



### Keywords

Diabetes Complications,  
Diabetes Mellitus,  
Polydipsia and Polyuria

Received: April 07, 2014

Revised: May 04, 2014

Accepted: May 05, 2014

## Community participation in the prevention of diabetes complications in south-east, Nigeria

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### Citation

Nwaokoro Joakin Chidozie, Oputa Reginald N., Ede Alison Okorie, Emerole Chima O., Nwufu Regina C., Nwawume I. Chukwuma. Community Participation in the Prevention of Diabetes Complications in South-East, Nigeria. *American Journal of Science and Technology*. Vol. 1, No. 2, 2014, pp. 69-76.

### Abstract

Background: Diabetes is a major public health problem in our society particularly in Uratta in Imo state, Nigeria. The impact of rapid urbanization, industrialization and lifestyle changes has led to an increasing trend in prevalence of diabetes and its associated complications such as neuropathy, nephropathy, vascular disease (cardiac, cerebral and peripheral) and retinopathy. Objectives: To determine the level of knowledge of preventive measures of diabetes complications among the people of the study community. Method: This study was done in Uratta, Owerri North Local Government Area of Imo State, Nigeria. Data were assessed from four health care facilities through balloting method. Data was collected using a standard structured questionnaire adopted from National Health Survey with three sections on demography, knowledge from diagnosis and diabetes. The data collected were entered into a computer database by statistician using SPSS (software package for social science). The Data were analyzed and presented using descriptive measures (such as frequency, percentages and figures). Results: Overall management of diabetes, 8(4%) said with tablets, 112(56%) said with diet, 25(12.5%) used physical activity and 55(27.5%) said with insulin. Conclusion: In conclusion, the increasing diabetes mortality and lack of control among diagnosed patients make quality of treatment a major concern in this study where complications of diabetes are common. Urgent measures are needed to prevent diabetes and its complications. All efforts must gear towards behavior change amongst people with diabetes and care support systems should also be encouraged.

## 1. Introduction

Diabetes is a chronic metabolic disorder that has been recognized as a disease since ancient times. The word diabetes is a Greek name which means “to run through”. It is a disease in which the body does not produce or respond properly to insulin, a hormone that is essential for controlling of levels of glucose or a disease in which the body cannot produce insulin, a hormone produced by the pancreas, controls the blood glucose level by regulating the production and storage of glucose (Emeharole, 2008). Diabetes is a disease in which the blood sugar is elevated (or too high). Diabetes is an umbrella term for a number of metabolic diseases that affects the body’s ability to control blood glucose levels. Diabetes has a considerable impact on the income and health resources of any nation. The impacts of diabetes on individual lives have subdued hopes and vigor to pursue meaningful goals in life. As a chronic condition, it places immense burden and untold hardship to people with diabetes and families (Nwaokoro et al, 2014). Almost all older adults according to World Health Organization, (WHO, 2006) who develop this disease have what is called “Type 2” diabetes. Type 2 diabetes occurs because the body cannot properly use the insulin it makes (called insulin resistance). Also the body cannot produce enough insulin to overcome the body’s resistance to insulin. Insulin is a hormone that converts sugar, starches and other food into energy for daily life. It is a hormone that helps regulate blood sugar (Graber et al, 2002). Among all the patients suffering from diabetes, type 2 has about 90% of such cases. In diabetes there may be a decrease in the body’s ability to respond to insulin or a decrease in the insulin produced by the pancreas which leads to abnormalities in the metabolism of carbohydrates, proteins and fats. The resulting hyperglycemia may lead to acute metabolic complications including ketoacidosis and in the long term contribute to chronic micro-vascular complications. According to Balducci et al; (2006), stated diabetes mellitus as a complex, chronic disorder characterized by disruption of normal carbohydrates, fat and protein metabolism and the development over time of micro-vascular and macro-vascular complications and neuropathies.

