Original Article

Primary Health Care Nurses' Competencies and Resources Availability for Diabetes Mellitus Care at Local Government Areas of Ibadan

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Abstract

Background: Diabetes Mellitus (DM) Is One Of The Non-Communicable Diseases With Increasing Prevalence In Nigeria And Its Complications Pose An Immense Public Health Burden. It Is Also A Chronic Disease That Requires Self-Care Management By The Patients To Reduce Complications. Primary Health Care Centers (Phcs) Are Usually The First Point Of Call During Illness Due To Easy Accessibility. As Such, DM Patients Could Easily Access Them For Follow-Up And Monitoring. Hence, Nurses In The Phcs Need To Be Competent So As To Provide Supportive Care To These Patients And Manage DM Emergencies Such As Hypoglycemia
Aim: To Investigate PHC Nurses' Competency On Diabetes Mellitus Care And Also To Evaluate The Material Resources Available For Care In The Community.
Design: Descriptive Cross-Sectional Design.
Method : A Total Sampling Technique Was Used And Eighty-Eight (88) Nurses Were Included In The Final Analysis And Sixty-Two (62) PHC Centres Were Visited For Resources Evaluation. Data Was Analyzed Using Descriptive Statistics Of Frequency And Percentages, With The Aid Of Using SPSS Version 20.0 And Chi-Square Test Was Used To Determine Associations Between The Variables.
Results : Overall, 58% Of The Nurses Had Adequate Knowledge Of DM. However, The Findings Of The Study, Shows Deficiency In Some Critical Areas. Approximately, Fifty-Five Percent Of The Nurses Practice Below Expected DM Skills And 48.9% Of Them Exhibited Negative Attitude Towards Care Of Patients With DM. The Study Also Revealed The Resources Needed For DM Care Such As Glucometer , Glucometer Test Strips And Teaching Aids Were Not Available At Most Phcs.
Conclusion: In Order To Further Improve The Quality Of Diabetes Management In The Community, It Is Recommended That Nurses At PHC Level Undergo In-Service Training Courses On DM Care. Furthermore, There Should Be Provision Of Essential Material Resources Needed For DM Care By The Government

Keyword: Diabetes Mellitus, Competency, Resources, PHC Nurses

Introduction

Diabetes mellitus is a major public health problem and it is now one of the most common non-communicable diseases globally (Rubin, Funnell & Peyrot, 2013). Increased blood glucose is a common effect of uncontrolled diabetes, and may over time lead to serious damage to the heart, blood vessels, eyes, kidneys and nerves (Smelter, Hinkle, Cheever & Bare, 2010). It is also a

common chronic disease which currently affects an estimated 425 million adults of the world's population (International Diabetes Federation, 2017) with incidence and prevalence rates rising rapidly across the globe (World Health Organization, 2016). Competency is operationally defined as primary healthcare nurses' knowledge, attitude and skills on diabetes mellitus care. DM is the fifth leading cause of death in the world, and because it is a group of endocrine disease and the cause is multifactorial, management modalities is a multiple approach that requires continuous assessment by healthcare professionals.

Furthermore, the Primary Health Care (PHC) System is a strategic approach of the Government of Nigeria designed to improve health at the grassroots. The secondary and tertiary level health care is expected to complement the services provided at the PHC, provide more specialized care as well as serve as a referral point. However due to the weak capacities of the health workers and poor infrastructural facilities, the quality of services provided has been inadequate and poor at the primary level. The strengthening of the primary health system is crucial to diabetes prevention, screening and treatment because it is a chronic disease which requires long-term, patient centered, community based and sustainable care. Such care can only be delivered equitably and sustainable through the primary healthcare (PHC) (Chinenye, Ogu and Korubo 2015).

Research Questions

The following are the research questions for the study:

- What is the knowledge of PHC nurses at all Local Government areas in Ibadan on diabetes mellitus?
- What is the attitude of PHC nurses towards diabetes mellitus care at all Local Government Areas in Ibadan?
- What is the level of practice of diabetes mellitus nursing skills among PHC nurses' at all Local Government Areas in Ibadan?
- What are the available resources for diabetic care at selected PHC centers?

