Factors Influencing Attitude to Treatment among Patients with Type-2 Diabetes Mellitus in the Niger Delta, Nigeria

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Abstract: Background: Type-2 Diabetes mellitus could be well managed if patients adhere strictly to treatment regimen. Patient's attitude to treatment recommendations has been shown to influence level of adherence to treatment. This study was therefore designed to investigate factors influencing the attitude to treatment among patients with type-2 diabetes mellitus in the Niger Delta, Nigeria. **Methodology:** A cross-sectional study was conducted among 350 purposively selected patients with Type-2 diabetes mellitus. A semi-structured questionnaire was interviewer administered to obtain information on respondents' socio-demographic characteristics, attitude to medication and dietary treatment, and factors influencing adherence to treatment. Descriptive statistics, Chi-square test and logistic regression were used to analyse the data with level of significance set at 0.05. **Results:** Mean age of respondents was 57.9 ± 9.8 years, 60.9% were females and 78.0% were married. Above average of respondents exhibited good attitude to medication (65.10%) and dietary (64.0%) treatment respectively. Analysis of the determinants of poor attitude to medication treatment shows; taking many drugs to get better quickly was the major contributing variable at (OR=2.08 95% CI=1.268-3.406). Major factors influencing adherence to medication and dietary treatment includes difficulty in sticking to recommended diet, Long queues and waiting times in the clinic; Side effects from recommended drugs and the least is doctors too busy to listen to patients complaints. **Conclusion:** Taking many drugs to get better quickly and many other factors influencing the attitude to treatment recommendations remains a challenge among patients with type-2 diabetes mellitus. Thus, health education on diabetic care with emphasis on improving attitude to medication and dietary treatment regimen, among other strategies, should be organised regularly for diabetic patients.

Keywords: Attitude to treatment, Type-2 diabetes mellitus, Niger Delta

Introduction

Diabetes is a chronic disease primarily defined by high levels of glucose, giving rise to risk of tiny blood vessel damage. It is associated with reduced life expectancy, significant morbidity due to specific diabetes related microvascular complications, increased risk of macrovascular complications and diminished quality of life (1).

Diabetes is the sixth leading cause of death worldwide (2); thus it is now regarded as a global epidemic with more than 230 million people worldwide living with the disease (3). Each year, 3.2 million people around the world die from complications associated with diabetes (4). In countries with a high diabetes incidence, such as those in the Pacific and the Middle East, as many as

one in four deaths in adults aged between 35 and 64 years is due to the disease (4).

In 1901 diabetes was virtually unknown in Africa. In 2003 Africa had 7 million people with diabetes. In 2005 there were 15 million people with diabetes in Africa. In addition, in 2006 there are 10.4 million individuals with diabetes in Sub-Sahara Africa, representing 4.2% of the global population with diabetes (4). By 2025, it is estimated that this figure will increase by 80% to reach 18.7 million in this region, with a higher prevalence in the urban areas (5).

Diabetes and its complications impose significant economic consequences on individuals, families, health systems and countries (6). The threat is growing; the number of people, families and

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communities affected is increasing. This growing threat is an under-appreciated cause of poverty and hinders the economic development of many countries (6). Diabetes takes a staggering toll on the people of Nigeria and the economic burden is heavy (7).

Diabetes is one of the chronic illnesses for which self-management plays a central role in care. To optimize their health, individuals with diabetes may be advised regarding diet and exercise, frequent medical examinations, annual specialized examinations of their eyes and feet, and for many, prescribed multiple oral or injected medications every day (8). Until there is a cure for diabetes, these behaviours must be sustained for a lifetime (9).

Adherence is defined as the extent to which a person's behaviour (in terms of taking medications, following diets or executing lifestyles changes) coincides with medical or health advice (10). Adherence rates are typically higher among patients with acute conditions, as compared with those with chronic conditions; persistence among patients with chronic conditions is disappointingly low, dropping most dramatically after the first six months of therapy (11, 12, 13). For instance, approximately half of patients receiving hydroxymethylglutaryl–coenzyme A reductase inhibitor therapy will discontinue their medication within six months of starting the therapy (14).

A systematic review of adherence to medication for diabetes showed that average adherence to oral anti diabetes medications ranged from 36% to 93% (15). Expectedly, patient non adherence to prescribed hypoglycaemic medications and diet could decrease treatment effectiveness (16, 17). However, patients who report high levels of adherence to diabetes care and control have more positive attitudes towards disease management (18).