## 2. Diagnosis of Diabetes

It is important to diagnose diabetes as early as possible so that treatment can commence. People in high risk groups need to be screened for undiagnosed diabetes. A three-step screening and diagnosis procedure is recommended for detecting undiagnosed diabetes:

- Initial risk assessment using a risk assessment tool or risk factors
- Measurement of fasting plasma glucose
- Sometimes an oral glucose tolerance test (OGTT).

Diagnosis must be confirmed on a subsequent day unless unequivocal hyperglycaemia with acute metabolic

decompensation or obvious symptoms is present. The OGTT is unnecessary to diagnose diabetes in people with an unequivocally elevated fasting or random plasma glucose. An OGTT needs to be performed in a person with an equivocal result. The test is carried out after an overnight fast, following three days of adequate carbohydrate intake (greater than 150 g per day). A 75 g load of oral glucose is given and the diagnosis of diabetes can be made if venous plasma glucose level fasting is  $\geq 7.0$  mmol/L or 2-hour post glucose load is  $\geq 11.1$  mmol/L. Capillary blood glucose measurement using a desktop meter may be used for testing for undiagnosed diabetes as long as it is confirmed by venous plasma measurement. Urine testing is not sufficiently sensitive or specific as a screening test for undiagnosed diabetes (Peter et al, 2011/2012).

## 3. Complications of Diabetes

When diabetes is not treated, it can lead to many different health problem and large amounts of glucose can damage blood vessels, nerves and organs. Even a mildly raised glucose level that does not cause any symptoms can have damaging effects in the long term such as heart disease and stroke. Diabetic patients are more likely to have heart disease and a stroke than someone without diabetes. Prolonged, poorly controlled blood glucose levels increase the likelihood of atherosclerosis (furring and narrowing of the blood vessels). This may result in poor blood supply to the heart, causing angina. It also increases the chance that a blood vessel in heart or brain will become completely blocked, causing a heart attack or stroke (Balducci, et al; 2006).

Cardiovascular disease: The term cardiovascular disease (CVD) includes heart disease, stroke and all other diseases of the heart and circulation, such as hardening and narrowing of the arteries supplying blood to the legs, which is known as peripheral vascular disease (PVD). However, heart disease and stroke are the two most common forms of CVD. The damage of CVD to the main blood vessels and is involved with ‘hardening of the arteries’ (atherosclerosis) and heart disease (Cocheri, et al; 2007). People with diabetes have an up to five-fold increased risk of CVD compared with those without diabetes. The reasons are prolonged, poorly controlled blood glucose levels, which affects the lining of the body’s arterial walls. People with type 2 diabetes also often have low HDL cholesterol and raised triglyceride levels which both increase the risk of atherosclerosis (Diabetes UK, 2006).

Foot problems: Damage to the nerves of the foot can mean that small nicks and cuts are not noticed, leading to the development of a foot ulcer. About one person in ten (10) with diabetes gets a foot ulcer, which can cause serious infection. Check your feet every day and report any changes to your doctor, nurse or podiatrist. Look out for sores and cuts that do not heal, puffiness or swelling, and

skin that feels hot to the touch. Have a foot examination at least once a year (Cavanagh, et al; 2004)

**Retinal damage:** The small blood vessels at the back of the eye (retina) become damaged. The fluid and other components from blood leak into the eye, blurring vision. As this condition progresses, new fragile blood vessels start to form (proliferation). These grow forwards and bleed into the clear jelly-like part of the eye through which we see. In addition, fibrous scar tissue may form which shrinks, tearing the retina apart. If left untreated, proliferative retinopathy can result in blindness. (Moses, et al; 2002)

**Chronic kidney failure:** The kidneys rid the body of undesirable toxins by passing blood through many tiny filtering units (glomeruli). Any small damaged on blood vessels can prevent the glomeruli from working properly. In the early stages of kidney disease small amounts of blood protein (albumin) begin to leak through into the urine. This condition is called microalbuminuria (micro-albumin-urea) and is usually the first stage of kidney disease to be detected. As the condition progresses (this may be over many years), the kidneys lose their ability to filter waste products from the blood, and more protein is leaked out. Sometimes people develop high blood pressure. If the damage becomes severe then the toxins may build up in the blood to dangerous levels (kidney failure). Then toxins need to be removed from the blood artificially by dialysis. Some patients may go on to have a kidney transplant (Brown, et al; 2005)

