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# Assessment of Medication Behaviors on Adherence to Diabetic Treatment in Tertiary Hospitals in Imo State

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## Abstract
Adherence in anti-diabetic medication results in optimal blood sugar control with less complications and reduced mortality rate. Non adherence to diabetic treatment regime among people with diabetes is possibly the most common reason for poor health outcomes. The sample consists of 144 from a population of 1996, using a convenient sampling technique. The instrument used had 27 items. The data collected were analyzed using inferential statistics. On factors associated with non-adherence and influence of socio demographic variables on adherence to diabetic treatment, the grand mean scores are 3.49 and 3.33 respectively. In conclusion the results shows that socio demographic variables and other factors like high cost of drugs, forgetfulness, unclear administration instruction, side effects of drugs, long hospital waiting hours and complexity of dosage regime among others are factors responsible for non-adherence to diabetic treatments

***Keywords****: medication behaviors, adherence to diabetic treatment, tertiary hospitals*

## Introduction
Diabetes mellitus is undoubtedly one of the fastest growing public health problems worldwide. According to the International Diabetes Federation (IDF), there were 415million people living with diabetes in 2015, with a projected 642 by 2040.[1] Diabetes was previously known, is not a disease of the rich, given a that about 77% of the global burden is in low and income countries (LMIC), also significantly affecting rural and low socioeconomic populations.[2] The prevalence of type 2 diabetes is increasing globally and has become a serious public health problem.[3] The worldwide prevalence of type 2 diabetes is predicted to rise from 425 million people in 2017 to 629 million people by 2045.[4] Furthermore, diabetes is presently among the 5 highest causes of death in most high-income countries; it resulted in 4.6 million deaths internationally in 2011.[5] Half of patients with type 2 diabetes fail to achieve adequate glycemic control.[6] Non or poor adherence to treatment regimens is a complex problem, especially for those with chronic illnesses, and it is undermining the advantages of medical care considerably.[7] Non adherence to treatment recommendations among diabetes patients typically results in suboptimal glycemic control.[8] However, poor glycemic control has been found to be associated with increasing risk of micro- and macro-vascular complications, disease progression, morbidity and mortality with increasing costs of care.[9]

## Research Methods

**Research Design**

A descriptive survey design was used to examine adherence to diabetic treatment and factors associated with non-adherence among patients receiving treatment in tertiary hospitals within Imo state.

**Study Area**

The study was done in Tertiary hospitals within Imo state which include Federal Medical Center Owerri, Imo state university teaching hospital Orlu and Imo state Specialist hospital Umuguma in New Owerri.

**Target population**

All the diabetic patients receiving treatment at the federal medical center Owerri, Imo state teaching hospital Orlu, and Specialist hospital Umuguma in New Owerri constituted the target population. The available population at the time of study was 1996 [source: Administrative records of the hospital from June 2019 to June 2020]. Federal medical center is 1000, Umuguma specialist hospital is 696 and Imo state university teaching hospital is 300.

**Sample size and sample technique**

In this study, Taro Yamanne [1969] statistical formula was used to calculate the sample size from population of 1996 diabetic patients that attended the 3 selected tertiary hospitals in Imo state for a period of twelve (12) months from June 2019 to June 2020. Thus, finding the average number of patients attending each of the hospitals per month is:

Federal medical center: 1000/12 = 83.3.

Umuguma specialist hospital: 696/12= 58

Imo state university teaching hospital: 300/ 12= 25.

The statistical formula is expressed thus:

$n = \frac{N}{1+N(e)^2}$.

Where:

n = the sample size required

N = the total known population of the study

e = level of significance [or limit of tolerable error] =0.05

1= Unit [a constant]

Therefore,

$n = \frac{N}{1+N(e)^2}$

Federal medical center Owerri = 1000

Imo state university teaching hospital Orlu = 300

Umuguma Specialist hospital = 696

The population of the study = 1996

Therefore to determine the sample size using Taro Yamanne's formula, it will be as follows;

For federal medical center:

$n = \frac{83}{1+83[0.05]^2}$

$n = \frac{83}{1+83 \times 0.0025}$

$n = \frac{83}{1+0.2075}$

$n = \frac{83}{}$

1.2075
n = 68.7 approximately 69.
For Umuguma specialist hospital
58/1+58(0.0025)
58/1+0.145
n =58/1.145 = 50.6 approximately 51
and for Imo state university teaching hospital:
25/1+25 (0.0025)
25/1+0.0625
25/1.0625 = 23.5
n = 23.5 approximately 24.
Therefore; 69+ 24 + 51 = 144.
n = 144 respondents.
This shows that for a population of 1996 the sample will be 144
The population of the study is 1996 and the sample size is 144.