Research Hypotheses

These are the hypotheses that were tested in this study:

- There is no significant association between availability of resources in the selected PHC centers and practice of DM nursing skills.
- There is no significant association between nurses' attitude to DM care and practice of DM nursing skills.
- There is no significant association between knowledge of DM care and attitude to DM care.

Background

Globally, an estimated 425 million adults are living with diabetes mellitus, according to the latest 2017 data from the International Diabetes Federation (IDF, 2017). The prevalence of the disease is increasing rapidly as previous 2013 estimates from the International Diabetes Federation (IDF) put the number at 381 million people. The number is projected to 629 million by 2045 (IDF, 2017). Although, DM occurs throughout the world, but it is more common (especially type 2) in developed countries. The greatest increase in prevalence is, occurring in low- and middle-income countries including in Asia and Africa (WHO, 2016). Currently it is estimated that 20 million people in Sub-Saharan Africa have diabetes and about 62% are undiagnosed. The number is expected to reach 41.4 million by 2035 (Dahiru, Aliyu & Shehu, 2016). In Nigeria, DM is the commonest endocrine metabolic disorder compared to other parts of the world, it makes up over 90% of endocrine disorders seen in the country. Also DM affects the younger population of Nigerians in the prime of their working lives and thus poses greater threat to the health of these individuals (Chinenye & Oputa, 2015).

Knowledge has been shown to influence quality of diabetes care. A study by Hargraves (2014) showed that a higher percentage of nurses in a US study had insufficient knowledge related to blood glucose monitoring and could not identify the normal range of blood glucose in healthy and diabetic people (Hargraves 2014). Furthermore, in Nigeria, Odili & Eke (2010) studied the knowledge of sampled nurses on diabetes mellitus. Their findings showed poor knowledge; especially in treatment modalities that included diet and identification of signs of acute complications of diabetes as well as proper foot care. According to Oyetunde and Famakinwa (2014) study on Nurses knowledge on the contents of diabetic patients'

education in Ondo State; a large percentage of Nigerian nurses had poor knowledge on diabetes diets, blood glucose monitoring and diabetes-related complications.

Positive attitude of nurses towards DM patients' care is necessary for successful diabetes care at all levels of healthcare in order to achieve therapeutic goals and also provide supportive care to them. Moreover, Salmeen, Saeed & Mohb (2013) reported that nurses have the lowest attitude score to diabetes care among other healthcare professional.

In addition, the RCN (Royal College of Nursing 2017) comprehensive list of competencies relating to caring for a patient with diabetes includes the following: screening, prevention and early detection of type 2 diabetes, promoting self-care, mental health, nutrition, urine monitoring, blood glucose monitoring, oral therapies, injectable therapies, identifying and treating hypoglycaemia, identifying and treating hyperglycaemia and minimizing diabetes complication. These are the expected nursing roles/skills for managing diabetic patients. However, Jansink, Weijden, Elywn and Grol (2010) discovered that nurses had deficiency in the lifestyle counseling given to diabetic patients. Likewise, Ogbera, Adeyeye, Odeniyi and Adeleye (2013) revealed that a large number of healthcare workers including nurses in south west Nigeria were not familiar with the current guidelines for the management of DM.

Nwankwo (2015) identified shortage of qualified health personnel as a major factor impeding the implementation of Diabetes Self-Management Education (DSME). Adequate resources are also important for DM care at all levels of healthcare including primary, secondary and tertiary. Also, Darkwa (2011) reported that resources were inadequate in the health facilities studied. The hospital were better equipped than the health centres and clinics. It is thus imperative to have equipment for general assessment of health and screening for complication of diabetes (Whittingstall, 2010).

As a result of rapid increase in diabetes epidemic in Nigeria, all levels of prevention and care (Primary, Secondary and Tertiary) are required to be put into the action simultaneously as over 1.5m cases of diabetes is in Nigeria (WHO,2016). In addition, patients require long term follow-up care which will be effective if PHCs are able to provide this care. The PHCs, which are located within communities, can provide follow-up care to those affected by this disease.

With the high prevalence of diabetes, the role of nurses in helping patients to control associating morbidity is becoming increasingly important especially at the primary healthcare level. Nurses in the front line including nurses in PHCs can help screen patients for early diabetes identification, recognize and initiate corrective measures for inadequate therapeutic regimens, help patients set and achieve therapeutic goals and assess diabetes-related complications as they arise. Thus the need to examine the competency of nurses and availability of resources is very crucial in order to make recommendations to the necessary stakeholders to improve DM care, if necessary.