**Nerve damage:** Nerves allow body cells to communicate with the brain. Blood vessels supply the nerve cells with oxygen and nutrients. When these become damaged, nerves are starved and do not function properly. Electrical messages through the nerves are interfered with, or stopped altogether. Damage to nerves may lead to any of a number of problems including, Loss of sensation in the hands or feet, urinary problems such as incontinence, sexual problems such as impotence, digestive problems, dizziness, uncontrolled sweating, lack of recognition of hypos, sexual dysfunction: In men with diabetes (especially those who smoke), damage to the nerves and blood vessels can lead to erection problems. This may be treated with medication. Women with diabetes may experience a reduced sex drive, reduced pleasure from sex, lack of vaginal lubrication, reduced ability to orgasm or painful sex. Women with a lack of vaginal lubrication or painful sex may find a vaginal lubricant or water based gel helpful (Balducci et al, 2006).

Besides having higher amounts of sugar in blood of any older adults with type 2 diabetes are more likely to have higher cholesterol and triglyceride (fat) levels, erectile dysfunction, and infections that do not heal quickly which directly lead them to suffer from heart attacks, older adults with diabetes are at least twice as likely to suffer from heart attacks, stroke, and kidney failure, proper treatment of diabetes may help avoid these complication. The impact of this research is to create a possible solution so that the adverse effect will not occur, like educating them on the

dietary intake and this depends on the expose of the host community.

## 4. Methodology

This research outlines indicate the steps designed by the researchers to collect data. This includes research design, study area, Sample Size and Sampling Technique, Instrumentation for data collection procedures, Validity/Reliability of the Instrument and Method of data analysis.

### 4.1. Research Design

Research design provides the glue that holds the research work together. A design was used to structure questions and outcomes were categorized into variables designing the essential elements of diabetes complications, management and prevention.

### 4.2. Study Area

Uratta is a town in Owerri North Local Government Area of Imo State, Nigeria. Orié Uratta is the Headquarter of Owerri North; it has an area of 198 square km and a population of 175,395 at the 2006 census of Nigeria.

### 4.3. Sample Size and Sampling Technique

A total of 200 diabetic patients were assessed by the researcher through a method of random systematic sample in both public and private health care centers.

The research design technique used was a descriptive cross-sectional survey involved patients attending primary health care center, Federal Medical Center (FMC) and two private health centers within the study area. The sample size was drawn from the diabetic patients in both public health facilities and private health centre in which diabetic patients receive treatment. A random sampling technique was used to select two (2) private health diabetes centers out of four (4) in Uratta communities. The private health centers are Matter-day clinic and salvation hospital. The selected two (2) private health centers were added to two (2) public health centers which were involved in the survey such as Federal Medical Center and Umuoba health center. The entire health care centers were assessed resulted to a total of 4 health care facilities done by balloting method.

### 4.4. Instrument for Data Collection

Data was collected using a standard structured questionnaire adopted from National Health Survey with three section on socio-demography, knowledge from diagnosis and diabetic, knowledge on prevention and management of diabetics.

### 4.5. Validity/Reliability of the Instrument

The instrument was assessed for its content validity by diabetes care professionals from diabetes centers and

reviewed the questionnaire to ensure relevance and clarity of the items. The experts that certified diabetes such as diabetes educators, nurses, physicians, clarified appropriate use of terminology such as physical activity instead of exercise, nutrition, glucose monitoring, program amenities, etc in instrument.

#### 4.6. Method of Data Analysis

The data collected were entered into a computer database by statistician using software package for social science (SPSS). Data were analyzed using descriptive measures (such as frequency, percentages and figures) and it was accompanied by simple statistical tests (such as chi-square tests). The adopted confidence level of 95%, a p value of 0.05 (i.e. 5%) or less was considered to be significant.

