17 (45.4%)		16.03 (89.1%)	
Standard dev.		2.11		1.84	
Maximum		13.00		18.00	
Minimum		5.00		9.00	

Table 4 presents the post-intervention mean score of knowledge of diabetes among the participants in control and experimental group. The knowledge mean scores among diabetic patients attending medical out-patient in two state hospitals. On the general knowledge of diabetes at post-test, it was shown that the diabetic patients in the control group had a mean score of 8.17 which is equivalent to 45.4% while those in the experimental group had a mean score 16.03 which is equivalent to 89.1%. Thus, it could be said that the diabetic patients' knowledge mean score of diabetes in the experimental group has improved better than that of the control group.

Table 5: Pre intervention of participants' responses on pre-knowledge of prevention of complications of DM

		Pre Intervention				**Post Intervention**			
S/N	**Prevention of Complications of DM**	**Incorrect**		**Correct**		**Incorrect**		**Correct**	
		F	**%**	**f**	**%**	**F**	**%**	**F**	**%**
1	Dietary management is an effective management option.	5	10.6	42	89.4	6	11.1	48	88.9
2	Diet should contain no carbohydrate at all to be effective.	10	21.3	37	78.7	44	81.5	10	18.5
3	Diet rich in fruits and vegetables are very helpful in diabetic control.	26	55.3	21	44.7	4	7.4	50	92.6
4	Taking of refined and fast foods is helpful in achieving good control	35	74.5	12	25.5	46	85.2	8	14.8
5	An insulin reaction is caused by eating too much food.	41	87.2	6	12.8	48	88.9	6	11.1
6	The way I prepare my food is as important as the foods I eat.	2	4.3	45	95.7	6	11.1	48	88.9
7	A diabetic diet consists mostly of special foods.	45	95.7	2	4.3	49	90.7	5	9.3
8	Diabetes drugs can be used to control and prevent complications	10	21.3	37	78.7	44	81.5	10	18.5
9	Drugs for diabetes treatment are taken only for a short period of time.	26	55.3	21	44.7	4	7.4	50	92.6
10	It is important to take the medications regularly and consistently.	35	74.5	12	25.5	46	85.2	8	14.8

11	I don't have to eat after taking my diabetic drugs or injections	21	44.7	26	55.3	27	50.0	27	50.0
12	Once I am taking my drugs well, I don't need to check my blood glucose level regularly	5	10.6	42	89.4	4	7.4	50	92.6
13	Medication is more important than diet and exercise to control my diabetes.	11	23.4	36	76.6	48	88.9	6	11.1
14	Once I am regular with my medications, I don't need exercise or dietary control.	42	89.4	5	10.6	52	96.3	2	3.7
15	Diabetes can cause low sugar in the body	46	97.9	1	2.1	52	96.3	2	3.7
16	Shaking and excessive sweating are symptoms of high sugar in the body	2	4.3	45	95.7	2	3.7	52	96.3
17	Diabetes can cause Diabetic Keto-acidosis.	2	4.3	45	95.7	6	11.1	48	88.9
18	Diabetes when poorly controlled can cause someone to go unconscious	45	95.7	2	4.3	49	90.7	5	9.3
19	Diabetes can cause loss of sensations and undue pain	10	21.3	37	78.7	44	81.5	10	18.5
20	Diabetes can cause kidney damage and inability to produce urine.	12	25.5	35	74.5	31	57.4	23	42.6
21	Diabetes can result in partial or complete blindness	5	10.6	42	89.4	3	5.6	51	94.4
22	Diabetes can cause Foot ulcer	42	89.4	5	10.6	52	96.3	2	3.7
23	Diabetes can cause Erectile Dysfunction	45	95.7	2	4.3	49	90.7	5	9.3
24	Cuts and abrasions on diabetics heal more slowly.	12	25.5	35	74.5	31	57.4	23	42.6
25	Diabetics should take extra care when cutting their toenails.	5	10.6	42	89.4	3	5.6	51	94.4
26	Diabetes can cause loss of feeling in my hands, fingers and feet.	46	97.9	1	2.1	23	42.6	31	57.4
27	Diabetics can take soft drinks when they develop shaking and sweating.	35	74.5	12	25.5	46	85.2	8	14.8
28	Tight elastic hose or socks are not bad for diabetics.								
29	When obesity, overweight and lack of exercise are detected earlier, diabetes can be delayed and prevented.	42	89.4	5	10.6	52	96.3	2	3.7
30	Regular and vigorous physical activity accompanied by food rich in fiber, whole grain-based diet rich in vegetables and fruits can prevent diabetic complications	12	25.5	35	74.5	31	57.4	23	42.6
31	Having regular eye and kidney checks can aid in the prevention of diabetic complications	5	10.6	42	89.4	3	5.6	51	94.4
32	Once I am regular on my medications, I don't need to come for check-ups	46	97.9	1	2.1	23	42.6	31	57.4
33	Only a doctor's consultation is required to prevent diabetic complications	2	4.3	45	95.7	6	11.1	48	88.9

