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Factors Associated with Non-Adherence to Drugs and Dietary Regimen Among Type Ii Diabetes Mellitus Out-Patients Attending University College Hospital, Ibadan

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ABSTRACT: *Diabetes is an increasing global health problem and this puts high demands on the health care system. Medication non-adherence results in increased morbidity, mortality and financial loss among patients and non-adherence is multifactorial. This study therefore was aimed at determining factors associated with non-adherence to drugs and dietary regimen among Type II Diabetes Mellitus patients attending University College Hospital (UCH), Ibadan, Nigeria. This study utilized a quantitative design using descriptive survey method to collect data from 330 Type II diabetes out-patients in UCH, Ibadan on factors associated with non-adherence to drug and dietary regimen. Data were analysed using descriptive statistics (frequency, mean and standard deviation) for research questions and inferential statistics, Chi-square and ANOVA for testing hypotheses at 5% level of significance. Findings revealed that non-adherence to medication mean was 3.4±1.1 and 27.7% of respondents had poor adherence to medication. Mean attitude to medication non-adherence was 12.0±2.2 and 62.0% respondents had negative attitude to medication adherence. Clinical factors like: not being able to access clinic regularly for consultation and not getting medication information had influence on anti-diabetic medication non-adherence (1.37±0.49; F=42.036; P=0.000) and 1.54±0.50; F=29.431; P=0.000) respectively. Individual factors like: not being comfortable with physician diagnoses (1.33±0.47; F=22.190; P=0.000); found it difficult in taking their drugs when they are many (1.46±0.50; F=42.992; P= 0.000); receiving detailed written instruction regarding exercise programs from healthcare provider (1.43±0.50; F=23.485; P=0.000) were all influencing factors to anti-diabetics medication adherence. Lack of patients-physician relationship and inconsistent information about the medicines prescription influences non-adherence to anti-diabetic medication greatly in this study. Improving on these areas by health policy makers to enhance adherence to anti-diabetic medication are therefore suggested.*

KEYWORDS: diabetic out-patients, anti-diabetic medication, dietary regimen, factors, non-adherence.

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INTRODUCTION

Diabetes mellitus (DM) is a group of chronic medical conditions in which there is derangement of metabolism in the body. It could occur when there is absolute or low insulin production or resistance to the produced insulin, resulting in a sustained hyperglycaemic state (Adeloye, et.al., 2017). Diabetes mellitus is an emerging metabolic disorder of the 21st century and has continued to attract the attention of health practitioners, as it continues to decrease the efficiency of its victims without any promise of change in the near or far future if more is not done to avert the progressing chronic condition (Oyelami, et al, 2019). The global diabetes prevalence in 2019 is estimated to be 9.3% (463 million people), rising to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045 (Sun, et.al, 2021). The prevalence is higher in urban (10.8%) than rural (7.2%) areas, and in high-income (10.4%) than low-income countries (4.0%). One in two (50.1%) people living with diabetes do not know that they have diabetes (Sun, et.al, 2021). The global prevalence of impaired glucose tolerance is estimated to be 7.5% (374 million) in 2019 and projected to reach 8.0% (454 million) by 2030 and 8.6% (548 million) by 2045. The global prevalence (age-standardized) of diabetes has nearly doubled since 1980, rising from 4.7% to 8.5% in the adult population. This reflects an increase in associated risk factors such as being overweight or obese. Over the past decade, diabetes prevalence has risen faster in low- and middle-income countries than in high-income countries (WHO, 2016). Diabetes caused 1.5 million deaths in 2012. Higher-than-optimal blood glucose caused an additional 2.2 million deaths, by increasing the risks of cardiovascular and other diseases. Forty-three percent of these 3.7 million deaths occur before the age of 70 years. The percentage of deaths attributable to high blood glucose or diabetes that occurs prior to age 70 is higher in low- and middle-income countries than in high-income countries (WHO, 2016).

Type 2 DM is poorly controlled due to lack of adherence to the treatment regimen. Prevalence of the poor adherence treatment ranges from 67% to 74% (Divya & Pratibha, 2015). Poor glycemic control has consistently shown to be associated with long-term complications (Haghighatpanah, et al, 2018). Number of studies have been published about non-adherence to medication in Type 2 DM However it is essential to evaluate adherence on a regular basis due to changes in culture and life style. Medication non-adherence is defined as patient's failure to engage in a therapeutic regimen because of deficit in one or more of these pre-requisites: comprehension of the regimen, regard for the value of medical advice, or skills required for self-management.