### 5. Results

#### 5.1. Demographical Data of the Respondents

Data on demographics, in relation to diabetes knowledge and participation of patients in this study was recorded reliably within the time period. There is no missing variables observed or/variables having invalid/unknown values in this work. This was due to the good understanding of the respondents in data collection, routinely recorded in the dataset used for analysis. The majority of patients were between 45 and 55 years of age with (30%) as shown in figure 1. The age mean duration of diabetes increased significantly over the same period ( $P=0.087$ ) in table 1.

In table 1, the gender of the respondents recorded as follows; male had 75(37.5%) while female had 125(62.5%). In regards to educational level, majority of respondents were seen at tertiary level (48.5%, followed by secondary 34.5%). Primary level had 8% and no school at all recorded 9%. Service users, aged 40-50 years (35.0%) and 50-60 years (30.5%) reported that they were diagnosed first at the stated ages. Age of 20-30 years had 16(8.0%) and for those in 60 years above had (15%), there was no clear pattern with age for diabetes occurrence. In figure 2, the respondents who had been diagnosed with diabetes reported that they had received 'the right amount' of verbal information when they were first diagnosed: yes had 33.5% compared with 66.5% that said no.

During the development of the questionnaire it became clear that many people with diabetes are unsure as to whether they have Type 1 or Type 2; therefore the questionnaire included three questions to help ascertain probable diabetes type (see table 2). Respondents were asked if they had Type 1 or Type 2 diabetes; 2% said Type 1, 78% said Type 2, and 20% said that they did not know. Using the classification of probable diabetes types, 2% of respondents were classed as having Type 1 diabetes and 78% classed as having Type 2 diabetes.

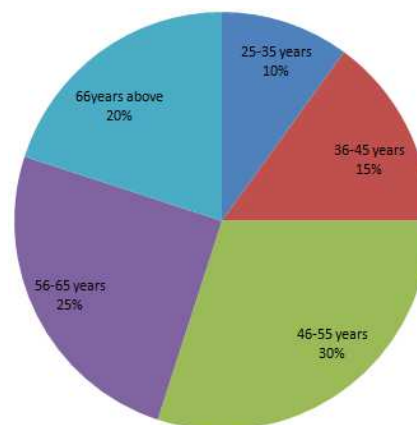
**Table 1.** Sex of the respondents.

Variables	Frequency(N=200)	Percentage (%)
Male	75	37.5
Female	125	62.5
Total	200	100.0
Educational level of the respondents		
Primary	16	8.0
Secondary	69	34.5
Tertiary	97	48.5
None	18	9.0
Total	200	100.0
Age of the diabetic patient when first diagnosed		
20-30yrs	16	8.0
30-40yrs	23	11.5
40-50yrs	70	35.0
50-60yrs	61	30.0
60-70yrs	30	15.0
Total	200	100.0

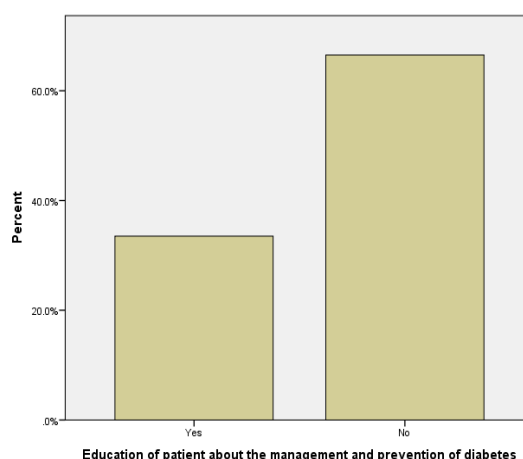
P-Value of age ( $P=0.087$ )

**Table 2.** Type of diabetes the patients were diagnosed of.

Variables	Frequency (N=200)	Percentage (%)
Type 1	4	2.0
Type 2	156	78.0
Don't know	40	20.0
Total	200	100.0