Table 6: Pre-intervention mean score of knowledge on prevention of complications of DM among the participants in control and experimental group

Knowledge	**Category of scores**	**Control**		**Experimental**	
		Freq.	**%**	**Freq.**	**%**
Low	1-11	25	53.2	26	48.2
Average	12-22	16	34.0	20	37.0
High	23-33	6	12.8	8	14.8
Total		47	100.0	54	100.0
Mean	14.72 (44.61%)			14.58 (44.18%)	
Standard dev.	1.97			2.03	
Maximum	33.00			33.00	
Minimum	11.00			11.00	

Table 6 presents the pre-intervention mean score of knowledge of diabetes among the participants in control and experimental group. The knowledge mean scores among diabetic patients attending medical out-patient in two state hospitals. On the knowledge of prevention of complications of diabetes at pre-test, it was shown that the diabetic patients in the control group had a mean score of 14.72 which is equivalent to 44.61% while those in the experimental group had a mean score 14.58 which is equivalent to 44.18%. Thus, it could be said that the diabetic patients' knowledge mean score of prevention of complications of diabetes in the experimental and control group was poor.

Table 7: Post intervention of participants' responses on pre-knowledge of prevention of complications of DM

		Pre Intervention				Post Intervention			
S/N	Prevention of Complications of DM	Incorrect		Correct		Incorrect		Correct	
		F	%	F	%	F	%	F	%
1	Dietary management is an effective management option.	2	4.3	45	95.7	7	17.1	34	82.9
2	Diet should contain no carbohydrate at all to be effective.	10	21.3	37	78.7	-	-	41	100
3	Diet rich in fruits and vegetables are very helpful in diabetic control.	26	55.3	21	44.7	14	34.1	27	65.9
4	Taking of refined and fast foods is helpful in achieving good control	21	44.7	26	55.3	5	12.2	36	87.8
5	An insulin reaction is caused by eating too much food.	26	55.3	21	44.7	13	31.7	28	68.3
6	The way I prepare my food is as important as the foods I eat.	35	74.5	12	25.5	-	-	41	100
7	A diabetic diet consists mostly of special foods.	41	87.2	6	12.8	-	-	41	100
8	Diabetes drugs can be used to control and prevent complications	11	23.4	36	76.6	-	-	41	100
9	Drugs for diabetes treatment are taken only for a short period of time.	10	21.3	37	78.7	-	-	41	100
10	It is important to take the medications regularly and consistently.	45	95.7	2	4.3	-	-	41	100
11	I don't have to eat after taking my diabetic drugs or injections	35	74.5	12	25.5	9	22.0	32	78.0
12	Once I am taking my drugs well, I don't need to check my blood glucose level regularly	5	10.6	42	89.4	2	4.9	39	95.1
13	Medication is more important than diet and exercise to control my diabetes.	5	10.6	42	89.4	6	14.6	35	85.4
14	Once I am regular with my medications, I don't need exercise or dietary control.	46	97.9	1	2.1	3	7.3	38	92.7
15	Diabetes can cause low sugar in the body	42	89.4	5	10.6	2	4.9	39	95.1
16	Shaking and excessive sweating are symptoms of high sugar in the body	42	89.4	5	10.6	2	4.9	39	95.1