Non-adherence to prescribed therapies is a costly problem in the care of patients especially those with chronic illnesses such as diabetes mellitus. Failure of a patient to adhere to recommended therapies leads to poorer health outcomes and increased healthcare costs. Non adherence to diabetic management regimen is possibly the most common reason for poor health outcomes among diabetic patients (Kassahun et al., 2016).

Various factors are associated with non-adherence to medication in DM patients, which can be categorized as patient centered, therapy-related or healthcare system related (Rwegerera, et.al., 2018). In Africa, up to 80% of diabetic patients are underdiagnosed, and appearing to the health care facilities with complications is not uncommon. The chronic nature of the disease without symptoms will contribute for the late presentations. For some, poverty is the main reason for not to appear at Hospitals and take medications (Boshe, et al, 2021).

Non adherence and non-compliance has been defined and used interchangeably. While noncompliance was defined as "the failure or refusal of a patient to cooperate by carrying out that portion of a medical care plan under his or her control," non-adherence was defined as "failure to adhere to a treatment plan or to follow a regimen in a consistent manner" and the extent which the person's behaviour for taking medication, following diet, or executing lifestyle changes, coincides with medical advice. The concept of non-compliance reinforces the dominance and paternalism of the medical model which implies professional power over patients. Hence, patients are seen to be irrational and willfully fail to observe instructions. Therefore, in this study non-adherence has been preferred over non-compliance.

Despite efforts to make a meticulous diagnosis and provide evidenced-based care, if a patient does not adhere to prescribed regimen, the treatment goal may not be met. Diabetes is incurable but with strict adherence to medication, informed dietary modification, appropriate physical exercise, regular follow-up appointments and other self-care activities, good glycaemic control can be maintained (Bagonza et al., 2015).

Many diabetic patients fail to adhere to their regimen for reasons, which may include forgetfulness, poor understanding of the nature of their disease, high cost of regimen and traditional beliefs about the disease. Other associated factors to non-adherence were noted as depression and diabetes related-emotional distress, fear of pricking self for self-monitoring of blood glucose, appointments that do not begin on time, poor provider-patient relationship, unpleasantness of regimen, complicating everyday life and fear of hypoglycaemia (Almaghaslah et al., 2018).

Researchers have found medication and life style adherence problems among diabetics most of which were done in developed countries. Most studies from developing countries like Nigeria either assessed medication non adherence alone or did it with samples that included both type1 and type 2 diabetics with paucity of information on studies assessing non adherence to other management regimens such as SMBG, and follow-up clinic visits among type 2 diabetic patients and factors that may be contributing to it. In Enugu there were few studies on adherence to antidiabetic drugs but none measured non adherence to

other self-care activities like self-monitoring of blood glucose and clinic follow up visits (Oguejiofor et al., 2014). The consequences of which could have resulted to increased costs to families where healthcare costs are borne via out of pocket expenditures, increased overall country healthcare costs, worsening and or increased morbidity, and death.

The researcher observed that diabetes mellitus patients in the clinic are coming down with complication such as foot ulcer, gangrenous legs; loss of vision and kidney disease and the most prominent of these was the gangrenous legs which lead to amputation. This was due to non-adherence to drugs and dietary regimens by the affected patients. There were 436 foot ulcer and gangrenous legs patients recorded between 2011 to 2020 (UCH Health Records, 2022) (see Appendix IV). The alarming rate of foot ulcer and gangrenous leg prompted the researcher to undertake the present study to determine factors associated with non-adherence to drugs and dietary regimen among Type II Diabetes Mellitus patients attending University College Hospital, Ibadan so as to proffer better health promotion intervention focusing adherence.

The main objective of this study is to determine factors associated with non-adherence to drugs and dietary regimen among Type II Diabetes Mellitus patients attending University College Hospital, Ibadan. The specific objectives of this study were to:

1. assess the level of non-adherence to drugs and dietary regimen among people living with Type II diabetes Mellitus;
2. examine the attitude towards adherence to anti-diabetic medication among people living with Type II diabetes Mellitus;
3. examine the individual factors influencing drugs and dietary regimen non-adherence among people living with Type II diabetes Mellitus; and
4. examine the clinical factors influencing drugs and dietary regimen non-adherence among people living with Type II diabetes Mellitus.