**Figure 1.** Age of the respondents.



**Figure 2.** Shows the education of patient about the management and prevention of diabetes.

### 5.2. Check-Ups for People with Diabetes

Figure 3, shows service users that were asked where they went for their diabetes check-up/treatment (i.e. an appointment at which their test results and treatment are reviewed). Overall, the majority of service users were seen at general hospital clinic 85(42.5%, compared with 55(27.5%) at their private doctor healthcare centre). There were differences according to diabetic patients that some of them attend somewhere else 33(16.5%) and those stated that they never had diabetes check-up recorded 27(13.3%).

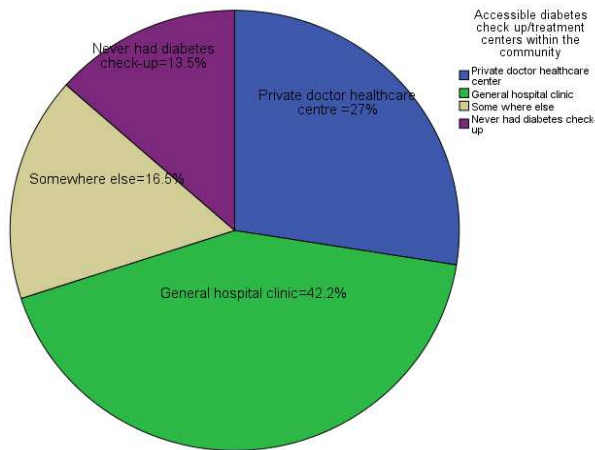


Figure 3. Shows accessible diabetes check up/ treatment centers within the community.

Most people were positive about how convenient it was for them to get to their diabetes check-up. The recorded percentage of respondents shown that they find the place where they go for their diabetes check-up very convenient as 63(31.5%); while greater patients of 72(36.0%) found it fairly convenient, 42(21%) described the location as not very convenient and not convenient at all had 23(11.5%) as seen in table 3. Respondents were asked how many times in the last 12 months they had a diabetes check-up in table 3. Thirty-seven percent said twice, 18.5% said once, 14% said three or more times, 17% said they don't know and 13.5% had not had a check-up in the last 12 months.

Figure 4, shows HbA1c test—Measures long-term or 'average' blood glucose level. This is one of the best ways to see if a person's diabetes is well managed. HbA1c test (57.5%) of respondents reported don't know, no answer from the respondents had 37.5% while yes of having done HbA1c test when diagnosed of diabetes had 5.5%.

Table 3. Check-ups for people with diabetes convenient of the diabetes to the patients.

Variables	Frequency (N=200)	Percentage (%)
Very convenient	63	31.5
Fairly convenient	72	36.0
Not convenient	42	21.0
Check-up done at home	23	11.5
Total	200	100.0
Diabetes check-up for the last 12 months		
None	27	13.5

Variables	Frequency (N=200)	Percentage (%)
Once	37	18.5
Twice	74	37.0
Three or more	28	14.0
Don't know	34	17
Total	200	100.0
Last time the patient received care from care giver and discussed alternative way to manage diabetes		
No discussion at all	36	18.0
Yes discussed about it	164	82.0
Total	200	100.0
Not given the chance to discuss the personal idea of the management		
Yes	31	15.5
No	169	84.5
Total	200	100.0
Examination of blood pressure/cholesterol for the last six month as indication of diabetes complication		
Yes	172	86.0
No	28	14.0
Total	200	100.0