17	Diabetes can cause Diabetic Keto-acidosis.	12	25.5	35	74.5	-	-	41	100
18	Diabetes when poorly controlled can cause someone to go unconscious	5	10.6	42	89.4	5	12.2	36	87.8
19	Diabetes can cause loss of sensations and undue pain	46	97.9	1	2.1	5	12.2	36	87.8
20	Diabetes can cause kidney damage and inability to produce urine.	2	4.3	45	95.7	-	-	41	100
21	Diabetes can result in partial or complete blindness	2	4.3	45	95.7	-	-	41	100
22	Diabetes can cause Foot ulcer	45	95.7	2	4.3	3	7.3	38	92.7
23	Diabetes can cause Erectile Dysfunction	10	21.3	37	78.7	2	4.9	39	95.1
24	Cuts and abrasions on diabetics heal more slowly.	12	25.5	35	74.5	-	-	41	100
25	Diabetics should take extra care when cutting their toenails.	5	10.6	42	89.4	5	12.2	36	87.8
26	Diabetes can cause loss of feeling in my hands, fingers and feet.	12	25.5	35	74.5	-	-	41	100
27	Diabetics can take soft drinks when they develop shaking and sweating.	5	10.6	42	89.4	-	-	41	100
28	Tight elastic hose or socks are not bad for diabetics.	42	89.4	5	10.6	13	31.7	28	68.3
29	When obesity, overweight and lack of exercise are detected earlier, diabetes can be delayed and prevented.	45	95.7	2	4.3	-	-	41	100
30	Regular and vigorous physical activity accompanied by food rich in fiber, whole grain-based diet rich in vegetables and fruits can prevent diabetic complications	46	97.9	1	2.1	3	7.3	38	92.7
31	Having regular eye and kidney checks can aid in the prevention of diabetic complications	35	74.5	12	25.5	-	-	41	100
32	Once I am regular on my medications, I don't need to come for check-ups	2	4.3	45	95.7	-	-	41	100
33	Only a doctor's consultation is required to prevent diabetic complications	5	10.6	42	89.4	5	12.2	36	87.8

Table 8: Post-intervention mean score of knowledge on prevention of complications of DM among the participants in control and experimental group

Knowledge	Category of scores	Control		Experimental	
		Freq.	%	Freq.	%
Low	1-11	19	43.2	3	7.3
Average	12-22	15	34.1	12	29.3
High	23-33	10	22.7	26	63.4
Total		44	100.0	41	100.0
Mean	14.88 (45.09%)			28.76 (87.15%)	
Standard dev.	2.07			1.89	
Maximum	33.00			33.00	
Minimum	11.00			11.00	

Table 8 presents the post-intervention mean score of knowledge on prevention of complications of diabetes among the participants in control and experimental group. The knowledge mean scores among diabetic patients attending medical out-patient in two state hospitals. On the knowledge of prevention of complications of diabetes at post-test, it was shown that the diabetic patients in the control group had a mean score of 14.88 which is equivalent to 44.88% while those in the experimental group had a mean score 28.76 which is equivalent to 87.15%. Thus, it could be said that the diabetic patients' knowledge mean score of prevention on complications of diabetes in the experimental was improved and good after intervention compared to their counterparts in the control group, which was poor.