Research Questions

1. What is the level of non-adherence to drugs and dietary regimen among people living with Type II diabetes Mellitus?
2. What is the attitude towards adherence to anti-diabetic medication among people living with Type II diabetes Mellitus?
3. What are the individual factors influencing drugs and dietary regimen non-adherence among people living with Type II diabetes Mellitus?
4. What are the clinical factors influencing drugs and dietary regimen non-adherence among people living with Type II diabetes Mellitus?

Research Hypotheses

H_o1: There is no significant relationship between adherence to drugs and dietary regimen and their attitude towards non-adherence to drugs and dietary regimen.

H_o2: There is no significant relationship between factors influencing drugs and dietary regimen adherence and their adherence to drugs and dietary regimen.

METHODOLOGY

The study used a quantitative design and descriptive method to determine factors associated with non-adherence to drugs and dietary regimen among type II diabetes mellitus out-patients attending University College Hospital, Ibadan, Nigeria. In-patients (recently discharged for follow-up at the clinic) and Out-patients of the Medical Clinics in University College Hospital, Ibadan formed the population for this study. The inclusion criteria include registered patients of the hospital for at least 6 months and all type II diabetic patients receiving antidiabetic medication in the diabetic clinic during the study period. The exclusion criteria include patients with type II diabetes mellitus on admission as at the time of data collection.

The sample size for the quantitative data were determined by using Leisle-Kish formula for single proportion. A sample size of 300 was used for this study. A multistage sampling procedure which included purposeful and systematic random sampling techniques were adopted for the selection of the sample size from the patients with type II diabetes mellitus in the hospital.

A pretested self-administered semi-structured questionnaire was used to collect data on factors associated with non-adherence to drugs and dietary regimen among type II diabetes mellitus patients was used for data collection. To ascertain that content of the items and domains of the instrument were appropriate, experts in the area of study and statistician scrutinised the questionnaire and made vital corrections for face and content validity. Their contribution and suggestions were used appropriately for intellectual guidance and improvement. In order to determine the reliability of the questionnaire, a test re-test was conducted among 30 out-patients with type 2 diabetes mellitus in Ring-Road State Hospital, Ring-Road, Ibadan, which was approximately the 10 percent of the sample size of 300. The reliability score for pilot study was 0.786 which shows that the instrument was very reliable.

Four tertiary graduates (both males and females) were recruited as research assistants and trained by the researcher for 2 days on the objectives of the research, the basic knowledge about the research topic, the importance of ensuring accurate data, and all the questions in the questionnaire were reviewed with them to ensure thorough understanding of the research topic. They were taught on how to be courteous and friendly with the respondents in order to get their maximum cooperation. The research assistants were also demonstrated how to administer questionnaires and ask respondents questions regarding their challenges in completing the questionnaires.

Explanations were given to respondents as required to aid their understanding of unfamiliar terms. The questionnaires were self-administered. But opportunity was given to respondents who wished to fill the questionnaire by themselves and these (questionnaires) were retrieved back from each respondent immediately after completion and they were reviewed for completeness. Data were entered into the computer and analysed using SPSS version 27. Frequencies, proportions and percentages for categorical variables of interest and appropriate tables and figures were generated. Inferential statistics was conducted using chi-square test and ANOVA to determine the association between the dependent/outcome variable and other categorical independent variables of interest. Hypotheses were tested at 0.05 level of significance.

RESULTS

Research Question 1: What is the level of non-adherence to drugs and dietary regimen among people living with Type II diabetes Mellitus?

Table 1: Adherence to anti-diabetic medication

Variable	N	%
Extent of following the dietary advised by your healthcare providers		
Adequate	230	76.7
Little	46	15.3
None	24	8.0
Extent of adequacy to the use of anti-diabetic medicine		
Adequate	243	81.0
Little	29	9.7
None	28	9.3

Table 2: Non-adherence to medication grade

Adherence	No	%
Poor	83	27.7
Good	217	72.3
Total	300	100.0

Few (23.3%) of respondents had been inadequately following their diet advised by the healthcare providers and those who inadequately used their anti-diabetic medication and dietary were 19.0% (Table 1). Categorisation of respondents' adherence score was detemined by statistical 50 percentile mean score generated and this was grouped into having poor and good adherence to medication. Non-adherence to medication mean was 3.4±1.1 and 27.7% of respondents had poor adherence to medication (Table 2)

Research Question 2: What is the attitude towards adherence to anti-diabetic medication among people living with Type II diabetes Mellitus?