The prognosis of diabetes in sub-Saharan Africa is reported to be poor (19) and so is the quality of care (20). The observed reasons for these trends are poor clinic accessibility and drug availability, high costs of treatment and care, inadequate supplies of trained staff and equipment, as well as the use of alternative health care providers, for example traditional healers and/or herbalists (21). Furthermore, poor patient education on the management of diabetes including self-monitoring and control of glycaemia, non-adherence to treatment regimen, together with unhelpful health-related beliefs on the management of this disease have been reported to contribute to poor diabetes care and treatment outcomes (22, 23).

In view of the need to prevent or delay the development of diabetes complications, diabetic patients in a resource limited setting such as the study area should be empowered to manage their illness better by helping to determine their attitude to treatment and identify possible factors influencing adherence to treatment.

Therefore, this study was designed to investigate attitude to medication and dietary treatment and factors influencing adherence to treatment among Type-2 diabetes mellitus patients.

Methods
Study Design
A Cross sectional survey design was used for this study. The study was carried out between June and August 2011. The study is a hospital based survey which was carried out in Central hospital Warri.

Study Area
Central hospital is the largest referral hospital within the Warri metropolis. It operates out-patient diabetic clinic twice every week and has In-patient facilities where medical care is provided throughout the week. Diabetic patients, self and non-self referred from Warri and nearby towns attend the clinic on appointment days. An average of between fifty and sixty Type-2 diabetes patients used to attend the hospital per diabetes clinic day.

Study Population
The target population were all the Type-2 Diabetic patients >35 years that attended the out-patient diabetic clinic within the study period.

Sample size
An estimated sample size of 350 was calculated. Thus, 350 Type-2 diabetic patients who met the inclusion criteria were recruited for the study.

Inclusion Criteria
The inclusion criteria includes: having Type-2 diabetes mellitus, aged at least 35years, attending the diabetic clinic during the study period and giving informed consent to participate in the study.

Exclusion Criteria
Excluded from the study were: people with Type-1 diabetes mellitus, Age less than 35 years, non clinic attendants' Type-2 diabetes mellitus patients and those not giving informed consent to participate in the study.

Instrument for data collection
The study involved the use of questionnaire administered directly to patients at the site. The questionnaire was piloted among 20 Type-2 diabetes patients in another hospital. After the pilot study, some question-items in the questionnaire were

modified and reframed to ensure validity of the instrument, and facilitate patients' easy understanding when copies of the questionnaire would be finally administered to the eligible patients.

The questionnaire consisted of open and close ended questions and was designed to have three sections; the first section elucidated the socio-demographic characteristics of Type-2 diabetic patients, while the second section contained questions that assessed attitude to treatment and the third section identified factors that hindered adherence to treatment.

Reliability of the Instrument
Cronbach Alpha test Reliability was used to determine the reliability of the instrument. The Cronbach Alpha Reliability statistics gave 0.821.

The attitude to medication treatment was measured by a 14-point scale graded; partial (0-8) and strict (>8), while the attitude to dietary treatment was measured by a 4-point scale graded; partial (0-2) and strict (>2).

Data Analysis
Data generated were analysed using SPSS version 15.0. Descriptive statistics was used to evaluate frequency distribution, while Chi-square test and Logistic regression were performed to test for associations between variables of interest with level of significance set at $p < 0.05$.

Ethical Considerations
Ethical approval was obtained from Delta State Ministry of Health, Asaba.

Results
Of the three hundred and fifty respondents, 213 (60.9%) were females, while 137 (39.1%) were males. The overall mean±SD age of the respondents was 57.9±9.8. Majority, 273 (78.0%) were married while 1(0.3%) were single. Ninety-eight (28.0%) had post secondary education, 143 (40.9%) had secondary education; 75 (21.4%) had primary education and 34 (9.7%), had no formal education. The occupation section of the responses indicated that 133 (38.0%) were traders, 85 (24.3%) were Civil servant, 61 (17.4%), were either businessmen or women, and 57 (16.3%) were retiree (Table 1).

According to Table 1, Seventy-three (20.9%) of respondents from age group 55-65 exhibited good attitude to medication treatment, while the least was 10 (2.9%) from age group >75.
Furthermore, Table 1 shows that, Sixty-three (18.0%) of respondents with tertiary education exhibited good attitude to medication treatment, while the least was 21 (6.0%) with no formal education.