**Instrument for data collection**

Questionnaire designed to suit the objectives of the study was the only method of data collection for this study. The questionnaire was drawn strictly on extensive literature search on adherence and factors influencing non- adherence to diabetic treatment and the stated objectives. The respondents are given list of predetermined responses to choose their answers. The questions are close ended survey questions and a structured Likert Scale inclusive.

The questionnaire was divided into three sections: section "A", section "B" section |C," section D" and section E.

Section A; consist of questions on social demographic characteristics of the respondents.

Section B: A 4 item questionnaire on the knowledge level of patients towards adherence to diabetic treatment in selected tertiary hospitals in Imo state.

Section C: 11 item questionnaires on Patient's opinion on reasons that prevent optimal medication adherence.

Section D: A 4 item questionnaire on socio demographic variables influencing adherence to diabetic treatment among patients attending selected tertiary hospitals in Imo state and

Section E: 8 item Morisky adherence scale on assessing patient's adherence level towards anti diabetic medications.

Each question has close and open-ended question that allows the respondents to give responses that describes their disposition on the issue.

**Procedure for data collection**

With the ethical approval and letter of introduction from the head of department of nursing sciences an administrative permit was obtained from the chief medical directors and the ward heads before data collection. The researcher with the assistant of two research assistants who were instructed on the purpose of the study and how to administer the instrument visited the three selected tertiary hospitals in Imo state on their respective clinic days and administered the questionnaires after obtaining consent from the sample respondents who were willing to participate in the study. The

questionnaires were collected the same day. This ensured a 100 percent return. Data collection lasted for a period of 6 weeks.

A period of 2weeks at each hospital.

**Method of Data Analysis**

Data generated from this research instrument was analyzed using descriptive and inferential statistics. Descriptive statistics like percentages, standard deviation and mean. The 4point Likert scale was used to analyze the attitudinal questions in computing the responses from the sample patients of the selected three tertiary hospital in Imo state. The four scales used to calculate the mean is as follows;

Strongly agree – 4 points
Agree – 3 points
Disagree – 2 points
Strongly disagree – 1 point
Total points – 10 points
Ground mean = 10/4 = 2.5

The mean value is 2.5 which were used as mean decision points. Therefore, the researchers will approximate all responses from 2.5 and above as positive responses while below 2.5 are negative responses to the questionnaire. The mean scores will then be used to analyze the various research questions.

The mean value is 2.5 which will be used as mean decision point.

A mean score of 2.5 and above will be accepted as positive while less than 2.5 will be accepted as negative response for the items.

Chi square will be used for determining the relationship between social-demographic and adherence to diabetic treatment at significant level of 0.05.

**Ethical consideration**

Ethical approval was obtained from health research ethics committee of Imo state university teaching hospital Orlu, Federal medical center Owerri and Specialist hospital Umuguma. Informed consent was equally obtained from the respondents and they were assured of confidentiality, privacy and anonymity.

**Results**

**Table 1: Reasons for non-adherence in relation to their medication taking behaviors or adherence to diabetic treatment**