Table 3: Respondents' attitude towards adherence to anti-diabetic medication

(N=300)

Attitudinal questions	**Agree n(%)**	**Disagree n(%)**
I sometimes forget to take my medicine?	128(42.7)	172(57.3)
Thinking over the past 2 weeks, there was a day or were days when I did not take my medicine	100 (33.3)	200 (66.7)
I have ever cut back or stopped taking my medicine without telling my doctor	74 (24.7)	226 (75.3)
When I travel or leave home I sometimes forget to bring along my diabetic medication	61(20.3)	239(79.7)
I did not take my Diabetic medicine yesterday	61(20.3)	239(79.7)
When I feel like my diabetes is under control, I sometimes stop taking my medicines	82(27.3)	218 (72.7)
Taking medication every day is a real inconvenience for some people. Do you ever feel hassled about sticking to your diabetes treatment plan?	86(28.7)	214 (71.3)
Frequency of having difficulty remembering to take all medications	**N**	**%**
All the time	36	12.0
Usually	32	10.7
Sometimes	47	15.7
Once in while	73	24.3
Never/rarely	112	37.3

Table 4: Attitude to medication adherence grade

Attitude	**No**	**%**
Negative	186	62.0
Positive	114	38.0
Total	300	100.0

Above half (57.3%) of respondents disagreed that they sometimes forgot to take their medicine and in the same manner, 66.7% debunked not taking their medicine in last two weeks. Respondents who had never cut back or stopped taking their medicine without telling their doctors because they felt worse when they took it were 75.3% and approximately eighty percent (79.7%) had never travelled or left home sometimes and forgot to take along their diabetic medication. Majority (79.7%) of respondents disproven

that they failed to take their diabetic medicine yesterday and in the same manner, 72.7% did not sometimes stop taking their medicines when they felt like their diabetes was under control. Respondents who never felt hassled about sticking to their diabetes treatment plan were 71.3%. Among the respondents, those who never/rarely had difficulty in remembering to take all medications were 37.3% and followed by those said it was once in while (24.3%) (Table 3).

Categorisation of respondents' attitudinal score was detemined by statistical 50 percentile mean score generated and this was grouped into having negative and positive attitude to medication adherence. Mean attitude to medication adherence was 12.0±2.2 and 62.0% of respondents had negative attitude to medication adherence (Table 4).

Research Question 3: What are the individual factors influencing drugs and dietary regimen non-adherence among people living with Type II diabetes Mellitus?

Table 5: Individual factors influencing non-adherence (N=300)

Individual influencing factors	**Yes Freq.(%)**	**No Freq.(%)**
Did the physician completely understands your health problem when you saw him on the day of appointment?	250(83.3)	50(16.7)
Do you find it difficult with your drugs when they are many?	234(78.0)	66 (22.0)
Have you ever received detailed written instruction regarding exercise programs from any health care provider?	232(77.3)	68(22.7)
Have you ever received detailed written instruction regarding healthy dietary habits from any health care provider?	231(77.0)	69(23.0)

Results on individual factors as an influence on patients with diabetic was presented in table 5. From the result, few (16.7%) of respondents reported that their doctors completely understood health problem presented by them when they were seen on the day of appointment and 16.7% felt not comfortable when their doctors prescribed multiple medicines for their diabetes. Less than one-quarter (22.7%) of respondents declared that they had never received detailed written instruction regarding exercise programs from health care provider and 23.0% of them had never received detailed written instruction regarding healthy dietary habits from health care provider.

Research Question 4: What are the clinical factors influencing drugs and dietary regimen non-adherence among people living with Type II diabetes Mellitus?

Table 6: Clinical factors influencing non-adherence (N=300)

Clinical influencing factors	Yes Freq.(%)	No Freq.(%)
Is your physician regularly available?	251(83.7)	49(16.3)
Were you given adequate information on your prescribed drugs?	205(68.3)	95(31.7)
Does the medicine have any unpleasant side effects?	157(52.3)	143(47.7)

Variable	N	%
Action taken when experienced the side effects (n=157)*		
Sought physician	125	79.6
Resort into prayer	8	5.1
Sought patent medicine vendor	7	4.5
Stop using the drug(s) and not complained to doctor	8	5.1
Did nothing	9	5.7
No effect	108	36.0

** Not all the results are equal to 300 because not applicable had been deleted*

Clinically, 83.7% of respondents regularly visit their physician and 68.3% reported that they had information about the medicines prescribed from doctor. Above half (52.3%) of respondents recounted having knowledge of unpleasant side effects. Action taken by majority (79.6%) when experienced the side effects was to seek physician (Table 6).