Method

Study Design: A descriptive cross-sectional design was used to assess primary healthcare nurses' competencies and resources availability for diabetes mellitus care at selected PHCs of all local government areas of Ibadan.

Study Population: Nurses from selected PHCs of all local government areas of Ibadan were respondents for this study. From the available records there were 91 nurses at primary health care centres in Ibadan (Oyo state local government commission 2016).

Inclusion Criteria: Nurses with at least Registered Nurse Qualification.

- Nurses who consent to participate in the study.

Exclusion Criteria

All nurses who are:

- On leave
- Sick
- Not providing direct and professional nursing care

Sampling Technique: Total sampling method was used to select all nurses that gave their consent to participate in the study. There are ninety-one nurses in all local Government areas of Ibadan.

Instrument for Data Collection: Two instruments were adopted for this study: A questionnaire

consisting of the socio-demographic data and questions related to the DM knowledge, attitude and skills of primary health care nurses in the care of diabetes mellitus. The second instrument was a self -designed checklist which was used to evaluate the resources available for diabetes mellitus care.

Validity and Reliability of the Instrument: The questionnaire was subjected to face and content validity. Copies of questionnaire were given to experts in nursing and research. The Standardized questionnaires were adapted to suit local settings. The instrument was given to project supervisor in terms of clarity the necessary modification and correction were made.The structured questionnaire was subjected to a pilot study that was conducted among all (8) PHC nurses at Atiba local government area in Oyo town to evaluate the feasibility of the study. Also, the instruments were tested to know if it is suitable for data collection. These respondents did not participate in the main study. The data collected was analyzed thus the reliability coefficient (Cronbach alpha) of 0.80 was computed which was statistically acceptable for the study.

Data Collection: Data were collected from November 2017– January 2018. Copies of questionnaire was administered to all PHC nurses who met the inclusion criteria at the selected local government areas in Ibadan. Questionnaires given to respondents were retrieved after they had completed it. The researcher checked completed questionnaires at the end of each field day, to avoid incomplete data collection. The researcher also obtained information on identification of resources available for diabetes mellitus care by sighting and ensuring that the listed items are functioning using a checklist.

Data Analysis: Data was analyzed using descriptive statistics of frequency and percentages with the aid of using statistical package for social sciences (SPSS) version 20.0 and Chi-square test was used to determine associations between the variables. Results was presented in tables and charts. Statistical significance was set at p value 0.05.

Ethical consideration: The Ethical review board, Ministry of Health Oyo State approved the study. Ethical review Ref No: AD 13/479/582. All participants received oral information and also gave written consent before participating in the study.

Results

Socio-Demographic Characteristics of Participants: Eighty-eight (88) nurses participated in the study. The results of the study indicates that 42 (47.7%) of the nurses were between ages of 41 and 50 years, and 47 (53.4%) had 21 - 34 years working experience as nurses. Eighty-three (94.3%) were married, while 20 (22.7%) had Bachelor of Nursing Science (B.NSc) degree in addition to the basic General Nursing (Registered Nurse). Table 1 shows details of other socio-demographic studies.

Frequency distribution of nurses who participated in the study from each Local Government Area: Result of the study shows that Ibadan North had highest number of nurses 14 (15.9%) while Ido,Oluyole and Egbeda had the lowest number of nurses (5 nurses from each LGAs).Table 2 shows the frequency distribution of nurses in the remaining local government areas.

Nurses' responses to knowledge of diabetes mellitus care question items: Sixty-one (69.3%) of them got the definition of diabetes mellitus diet wrong, while 63 (71.6%) of the nurses did not know the best method for home glucose testing, and 24 (27.3%) of them knew treatment for low blood glucose. Furthermore, 54 (62.5%) did not know what could cause a low blood glucose level and 73.9% did not know the signs of ketoacidosis. Table 3 shows details of responses to test items on knowledge of diabetes care.

Level of knowledge on diabetes mellitus care among PHC nurses: Overall, there is an adequate knowledge of diabetes mellitus among the nurses as evidenced by a percentage of 58%. Figure 1 shows the summary of knowledge on diabetes mellitus care among the PHC nurses.