Table 1: Socio demographic characteristics and Attitude to medication treatment

Variable	Frequency (%) N=350	Attitude to medication treatment	
		Poor	Good
Age (Years)			
35-44	29 (8.3%)	12 (3.4%)	16 (4.6%)
45-54	104 (29.7%)	33 (9.4%)	72 (20.6%)
55-64	113 (32.3%)	40 (11.4%)	73 (20.9%)
65-74	90 (25.7%)	33 (9.4%)	57 (16.3%)
>75	14 (4.0%)	4 (1.1%)	10 (2.9%)
Sex			
Male	137 (39.1%)	46 (13.1%)	91 (26.0%)
Female	213 (60.1%)	76 (21.7%)	137 (39.1%)
Marital Status			
Single	1 (0.3%)	1 (0.3%)	0 (0.0%)
Married	273 (78.0%)	93 (26.6%)	181 (51.7%)
Widow/Widower	76 (21.7%)	28 (8.0%)	47 (13.4%)
Educational Status			
No formal education	34 (9.7%)	13 (3.7%)	21 (6.0%)
Primary education	75 (21.4%)	30 (8.6%)	45 (12.9%)
Secondary education	143 (40.9%)	25 (7.1%)	50 (14.3%)
Tertiary education	98 (28.0%)	35 (10.0%)	63 (18.0%)
Occupation			
Trader	133 (38.0%)	46 (13.1%)	87 (24.9%)
Civil servant	85 (24.3%)	30 (8.6%)	55 (15.7%)
Oil worker	8 (2.3%)	3 (0.9%)	5 (1.4%)
Retiree	57 (16.3%)	14 (4.0%)	31 (8.9%)
Bus. Men/women	61 (17.4%)	27 (7.7%)	46 (13.01%)

Pastor	3 (0.9%)	1 (0.3%)	2 (0.6%)
Farmer	2 (0.6%)	1 (0.3%)	1 (0.3%)
Housewife	1 (0.3%)	0 (0.0%)	1 (0.3%)

According to Table 2, Seventy-one (20.3%) of respondents from age group 45-54 exhibited good attitude to dietary treatment, while the least was 9 (2.6%) from age group >75.

Figure 1 shows attitude to medication treatment, 65.10% (n=228) exhibited good attitude to medication treatment and 34.90% (n=122) exhibited poor to medication treatment.
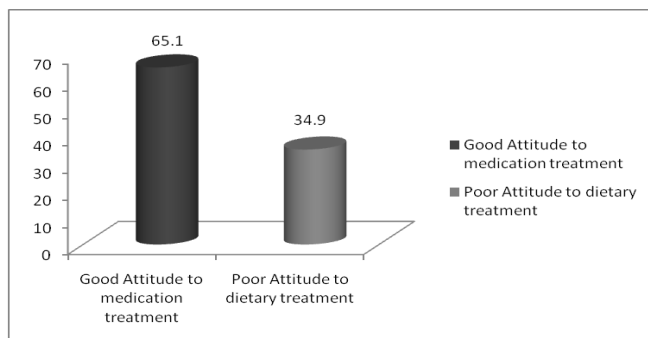

Figure 1: Attitude to Medication Treatment

Figure 2 shows the attitude to dietary treatment, 64.0% (n=224) exhibited good attitude to dietary treatment and 36.0% (n=126) exhibited poor attitude to dietary treatment.
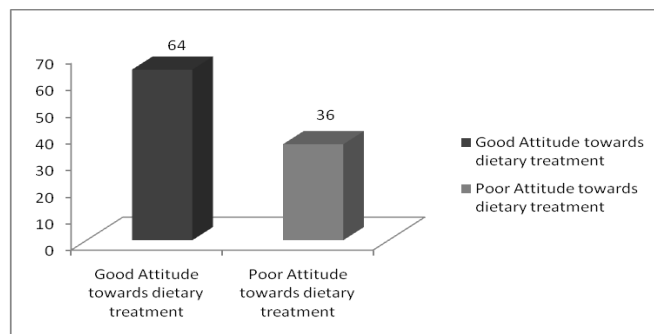

Figure 2: Attitude to Dietary Treatment

Furthermore, Table 2, shows that, ninety two (26.3%) of respondents with secondary education exhibited good attitude to dietary treatment, while the least was 22 (6.3%) with no formal education.