Test of Hypotheses

H_o1: There is no significant relationship between adherence to drugs and dietary regimen and their attitude towards non-adherence to drugs and dietary regimen.

Table 7: Relationship between adherence to drugs and dietary regimen and respondents' attitude towards non-adherence

Adherence to medication	Attitude towards adherence to medication			Chi-square (χ^2)
	Negative	Positive	Total	
Poor	69(37.1)	14(12.3)	83(27.7)	$\chi^2 = 21.750$
Good	117(62.9)	100(87.7)	217(72.3)	$p = 0.000$*
Total	186(100.0)	114(100.0)	300 (100.0)	

* - Significant at 0.05;

The relationship between adherence to drugs and dietary regimen and respondents' attitude towards adherence was shown in Table 7. The results revealed that, statistically, adherence to medication was significant to respondents' attitude towards the use of drugs and dietary regimen. Majority (62.9%) of respondents who claimed adherence to medication were still found having negative adherence to anti-diabetics medication (p=0.000). Based on the

result shown in Table 7, the null hypothesis, which stated that there is no significant relationship between adherence to drugs and dietary regimen and their attitude towards adherence to drugs and dietary regimen.is therefore rejected (p<0.05).

H_o2: There is no significant relationship between factors influencing drugs and dietary regimen adherence and their adherence to drugs and dietary regimen.

Table 8: Showing ANOVA results on relationship between factors influencing medication adherence and adherence to medication

Variable	Response	N	Mean±(SD)	Mean square	*F*	Significance level
Individual factors						
The physician completely understood your health problem presented to him on the day of appointment	Poor	83	1.33±0.47	2.888	22.190	0.000*
	Good	217	1.11±0.31			
	Total	300	1.17±0.37			
Felt comfortable when physician prescribed multiple medicines for diabetes	Poor	83	1.46±0.50	6.490	42.992	0.000*
	Good	217	1.13±0.34			
	Total	300	1.22±0.42			
Ever received detailed written instruction regarding exercise programs from health care provider	Poor	83	1.41±0.50	3.842	23.485	0.000*
	Good	217	1.16±0.36			
	Total	300	1.23±0.42			
Ever received detailed written instruction regarding healthy dietary habits from health care provider	Poor	83	1.43±0.50	4.763	29.345	0.000*
	Good	217	1.15±0.36			
	Total	300	1.23±0.42			
Clinical factors						
Able to visit the physician regularly for consultation	Poor	83	1.37±0.49	5.068	42.036	0.000*
	Good	217	1.08±0.28			
	Total	300	1.16±0.37			
Had information about the medicines prescribed from doctor	Poor	83	1.54±0.50	5.835	29.431	0.000*
	Good	217	1.23±0.42			
	Total	300	1.32±0.47			

*Comparison within the variables; * - Significant at 0.05*

The ANOVA results revealed that, statistically, individual factors have influence on diabetics patients' adherence to medication. This results was shown in all variables tested under individual factors. Such these are: The physician completely understood your health problem presented to him on the day of appointment (1.33±0.47; F=22.190; P=0.000); felt comfortable when physician prescribed multiple medicines for diabetes (1.46±0.50; F=42.992; P= 0.000); rarely received detailed written instruction regarding exercise programs from health care provider (1.43±0.50; F=23.485; P=0.000) and ever received

detailed written instruction regarding healthy dietary habits from health care provider (1.43±0.50; *F*=29.345; *P*=0.000) (Table 8).

Result of ANOVA in the table shows that clinical factors variables tested, such as not being able to visit the physician regularly for consultation and being granted information about the medicines prescribed from doctor have significant influence on diabetic patients' adherence to medication (1.37±0.49; *F*=42.036; *P*=0.000) and 1.54±0.50; *F*=29.431; *P*=0.000) respectively (Table 8)

DISCUSSION

This study revealed that majority (72.3%) of respondents were adjudged adherent to antidiabetic medications, which is comparable to other studies that documented high adherence levels of 75.4%, 72.5%, and 83.3% among patients (Adisa, et al, 2011; Adisa & Fakeye 2014) Other studies reported low adherence to medications (Ahmad, et al, 2013; Chew, et al, 2015). These variations in the estimate of adherence between studies may be attributed to the lack of a standardized method of assessing adherence, patient populations, and differences in adherence cutoff points (García-Pérez, et al, 2013). Apart from this, the proportion of non-adherence in this study could also be due to the fact that it was conducted in a hospital where majority of the patients are usually from low socioeconomic background and are less educated.