Table 1: Socio-demographic characteristics of participants (N = 88)

Socio-demographic variables	Frequency	Percent	Mean ⁇ SD
Age grade			
23-30 years	4	4.5	47yrs ⁇ 7.5
31-40 years	8	9.1	
41-50 years	42	47.7	
51-59 years	34	38.6	
Religion			
Christianity	74	84.1	
Islam	14	15.9	
Marital status			
Married	83	94.3	
Single	3	3.4	
Widowed	1	1.1	
Divorced	1	1.1	
Educational qualification			
RN	2	2.3	
RN/RM	66	75.0	
RN/BNSC	20	22.7	
Years of Experience			
1-10 years	9	10.2	21years ⁇ 8.0
11-20 years	32	36.4	
21-34 years	47	53.4	

Table 2: Frequency of nurses who participated in the study from each Local Government Area.

Local Government Areas	Frequency	Percent
Ibadan North	14	15.9
Ibadan NW	8	9.1
Ibadan NE	8	9.1
Ibadan SW	9	10.2
Ibadan SE	9	10.2
Ona- Ara	8	9.1
Akinyele	8	9.1
Ido L.G.A	5	5.7
Oluyole	5	5.7
Egbeda	5	5.7
Lagelu	9	10.2
Total	88	100.0

Table 3: Nurses' responses to knowledge of diabetes mellitus care question items

Responses				
	Correct		Incorrect	
Question items	Frequency	Percent	Frequency	Percent
Definition of DM diet	27	30.7	61	69.3
The listed food highest in carbohydrate	78	88.6	10	11.4
The listed food highest in fat	46	52.3	42	47.7
Which of the following is a "free food"?	33	37.5	55	62.5
The duration for A1C measure of the patient's average blood glucose level	9	10.2	79	89.8
Best method for home glucose testing	25	28.4	63	71.6
Effect of unsweetened fruit juice have on blood glucose	18	20.5	70	79.5
Advice given to patients for the treatment of low blood glucose	24	27.3	64	72.7
Effect of exercise on blood glucose	75	85.2	13	14.8
Effect of infection on blood glucose	59	67.0	29	33.0
Advice given to clients on the best way to take care of their feet	57	64.8	31	35.2
Eating foods lower in fat decreases the diabetic patient's risk for developing which disease?	51	58.0	37	42.0
Numbness and tingling may be symptoms of which diabetic complication:	66	75.0	22	25.0
Which of the following is usually not associated with diabetes?	73	83.0	15	17.0
Signs of ketoacidosis (DKA) include:	23	26.1	65	73.9
What should a patient with DM do if he becomes sick with 'common cold'?	32	36.4	56	63.6
If you administer an intermediate insulin to a DM patient, he/she is most likely to have a low blood glucose reaction	31	35.2	57	64.8
If a DM patient tells you he realized just before lunch that he forgot to take his insulin at breakfast. What should he do now?	54	61.4	34	38.6
Health educate patient on what to do in case of low blood glucose reaction	57	64.8	31	35.2
Cause of low blood glucose reaction	59	67.0	29	33.0
If your patient takes her morning insulin but skips breakfast, will it alter her blood glucose level?	57	64.8	31	35.2
Cause of high blood glucose	75	85.2	13	14.8
Possible cause of low blood glucose reaction	33	37.5	55	62.5

Table 4: Nurses attitude to Diabetes mellitus care

Nurses' attitude	Frequency	Percent	Mean± SD
Negative attitude (108-129)	43	48.9	
Positive attitude (130-149)	45	51.1	130.05
Total	88	100.0	

Table 5: Nurses' view on expected skills on DM care

Expected skills on DM care	Yes		No	
	Frequency	Percent	Frequency	Percent
Blood glucose monitoring	86	97.7	2	2.3
Nutritional therapy/education	86	97.7	2	2.3
Administration of medication	85	96.6	3	3.4
Teaching proper diet, exercise and lifestyle	85	96.6	3	3.4
Identifying and treating hypoglycemia	77	87.5	11	12.5
Identifying and treating hyperglycemia	75	85.2	13	14.8
Insulin administration .	77	87.5	11	12.5
Screening, prevention and early detection of DM	82	93.2	6	6.8
Minimizing diabetic complication	83	94.3	5	5.7

Table 6: Nurses level of practice of Diabetes mellitus nursing skills.