| S/N | QUESTIONNAIRE ITEM | SA | A | D | SD | $\Sigma_{fx}/_{N}$ | $\tilde{x}$ |
|---|---|---|---|---|---|---|---|
| 1. | Cost of medication is too expensive | 50(34.7%)<br>240 | 65(45.1%)<br>192 | 18(12.5%)<br>30 | 11(7.6%)<br>5 | $\frac{442}{144}$ | 3.10 |
| 2. | Complexity of dosage regime | 60(41.7%)<br>240 | 64(44.4%)<br>192 | 15(10.4%)<br>30 | 5(3.5%)<br>5 | $\frac{467}{144}$ | 3.24 |
| 3. | Lack of trust in the efficiency of medication | 53(36.8%)<br>212 | 57(35.4%)<br>153 | 24(16.7%)<br>48 | 16(11.1%)<br>16 | $\frac{429}{144}$ | 2.97 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 4. | Forgetfulness among patients | 60(41.7%)<br>240 | 65(45.1%)<br>195 | 13(9%)<br>26 | 6(4.2%)<br>6 | $\frac{467}{144}$ | 3.24 |
| 5. | Omission of doses | 54(37.5%)<br>216 | 44(30.5%)<br>132 | 30(20.8%)<br>60 | 16(11.1%)<br>16 | $\frac{424}{144}$ | 2.94 |
| 6. | Instruction for administration, not clear. | 55(38.2%)<br>220 | 40(27.8%)<br>120 | 34(23.6%)<br>68 | 15(10.4%)<br>15 | $\frac{423}{144}$ | 2.94 |
| 7. | Traditional or religious belief | 39(27.1%)<br>156 | 64(44.4%)<br>192 | 30(20.8%)<br>60 | 11(7.6%)<br>11 | $\frac{419}{144}$ | 2.90 |
| 8. | Side effect of drugs | 55(38.2%)<br>220 | 64(44.4%)<br>192 | 15(10.4%)<br>30 | 10(7%)<br>10 | $\frac{452}{144}$ | 3.13 |
| 9. | Feeling better | 50(34.7%)<br>200 | 49(34%)<br>147 | 35(24.3%)<br>70 | 10(7%)<br>10 | $\frac{427}{144}$ | 2.97 |
| 10. | feeling worse | 50(34.7%)<br>200 | 64(44.4%)<br>192 | 19(13.2%)<br>38 | 11(7.6%)<br>11 | $\frac{441}{144}$ | 3.06 |
| 11. | Long waiting hours in the hospital | 80(55.6%)<br>320 | 40(27.8%)<br>120 | 8(5.6%)<br>16 | 16(11.1%)<br>16 | $\frac{472}{144}$ | 3.27 |
| GRAND | MEAN | | | | | | 3.19 |

Table 1 above show respondent responses to questions on reasons for non-adherence in relation to their medication taking behaviors or adherence to diabetic treatment. 50(34.7%) agreed that one of the reasons for non – adherence is the cost of medication is too expensive, 65(45.1%) strongly agreed while 18(12.5%) and 11(7.6%) disagreed and strongly disagreed respectively. 64(44.4%) agreed that one of the reasons for non – adherence is the complexity of dosage regime, 60(41.7%) strongly agreed while 15(10.4%) and 5(3.5%) disagreed and strongly disagreed respectively. 65(45.1%) agreed that forgetfulness is a key factor in the reasons for non – adherence, 60(41.7%) strongly agreed, but 13(9%) and 6(4.2%) respectively disagree and strongly disagree. 64(44.4%) and 55(38.2%) respectively agree and strongly agree that the side effect of drugs is a reason for non – adherence while 15(10.4%) disagree and 10(7%) strongly disagreed. On whether feeling better or worse is a reason for non – adherence, 50(34.7%) agreed on feeling better or worse, 49(34%) strongly agreed on feeling better and 64(44.4%) on feeling worse while 35(24.3%) disagreed on feeling better and 30(20.6%) disagreed on feeling worse. 40(27.8%) agreed that long waiting hours in the hospital is a major reason for non – adherence to their diabetic treatment, 80(55.6%) strongly agreed to this while 8(5.6%) disagree and 16(11.1%) strongly disagreed. Also,

on the table above, it has a grand mean score of 3.19 which falls under the score accepted as positive under the mean decision point on the 4point likert scale. (A mean score of 2.5 is accepted as a negative response for the items). Therefore, the findings revealed that respondents agreed that all factors mentioned in table 3 above are among the factors influencing non-adherence to diabetic treatment among patients receiving treatment in the selected tertiary hospitals in Imo state.

**Discussion**

On respondents' response to questions on reasons for non-adherence to their diabetic treatment in relation to their medication taking behaviors revealed that factors such as cost of drug being too expensive, complexity of drug, forgetfulness, feeling better or worse and long hospital waiting hours among others contribute to the level of adherence to treatment. Adherence to anti diabetic medications is crucial to achieve metabolic control as non- adherence with blood glucose lowering is associated with higher cholesterol level.[10] World health organization (WHO) identifies that non-adherence is a problem which has many associated factors which include socioeconomic factors, a medical related factor, therapy related factors patient behaviors.[11]

The high cost of medication has been indicated by majority of participants on their opinion on factors preventing optimal adherence and had been supported by previous studies where financial constraints was identified as a major hindrance to medication adherence among type 2 diabetes population affordability is a problem.[12]

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