Table 2: Socio-demographic characteristics and Attitude to dietary treatment

Variable	Frequency (%) N=350	Attitude to dietary treatment	
		Poor	Good
Age (Years)			
35-44	29 (8.3%)	10 (2.9%)	18 (5.1%)
45-54	104 (29.7%)	34 (9.7%)	71 (20.3%)
55-64	113 (32.3%)	45 (12.9%)	68 (19.4%)
65-74	90 (25.7%)	32 (9.1%)	58 (16.6%)
>75	14 (4.0%)	5 (1.4%)	9 (2.6%)
Sex			
Male	137 (39.1%)	79 (22.6%)	90 (25.7%)
Female	213 (60.1%)	86 (20.0%)	134 (38.3%)
Marital Status			
Single	1 (0.3%)	0 (0.0%)	1 (0.3%)
Married	273 (78.0%)	97 (27.7%)	177 (50.6%)
Widow/Widower	76 (21.7%)	29 (8.3%)	46 (13.1%)
Educational Status			
No formal education	34 (9.7%)	12 (3.4%)	22 (6.3%)
Primary education	75 (21.4%)	29 (8.3%)	46 (13.1%)
Secondary education	143 (40.9%)	51 (14.6%)	92 (26.3%)
Tertiary education	98 (28.0%)	34 (9.7%)	64 (18.3%)
Occupation			
Trader	133 (38.0%)	50 (14.3%)	83 (23.7%)
Civil servant	85 (24.3%)	29 (8.3%)	56 (16.0%)
Oil worker	8 (2.3%)	3 (0.9%)	5 (1.4%)
Retiree	57 (16.3%)	15 (4.3%)	30 (8.6%)
Bus. Men/women	61 (17.4%)	26 (7.4%)	47 (13.4%)
Pastor	3 (0.9%)	2 (0.6%)	1 (0.3%)
Farmer	2 (0.6%)	1 (0.3%)	1 (0.3%)
Housewife	1 (0.3%)	0 (0.0%)	1 (0.3%)

As shown in Table 3 below, logistic regression on the determinants of poor attitude to medication treatment showed that taking many drugs to get better quickly was the major contributing variable at OR=2.08 95% CI=1.268-3.406, while the least was routine blood test not necessary if taking recommended drugs regularly OR=100.443 95% CI=15.637-645.202.

Table 3: Determinants of Poor attitude to medication treatment

Variables	df	P-Value	OR	95% CI
I like to take many drugs to get better quickly	1	0.004	2.08	1.268-3.406
It is not advisable for me to take only the drugs recommended because it is not easy to do so	1	0.000	3.047	1.857-4.999
Going to the hospital regularly for follow-up care is not necessary because I can always buy drugs from pharmacy or chemist shops when it gets finished	1	0.007	3.711	1.429-9.639
Urine test is not necessary if I take my recommended drugs regularly	1	0.001	3.954	1.723-9.072
Routine blood test is not necessary if I take recommended drugs regularly	1	0.000	100.443	15.637-645.202
Apart from the drugs prescribed at the hospital, it is good for me to use traditional/alternative medicines to treat diabetes	1	0.095	1.676	0.914-3.073
It is not compulsory for me to take diabetic drugs everyday	1	0.363	1.634	0.568-4.705

As shown in Table 4 below, logistic regression on the determinants of poor attitude to dietary treatment showed that none of the variables significantly contributed to poor attitude to dietary treatment.

Table 4: Determinants of Poor attitude to dietary treatment

Variables	df	P-value	OR
It is advisable for me to eat only the food recommended by the doctor	1	0.989	0.000
I am disposed to eating any kind of food to get better	1	0.998	0.008

As shown in table 5, major factors hindering adherence to medication and dietary treatment includes difficulty in sticking to recommended diet, Long queues and waiting times in the clinic; Side effects from recommended drugs and the least is doctors too busy to listen to patients complaints.

Table 5 Factors influencung attitude to treatment

Variables	Frequency (n=350)		
Factors hindering attitude to treatment			**Percent (%)**
Negative attitude of health staff	Yes	29	8.3
	No	321	91.7
Doctors too busy to listen to complaints	Yes	1	0.3
	No	349	99.7
Lack of availability of prescribed drugs	Yes	47	13.4
	No	303	86.6
Side effects from recommended drugs	Yes	205	58.6
	No	145	41.4
Forgetting to take prescribed drugs	Yes	53	15.1
	No	297	84.9
Use of alternative traditional medicines	Yes	127	36.3
	No	223	63.7