Level of practice	Frequency	Percent	Mean?SD
Below expected practice	48	54.5	
Within Expected practice	40	45.5	13.07
Total	88	100.0	

Table 7: Number of diabetic patients seen in the last three month at your PHC

No of patients	Frequency	Percent
None	39	44.3
1 - 5 patients	41	46.6
6 - 10 patients	8	9.1
Total	88	100.0

Table 8: Availability and functionality of resources for DM care in PHCs (N=62)

Essential items for DM care	Available & Functioning		Available-Not Functioning		Not available	
	N	%	N	%	N	%
Weighing scale	54	87.0	4	6.5	4	6.5
Sphygmomanometer	58	93.5	3	4.8	1	1.6
Stethoscope	60	96.8	2	3.2	-	-
Urine test strips	35	56.5	-	-	27	43.5
Glucometer	27	43.5	2	3.2	33	53.2
Test strips for Glucometer	26	41.9	-	-	36	58.1
Insulin	1	1.6	-	-	61	98.4
Insulin syringes	-	-	-	-	62	100.0
Fridge for storing Insulin	22	35.5	4	6.4	36	58.1
Finger prickers	37	59.7	-	-	25	40.3
Intravenous fluids	46	74.2	-	-	16	25.8
Teaching aids/pictures on DM	23	37.1	-	-	39	62.9
Referral forms	40	64.9	1	1.2	21	33.9

Table 9: Test of significant association between availability of resources and practice of DM nursing skills between nurses' attitude to DM care and practice of DM nursing skills and between knowledge of DM care and attitude to DM care

VARIABLES	Nurses' Practice of DM skills		X2	Df	p-value	Remark	Decision
Material resources for DM care	Below expected practice	Within Expected practice					
Poorly equipped	18 (37.5)	6(15.0)	5.569	1	0.03	S	Reject H0
Fairly equipped	30(62.5)	34(85.0)					
VARIABLES	**Nurses' Practice of DM skills**		**X2**	**Df**	**p-value**	**Remark**	**Decision**
Nurses' attitude to DM care	Below expected practice	Within Expected practice)					
Negative attitude	21(43.8)	22(55.0)	1.105	1	0.39	NS	Do not reject H0
Positive attitude	27(56.2)	18(45.0)					
VARIABLES	**Nurses' attitude to DM care**		**X2**	**Df**	**p-value**	**Remark**	**Decision**
Knowledge of DM care	Negative	Positive					
Inadequate	21(48.8)	16(35.6)	1.592	1	0.28	NS	Do not reject H0
Adequate	22(51.2)	29(64.4)					