Despite that above half of respondents claimed not to have forgotten to take their medicine at any point of time did not proved that they were hundred percent adherence to their medication because part of those who disclaimed fugitiveness were found among those did not taking their medicine in last two weeks and who sometimes cut back or stopped taking their medicine without telling their doctors because they felt worse when they took. Although were few in number and percentages. The present results was similar to Gelaw, et al., (2014). This again may be due to poor knowledge of the disease especially in the insulin treated patients who should not stop the drug because of ill-health.

The current study result revealed that attitude of respondents has a great influence on their adherence to anti-diabetic medication. This could be linked with age, education, occupation, family support and efficacy of the previous medication experience by patients with diabetic in this study (either positively or otherwise). This result corroborate previous studies conducted by Heissam in Egypt in 2014 (Heissam, et al, 2015). The same findings have been reported by Albert in South East Nigeria, and Chinenye in a multi-centred Nigerian study (Chinenye, et al, 2012). This finding was also supported by Khosravizade, et al (2014) where patients with diabetics' spouses was reported to be motivating factor or hindrance to medication adherence.

In this study, respondents who reported that physician completely understood their health problem presented to him on the day of appointment; felt comfortable when physician prescribed multiple medicines for diabetes; ever received detailed written instruction regarding exercise programs from health care provider and ever received detailed written instruction regarding healthy dietary habits from health care provider were all found to be statistically significant to adherence to medication. The implication of this is that, patients with diabetics will be adherence to their drugs as long as they were getting good attention from their physician and having good understanding of their treatment and medication prescribing to them. The physician-patient relationship plays a major role in keeping the patient well informed about the medications he consumes and has direct influence on either adherence or none (Divya & Pratibha, 2015). Patients who did not have adequate information about their drug regimens were probably at risk of non-adherence because they had not understood how to take their drugs causing them to miss on many occasions.

CONCLUSION

Non-adherence or compliance with anti-diabetics was moderate in this study while most of the respondents had negative attitude to medication adherence**.** Clinical factors like: not being able to access clinic regularly for consultation and not getting medication information had influence on anti-diabetic medication non-adherence while individual factors like not being comfortable with physician diagnoses, difficulty in taking drugs when they are many, and receiving detailed written instruction regarding exercise programs from healthcare provider were all influencing factors to anti- diabetics medication adherence.

Recommendations

The following recommendations have been made based on the study findings:

(i) Adequate, clear, and quality information regarding diabetes and antidiabetic medications should be provided to all diabetic patients in order to make the patient aware of future complications of the disease and the benefits of drug therapy as the factors related to non-adherence in this area are modifiable and associated with low knowledge about the disease and treatment.

(ii) The practice of cost-free medication service to the patients that cannot afford to buy it in this hospital is appreciable as cost of drug is among the factors hindering adherence but the inclusion of other needy patients should be considered since there are still large number of poor patients who are losing hope of their future.

(iii) The medication adherence rate in this study was 72.3%. Although the exact estimate of adherence may not be accurately depicted, as this is a small cross-sectional study, future large-scale studies are needed for further understanding of the problem and development of more effective interventions.

(iv) Medication non-adherence has been consistently viewed as the most difficult aspect of the diabetes regimen. Therefore, patient education plays a very important role to improve

the non-adherence rate. Further researches are needed to develop and refine interventions to improve adherence of diabetic patients and are to assess the effectiveness of removing perceived barriers on the adherence.

(v) There is need to design strategies to help patients understand their dietary regimens in order to improve their adherence. This is to help prevent the complications of diabetes mellitus, which are debilitating and if not prevented can increase the burden of a disease that is already on the increase.

Nursing implications

This research might contribute to understanding factors affecting the ability to follow recommended treatments for diabetes patients. In order to improve adherence among diabetes patients the risk of non-adherence has to be identified. To identify which factors that contributes to not following recommended treatment the work towards a better adherence and better health for the patients can be easier. If the health care providers have knowledge of factors that affect adherence they could easier try to design a treatment that fits the patient. The problem could be shown to be on a society level. This also needs to be identified in order to improve the problems in society that could affect adherence among the diabetes patients in Nigeria.

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