Lack of money for transport and purchase of drugs	Yes	39	11.1
	No	311	88.9
Long queues and waiting times in the clinic	Yes	231	66.0
	No	119	34.0
Believe in prayer to cure the disease	Yes	5	1.4
	No	345	98.6
Poor perception about the seriousness of the disease	Yes	40	11.4
	No	310	88.6
Frequent change of medications	Yes	72	20.6
	No	278	79.4
High cost of drugs	Yes	91	26.0
	No	259	74.0
Burden of ingesting or injecting drugs	Yes	199	56.9
	No	151	43.1
Difficulty in sticking only to recommended diet	Yes	242	69.1
	No	108	30.9
Recommended diet are too expensive	Yes	7	2.0
	No	343	98.0
Stigma especially when in the midst of friends	Yes	134	38.3
	No	216	61.7
Nature of job which prevents accessibility and use of drugs	Yes	15	4.3
	No	335	95.7
Poor access to information that will promote continuous use of drugs	Yes	52	14.9
	No	298	85.1

Note: Yes means it has hindered and No means it has not hindered attitude to medication and dietary treatment.

Discussion

Results showed that most of the respondents were between the ages of 55 and 64 years of age, which is similar with previous studies (24, 25). This age range might be because the study focuses on type-2 diabetes mellitus which is usually adult onset. Also, most of the respondents were females and traders which is consistent with the study location were majority of traders are females.

Demographic factors such as ethnic minority, low socio-economic status, and low levels of education have been associated with lower regimen adherence and greater diabetes-related morbidity (26). However, the study shows respondents having good attitude to treatment despite majority being in the middle and lower socio-economic class as a result of them being traders, artisans and retirees.

The results show more than half of the respondents exhibiting good attitude to medication and dietary treatment. This is similar to previous findings (27). However, this is also contrary to previous findings (28). This observed difference might be due to patients showing improved levels of adherence to diabetes care and control.

Similarly, determinants of poor attitude to medication treatment showed that taking many drugs to get better quickly was the major contributing variable. This is similar to previous findings (29, 30) where patient's

lack of belief in benefit of treatment resulted in use of other alternative drugs and medicine.

The findings shows only a small proportion of respondents believe the negative attitude of health personnel had influenced their adherence to medication and dietary treatment while some believed doctors too busy to listen to respondent's complaints had influenced their adherence to treatment. This is contrary to previous findings (29, 30). This perceived good patient-provider relationship in the study might be attributed to how respondents reverence and respect the physician and other health personnel providing medical services in the hospital. This might results to a perception that health care personnel does nothing wrong as far as providing medical services is concerned.

Ability of the respondents to adhere to treatment has been influenced by side effects from recommended drugs which is similar to previous studies (31, 24). In addition, some of the respondents believe their poor perception regarding the seriousness of the disease had an influence in their ability to adhere to treatment recommendations which is in line with previous studies (30, 31). This poor perception of the seriousness of the disease might be attributed to the slow onset of complications which can often be taken for granted by patients but can prove fatal if not given the desired attention. Only less than one quarter of respondents had lack of finance for transport to

clinic and purchase of drugs hindering their ability to adhere to treatment. This is contrary to previous findings (33, 34, 24).

Kazeem et al., (24) reported that perceived inefficiency of prescribed anti-diabetic drugs usually leads to concomitant self medication with local herbs. This is in line with the findings where almost half of the respondents said use of alternative medicines has influenced their ability to adhere to treatment. This often leads to reduction in adherence to recommended medications which is linked with increase morbidity and admission to hospital (35, 36). Most of the dietary habits of respondents were violating good dietary advice as shown where more than half of the respondents said they find it difficult to adhere to recommended diet, thus hindering their adherence to treatment. This difficulty in adhering to recommended diet might be attributed to lack of proper dietary guidelines and where available some of the patients are illiterates requiring guidelines to be memorized or the constant support of literate relatives.

More than half of the respondents believe dissatisfaction with having to ingest or inject medications on a daily basis has influenced their ability to adhere to treatment which is similar to previous findings (37). Some of the respondents think forgetting to use drugs, stigma, especially when in the midst of friends and nature of job which prevents accessibility and use of drugs has hindered their ability to adhere with treatment. These findings are in line with the studies that reported forgetfulness and spontaneous activities (38).

Conclusion
The findings shows poor attitude treatment such as non-adherence to medication and many other factors hindering attitude to treatment recommendations remains a challenge among patients with type-2 diabetes mellitus. The implication of these is difficulty in controlling their sugar level, reduced life expectancy, significant morbidity due to specific diabetes related microvascular complications, increased risk of macrovascular complications and diminished quality of life   Thus, health education on diabetic care with emphasis on improving attitude to medication and dietary treatment regimen, among other strategies, should be organised regularly for diabetic patients.

Competing Interests
The authors declare that they have no competing interests

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