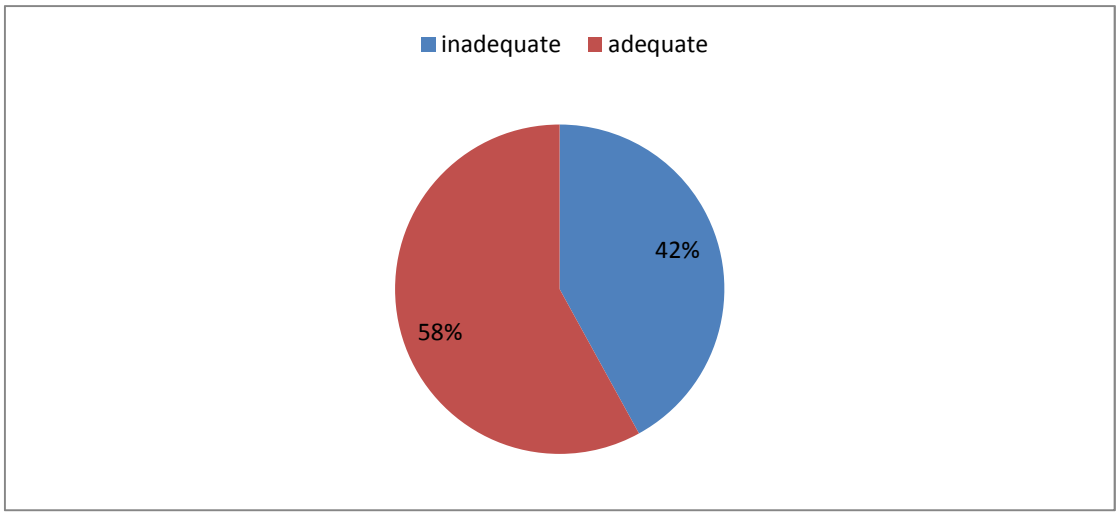

Figure 1: Level of knowledge of diabetes mellitus care among PHC nurses

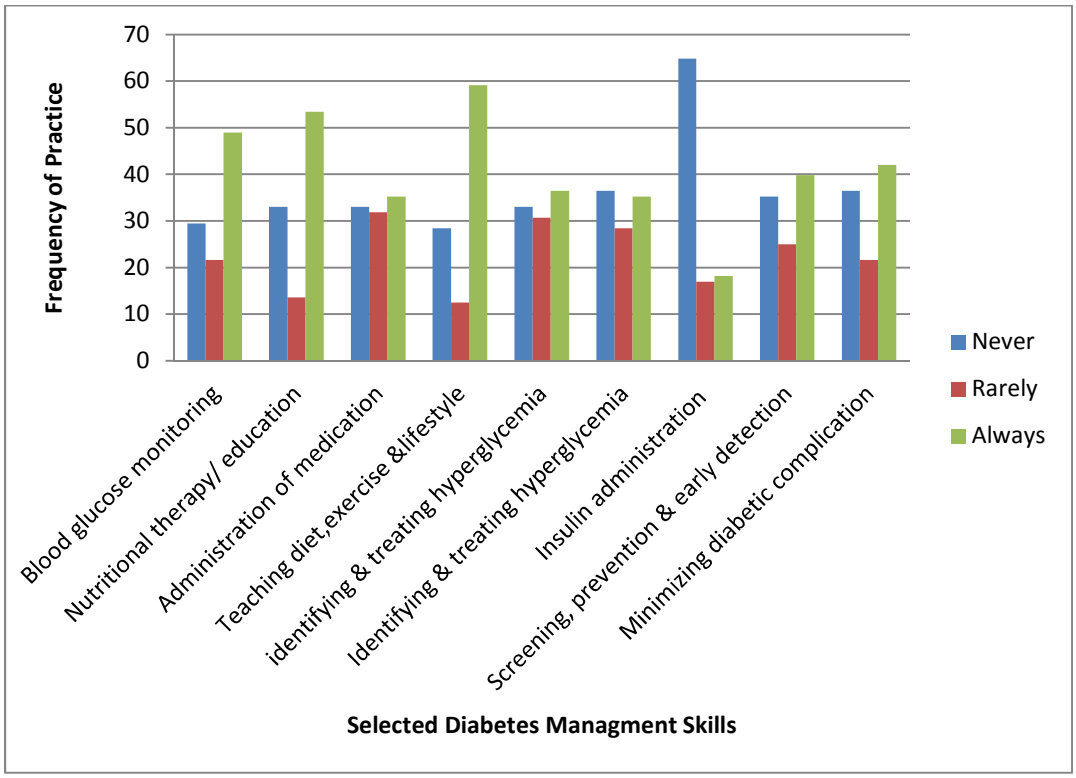

Figure 2: Frequency of PHC nurses' practice of selected diabetes management skills

Nurses view on expected skills on DM care and attitude towards Diabetes mellitus care

A total of 43 (48.9%) nurses exhibited negative attitude towards care of patients with diabetes mellitus. Table 4 shows the attitude of PHC nurses to diabetes mellitus care.Results from the study indicate that 86 (97.7%) of the nurses agreed that blood glucose monitoring is one of the expected skills for DM care. 85 (96.6%), 77 (87.5%) of them also agreed that nutrition administration and Insulin administration, respectively are expected skills on DM care. However, 13 (14.8%) of them disagreed that identification and treatment of hyperglycemia is part of the expected skills on DM care. Table 5 shows details of nurses' response to questions on the expected skill that nurses are supposed to have about diabetes mellitus care.Furthermore, study indicates that a large proportion of the nurses, 64.8% had never practiced insulin administration. A large proportion of the nurses, 36.4% had never identified or treated hyperglycemia. Figure 2 shows details of the frequency of DM skills practiced by the PHC nurses'.