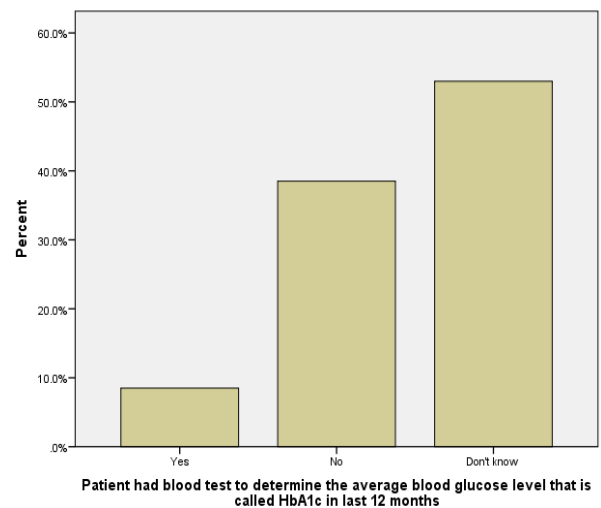


Figure 4. Shows patients had blood tests to determine the average blood glucose called HbA1c in last 12 months.

### 5.3. Involvement in Decision Making and Care Planning

The findings in table 3, suggest that respondents tended to be fare when it came to having the opportunity to discuss goals and ideas about the best way to manage their diabetes. However, given the chance to discuss medications, and to agree with appointments and care plans about the diabetes management. Just greater part 164(82%) of service users reported that they always discussed their ideas about the best way to manage their diabetes, whereas 18% reported that they did so rarely/not at all.

Respondents were asked whether they were given a chance to discuss different medications as seen in table 3. Fifteen-five percent of respondents said yes to the question asked, and larger of them said no as they were not given the chance 169(84.5%). For blood pressure/cholesterol checked in the six month as shown in table 3. Respondents were also asked whether they had received their blood

pressure/cholesterol check-up for indication of cardiovascular diseases in diabetes complication, (86%) said they had while 14% said no.

Urine test for protein- Checks for the presence of protein, to test kidney function. Diabetes is the most common cause of kidney failure. Respondents were asked what they considered to be the purpose of the urine test, (for presence of protein or glucose in urine). The test should be conducted to test for the presence of protein, to check kidney function. (25%) of the respondents said they did not know what the test was for. Twenty seven-five percent (27.5%) of respondents thought that the urine test was carried out to check for the presence of protein while 47.5% of the respondents said the urine test was for glucose as shown in table 4. In the same table 4, bare-feet-Foot complications can be a major concern for people with diabetes, particularly when glucose is poorly controlled. Forty four-five percent (44.5%) of respondents had their bare feet examined. Respondents with diabetes said don't know had (24.5%) compared to those have not had their bare feet examined (31%).

#### 5.4. Methods of Controlling Diabetes

Respondents were asked 'How do you control your diabetes nowadays?' Overall, 8(4%) said with tablets, 112(56%) said with diet, 25(12.5%) physical activity and 55(27.5%) said with insulin.

Medication use, Seventy two-five percent of service users said that they took medication for other diabetic conditions and 27.5% of the respondents said they were not taking medication for other conditions as indicated in table 4. Respondents who took medication were asked about what type of medication(s) this was seen in table 4. Forty five percent took tablets for 'high blood pressure and eye disease', 35% for 'high cholesterol', and 20% for 'heart disease'.

Table 4. Urine test for protein.

Variables	Frequency	Percentage
<b>Patients purpose of urine test Checks for the presence of protein, to test kidney function</b>		
To test for protein	55	27.5
To test for glucose	95	47.5
Don't know	50	25
Total	200	100
<b>Had of bare</b>		
Yes	89	44.5
No	62	31.0
Don't know	49	24.5
Total	200	100.0
<b>Personal knowledge and control measures of diabetes</b>		
Use of insulin	55	27.5
Use of tablets	8	4
Use of diets	112	56.0
Through physical activities	25	12.5
Total	200	100.0
<b>Use of medication for other diabetes complications</b>		
Yes	145	72
No	55	27.5
Total	200	100.0
<b>Type of medication used by the patients for other conditions</b>		
Tablets for high blood	90	45