IV. Discussion of Findings

In the outcome of the research question measuring the pre and post mean scores of nurse-led intervention on the general knowledge of DM between the participants in the experimental and control group. Before the intervention, the results show that the general knowledge of DM between the participants in the experimental (7.26; 40.3%) and control group (7.98; 44.3%) is poor. This finding agrees with studies by Missiriya (2016), who assesses the effectiveness of demonstration on self-care management among Clients with diabetes mellitus. Assessing the level of knowledge on self-blood glucose monitoring and self-insulin injection administration among clients with diabetes mellitus in pretest showed that 87% and 93% of their participants had inadequate knowledge respectively and it was reduced to 12% and 8% in post-test. Regarding the demonstration of self-blood sugar monitoring and self-insulin injection administration practice 97% and 98% had poor practice in pretest and it was reduced to 22% and 27% in post test respectively.

After intervention in this study, the general knowledge of diabetes by the diabetic patients in the control group was 8.17 (45.4%)and those in the experimental group was 16.03 (89.1%).Therefore, there was a great improvement after intervention for the experimental study. This is supported by the findings of Kostiand Kanakari (2012), that education enhances knowledge, promotes self-management and health-related behaviour modification. Moreover, education should be consistent with individual's learning skills and psychosocial state. Diabetes knowledge reinforces after its' completion and enhance in depth understanding of the significance of check-up and follow-up. Effective education requires good communication among diabetic patients and health professionals.

The outcome of this study showed that the mean scores among diabetic patients on the knowledge of prevention of complications of diabetes at pre-test. It was shown that the diabetic patients in the control group had a mean score of 14.72 (44.61%) while the experimental group had a mean score 14.58 (44.18%). It could be said that the diabetic patients' knowledge mean score of prevention of complications of diabetes in the experimental and control group was poor.

The outcome of this study lend credence to Karaoui, Deeb, Nasser and Hallit (2018), who conducted a study on knowledge and practice of patients with diabetes mellitus in Lebanon and reported unsatisfactory knowledge and practice score among patients and consequently recommended a well-targeted interventions at improving knowledge and thus militate against the complications associated with the disease. Also, Raimi, Alebiosu, Adeleye, Balogun and Kolawole (2015), conducted a review on knowledge about diabetes mellitus and it's complications among diabetic patients in Western Nigeria and result showed inadequate knowledge about diabetes mellitus and its complications and identified diabetes education by all healthcare givers as a major tool in controlling diabetes.

The study revealed further that after the participants in experimental group exposed to nurse-led intervention in form of training their mean knowledge score on the prevention of complications of diabetes increased to 28.76 (87.15%) from 14.58 (44.18%) compared to the control group with a mean score of 14.88 (44.88%). Thus, it could be said that the diabetic patients' knowledge mean score of prevention on complications of diabetes in the experimental group was improved and good after intervention compared to their counterparts in the control group, which was poor. This finding corroborates previous studies by Fathia et al (2014), on the

effects of health education on the achievements of diabetic patients regarding control and improvement of their health status and found out that health education of diabetic patients is crucial for control of diabetes. Capacity building of diabetic health centers, strengthening diabetic patients association, and more research to study the effect of health education on diabetic patients were needed.

V. Conclusion

Nursing education must be restored and assigned importance as a fundamental work tool to assist people with DM. This is justified by all the specificities of the disease and the demands generated by them, for effective and comprehensive control that is able to prevent chronic complications. With respect to nursing, this study reveals the need for greater involvement of nurses with DM nursing education, which should be based on a dialogic and emancipatory model to guide the daily clinical practices of people with DM. The hope is that these professionals will have new outlooks that will lead them to a new order, which must include improvements in the relations and interrelations among the various professionals, who are the social actors; in addition to promoting improvements in dialogic communication in all the care and management activities involved with this care.

Nurse-led training has proven to be effective in improving the knowledge about prevention of complications among diabetic patients. This shows the needs of nursing intervention on knowledge about prevention of complications of DM in our hospitals. It also puts into perspective the value and strong need self-management among the DM patients.

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