Nurses level of practice of Diabetes mellitus nursing skills: Results from the study indicate that 54.5% of nurses practiced below the expected level of Diabetes mellitus nursing skills while 45.5 % practiced within the expected level of diabetes mellitus nursing skills. Table 6 shows details of level of practice of DM nursing skills among nurses at selected PHCs.

Number of diabetic patients seen in the last three month at your PHC: Result from the study indicates that 46.6% of the nurses has seen 1-5 DM patients while 9.1% of them have seen 6-10 patients in the last three month at the selected PHCs. Table 7 shows details of number of diabetic patients seen in the last three month at the selected PHCs.

Availability and functionality of resources for DM care: Results from the study indicate that Insulin and Insulin syringes were not available at 98.4% and 100% of the PHCs respectively. Also, glucometer, glucometer test strips and teaching aids were not available at 53.2%, 58.1% and 62.9% of the PHCs respectively. Refrigerators for storing were only available and functioning in 35.5% of the PHCs. Table 8 shows the details of availability and functionality of resources for DM care at the primary health care centres.

Hypotheses Testing: H01: There is no significant association between availability of resources and practice of DM nursing skills.The findings of the study show that nurses who worked in PHCs that were fairly equipped with essential material resources needed for diabetes care were able to practice DM nursing skills more than nurses who worked in PHCs that were poorly equipped with essential material resources. This was found to be statistically significant; $pv < 0.05$ (Table 9).

H02: There is no significant association between nurses' attitude to DM care and practice of DM nursing skills.The findings of the study show that nurses' attitude to DM care did not significantly influence the practice of DM nursing skills; $pv > 0.05$ (Table 10).

H03: There is no significant association between knowledge of DM care and attitude to DM care.Similarly, the findings of the study show that nurses' knowledge of DM care did not significantly influence their attitude to the DM care; $pv > 0.05$ (Table 11)

Discussion

Knowledge of PHC nurses on diabetes mellitus at Local Government Areas in Ibadan

The findings from the current study, places nurses at average level in the overall knowledge of diabetes mellitus 58%. The study also revealed deficiencies in some critical areas such as definition of diabetes mellitus diet, best method for home glucose monitoring, causes of low blood glucose and signs of ketoacidosis.Findings from past studies by Egwuda, Igbudu, Enahoro and Rufus 2015, in Niger-Delta region of Nigeria, and Tripoli reported that overall nurses' knowledge on diabetes mellitus was adequate. The report concluded that nurses are knowledgeable enough to play an important role in diabetes health education and public awareness. The study showed that the overall understanding of nurses about diabetes mellitus is above average and therefore adequate. These findings is in congruence with findings from the current study. This study, highlighted inadequacy of knowledge, 69.3% about the definition of diabetes mellitus diet, and lack of knowledge, 71.6%, about the best method

for home glucose testing as what entailed a lack of current knowledge about certain aspects of diabetes care. The findings of this study was in consonance with the study conducted by Victor et al (2015) where nurses knowledge on nutritional management of diabetes was poor. Furthermore, Oyetunde and Famakinwa (2014) also reported that nurses had a poor knowledge of diabetes diet. Findings from this study also revealed that only 26.1% of nurses could correctly answer questions regarding signs of ketoacidosis. These findings coincides with findings from a study by Unadike and Etukuma in 2010, who reported that nurses in Nigeria failed to identify the different types of insulin or signs and symptoms of diabetic ketoacidosis and in agreement with the findings of Hu, Yang, Chuang and Liu (2017) where only 9.8% of the respondents had good knowledge of checking symptoms of ketoacidosis. Also, Abduelkarem and El-shareif (2013) discovered that 48.5% of nurses lack knowledge of diabetes particularly in the area of diabetic ketoacidosis.There is therefore a great need for nurses to get proper education about the etiology of diabetes mellitus, management of patients with diabetes, and recognition of the signs and symptoms of hyperglycemia. They should also be educated about the skills involved in caring for patients with diabetes, complications of the disease, and as well should be provided with appropriate equipment to take care of the patients especially in the primary health care centres.