Variables	Frequency	Percentage
<b>pressure, eye disease</b>		
Drugs for high cholesterol, kidney disease	70	35
Drug for heart disease	40	20
Total	200	100
<b>Visitation period of the patient to dietician in a year</b>		
Weekly basis	34	27
Monthly basis	78	39
Yearly basis	68	34
Total	200	100
<b>Personal knowledge about the food intake to help manage the diabetes</b>		
Yes	44	22
No	156	78
Total	200	100
<b>Advice on personal kind of food to eat</b>		
Yes	161	80.5
No	39	19.5
Total	200	100
<b>Advice on the physical activities of the patients by diabetes educators</b>		
Not at all	13	6.5
Some of the time	61	30.5
Always	125	63.0
Total	200	100.0

#### 5.5. Dietician

More than ninety percent of all respondents had seen a dietician in the table 4. Over a third 78(38.4%) of the respondents had seen a dietician in monthly basis compared with 54(27.6%) of respondents that saw a dietician on a weekly basis. Respondents on yearly basis visitation had 68(33.5%).

The findings in table 4, also suggest that people with diabetes were less likely to be provided with advice aimed at helping them to adopt a healthy lifestyle. Respondents who were asked whether they had personal knowledge on how to manage diabetes, (22%) said yes, they use their personal knowledge while no personal knowledge were (78%) and also personal advice on the kinds of food to eat were (80%) while no personal advice on the kinds of food were 20%. Levels of physical activity, respondents said always 125(63%). Those of the respondents stated not at all were 13(6.5%); some of the times according to respondents were 61(30.5%).

#### 5.6. Participation in Education or Training Courses

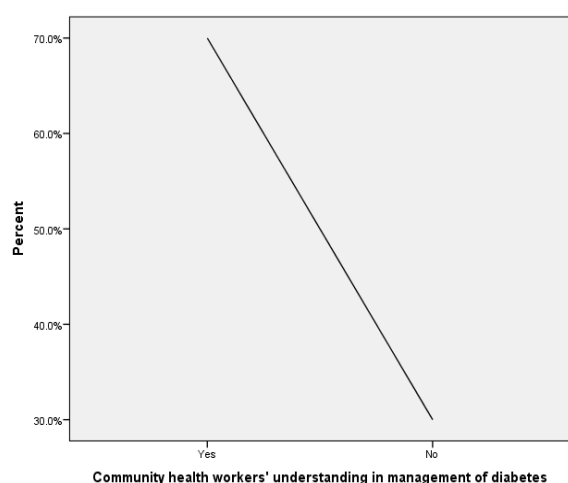
Respondents were asked a series of questions on whether they had attended an education or training course on how to help themselves in managing their diabetes when organized by community. Those who had not attended a course were asked to give reasons why they had not. Overall, 124(62%) of respondents agreed that their community do organized training program on diabetes while 38% disagreed. Respondents that said yes (55%) they had participated in an educational training course on how to manage their diabetes while 45% said no as seen in table 5. Respondents who had taken part in an educational training course on how to help manage their diabetes in either normal or

complication were asked whether their community health workers understand the training course.

**Table 5.** Participation in education or training courses.

Variables	Frequency	Percentage
Community education and training programs on the management of diabetes		
Yes	124	61.2
No	76	37.8
Total	200	100
Community involvement in provision of free medical care to diabetes		
Yes	110	55
No	90	45
Total	200	100

The majority of respondents (70%) who had attended an educational training course on how to manage their diabetes found that the course was taught in a way that it was 'very easy to understand', 30% found it 'fairly easy to understand' as seen in figure 5.



**Figure 5.** Community health workers understanding on management of diabetes.

There is a significant relationship between physical activity and occurrence of diabetes complications in the study communities ( $p < 0.000^*$ ) as table 6 shown. The results indicated significant association between food intake and occurrence of diabetes. There were no differences in the level of education between diabetic patients and diabetes complications ( $p < 0.0011^*$ ). Therefore, there is a significant relationship between education and occurrence of diabetes complications.

**Table 6.** Association between variables of interest and diabetes complications (Chi square [ $X^2$ ] and  $p$ -values).