A**ttitude of PHC nurses towards diabetes mellitus care at all Local Government areas in Ibadan:** The findings from this study indicated that more than half (51.1%) of the nurses had a high attitude score towards diabetes care. It however, also highlighted the fact that a good number of the nurses, 48.9% still had a negative attitude towards diabetes care.A study conducted by Salmeen, Saeed and Mohb in 2013, which assessed the attitude of healthcare professionals towards diabetes care in Mukalla Yemen, found out that healthcare professionals had relatively adequate attitude towards diabetes care. However, nurses had the lowest attitude score among healthcare professional groups. This finding conflicts with findings from this study, which indicated that more than half (51.1%) of the nurses had a high attitude score towards diabetes care and Odili and Oparah (2012) reported that nurses had the lowest mean attitude scores among other health care professionals in all subscales. This presents a need for nurses to be educated about the signs and symptoms of diabetes, and encouraged to have a positive attitude towards patients with diabetes, as that will go a long way in ensuring that patients are properly cared for.

Level of practice of DM nursing skills among PHC nurses at Local Government areas of Ibadan: Findings from this study revealed that only 35.2% of nurses responded that they could identify and treat hyperglycemia. This is in agreement with findings from a study by Waheed (2017), where only 25% of the nurses were able to identify causes, signs and symptoms of hyperglycemia. Also study by Hu, Yang, Chuang and Liu 2017 supported findings from this study by reporting that only 9.8% of the nurses could correctly answer questions regarding signs and symptoms of hyperglycemia. The findings of this study also revealed that larger percentage of nurses (54.5%) practice below expected DM skills.Responses to practice showed that 48.9% of nurses always carry out blood glucose monitoring in the studied primary healthcare centers while 51.1% of them barely practice it. Furthermore study by Gerard, Griffin and Fitzpatrick 2010 & Oyetunde and Famakinwa 2014 supported findings from this study by reporting that nurses lacked skills in blood glucose monitoring). In Nigeria ,75.1% of practice nurses had similar knowledge deficits (Oyetunde and Famakinwa 2014).Thirty percent (30%) of nurses in a pilot study and 33% of cardiovascular nurses in a US study had insufficient knowledge related to blood glucose monitoring and could not identify the normal range of blood glucose in healthy and diabetic people (Smide, 2013 & Hargraves 2014).

Evaluation of resources available for diabetic care at all local Government areas' PHC in Ibadan: In addition, Whittingstall 2010, identified that one of the main components of diabetes care is the general assessment of health and the screening for complications, so it is imperative to have the equipment to do this. However, results from this study indicate that glucometer, glucometer test strips, and teaching aids were not available at 53.2%, 58.1% and 62.9% of the PHC's respectively. Findings from this study is in

consistent with findings from a study by Darkwa (2011) where resources are inadequate in the health facilities studied, the hospitals were better equipped to manage diabetes than the health centers and the clinic. This is a very appalling situation as these equipment are pertinent to adequate blood glucose monitoring especially in the PHC's. There is therefore a need for the government to address health needs at the grass root level, in order to properly care for patients with diabetes, as diabetes is a chronic disease, and thus requires long term management in the community.

Implication for further study

- Research can also be carried out to identify factors impeding or militating against nurses' ability to provide skilled diabetes care to patients.
- An observational study can be carried out to assess practice of diabetes mellitus skills rather than a self-reported practice.
- Furthermore, study can identify factors associated with nurses' diabetes care knowledge and instrument such as diabetes awareness questionnaire (DAQ) can be used to assess knowledge of evidenced based practices in caring for patient with diabetes mellitus.

Strengths and weaknesses of the study: A strength of the study was that the researcher was able to evaluate the resources available for diabetes mellitus care to find out if there is a relationship between availability of material resources and practice of diabetes mellitus care. A weakness of the study was the difficulty in retrieving accurate data on the number of nurses in each Local government areas of Ibadan, because there was disparity in the data presented by the ministry of health with the actual number of nurses on the field. Also, primary healthcare centers in Ibadan is desperately short- staffed. The nurses had little or no time for research work due to heavy workload which prolonged the period of data collection.

Conclusion: Nurses at the primary health care centres are very crucial to the survival of the health care system in Nigeria. They are the first point of call for patients in the community. There is therefore a need to ensure that the services rendered at the grass root level is standard. Nurses at the grass root level need to be provided with adequate channels to gain more, new and current information about diabetes care especially. They also need to have enough skills and the right attitude to work in order to properly render services to patients at different levels. The government also has a big role to play, by ensuring that the right equipment is provided at the primary health care centres, in order to ensure continuity of care to the patients.

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