Variables	$X^2$ values	$p$ -values
Association between level of education and diabetes complications	95.000	.0011*
Association between food intake and occurrence of diabetes complications	62.720	.000*
Association between physical activity and occurrence of diabetes complications	96.490	.003*

\*significant,  $p < 0.05$ , diabetes complications

## 6. Discussion

This study discussed the results obtained from the questionnaire survey used in obtaining information on the prevention of the diabetes complications in the study area. The study reveals that maximum number of the affected patients were between (45–55) years of age consisting of more women than men, this is as a result of changes in pattern of diet, moderate physical activities, because some of the women do not engage at all in any physical exercise, some of them gave reasons as lack of time due to their nature of work. The respondent profile consisted of more women than men (62.5% women and 37.5% men) and it was opposite of the survey's sampling frame profile (which was 55% men and 45% women) conducted by Jenny (2007). Almost half of the samples were aged 45-55 and 55-66 years or over. This age range from 40 – 50 years and 50 – 60 years were the highest age bracket diagnosed with diabetes who reported that they have not received the right amount of verbal information about the disease which may lead to complications. Unlike the younger and middle age group (20-30years) who are too conscious and had much attention on the preventive measures of diabetes. In addition, higher socio-economic status was associated with decreased physical activity and prevalence of obesity which predisposed diabetes cases. (Ahmed, et al; 2000). This seems to suggest that the fat intake differs across socio-economic and cultural groups in different states in Nigeria. The majority of people receiving treatment and check-up were seen at the general hospital clinic (42.5%) when compared to other studies done in Thailand where people visit any convenient hospital or clinic of his choice (Heisler, et al; 2003). The reason people in the study communities found general hospital clinic more preferable because of it was cheap and easy to assess because it is a government clinic where they can afford the bills compared to non government or private ones around. In respect to HbA1c test, this measures long-term or "Average" blood glucose level in the diabetic patients. It is one of the best ways to see if a person's diabetes is well managed. From the result, (67.5%) of type 2 diabetic patients reported that they have not had the HbA1c test, which indicated that respondents with diabetes have not had a good information on the HbA1c test. This proportion is similar to the estimate by Diabetes UK that up to 69% of people with diabetes has Type 2 (Jane et al, 2006).

Only small fraction of the participants had adequate HbA1c levels and the group with no access to health care had similar values of mean in HbA1c test compared to the rest of the groups. A total of (84%) of the population with HbA1c was poorly controlled and more than half of these had levels above (12%). In respect to people with different types of diabetes, majority of the respondents were diagnosed with type 2 (78%) when compared with the work done in North Africa with 90-95% of type 2 diabetes. (Kadiki et al; 2002). Use of insulin is delayed and it indicated in a small number of cases (6.8%) compared to

international standards (>20%). As would be expected, respondents with diabetes were more likely to control their diabetes with insulin (27.5%) compared with tablets, whereas those using diet were much higher than others.

There is a significant relationship between physical activity and occurrence of diabetes complications in the study communities ( $p < 0.000^*$ ). The results indicated significant association between food intake and occurrence of diabetes. There were no differences in the level of education between diabetic patients and diabetes complications ( $p < 0.0011^*$ ). Therefore, there is a significant relationship between education and occurrence of diabetes complications

## 7. Conclusion

Diabetes is an important and common health problem in Uratta Community in Owerri North L.G.A. The increasing diabetes mortality and lack of control among diagnosed patients make quality of treatment a major concern in this community, chronic complications of diabetes are common. Urgent measures are needed to prevent diabetes and its related complications.

## Recommendation

From the above findings, physical activity was recommended for those with diabetes, they should place on diet recommend by the dietician. Laboratory system should be upgraded for the adequate monitoring of patients. Research and training for the adequate treatment and control of diabetes should be increased in these key areas:-

- i. Behavior modification, adherence and motivation
- ii. Nutrition and physical activity, prescription and monitoring.

Community health care system should first assess the prevalence of diabetes and associated blindness in the community.

They should be more enlightenment on health care management by allowing research to have access to their diabetic patient through data collection.

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