



Knowledge and Level of Diabetes Mellitus Management Compliance among Clinic Attendees at Jericho Specialist Hospital, Ibadan, Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/JAMMR/2021/v33i2131151

Editor(s):

(1) Fatma Mohammad Nasr, Theodor Bilharz Research Institute, Egypt.

Reviewers:

(1) Olena Yelizarova, National Academy of Medical Sciences, Ukraine.

(2) Sukhraj Kaur, Government Medical College, India.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/74382>

Original Research Article

Received 07 August 2021
Accepted 15 October 2021
Published 08 November 2021

ABSTRACT

Background: Diabetes Mellitus has emerged as one of the most challenging public health problems in the 21st century, it is a serious public health problem that threatens the quality of life of patients which can lead to acute and chronic complications. This study, therefore, assessed knowledge and level of diabetes management compliance among clinic attendees at Jericho specialist hospital, Ibadan, Nigeria

Methods: A descriptive cross-sectional study that employed a two-stage sampling technique was designed to fill this gap. The records revealed that the ratio of males to females was 1:3, the respondents were stratified by gender, so the proportion of females and males selected was based on the aforementioned ratios. Systematic random sampling was then used in selecting respondents who chose to participate in the study using the list of males and females in the hospital register who was at the clinic on the day of the interview as sampling frames. A pre-tested

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semi-structured questionnaire was used to obtain information on two hundred and twenty respondents. Knowledge scores of ≤ 7 , > 7 was rated poor and good respectively. Data were analyzed using descriptive and inferential statistics.

Results: The mean age was 49.7 ± 10.29 years which many (72.2%) were female. Almost all the respondents (98.2%) had good knowledge of compliance with the management of diabetes. Many (74.1%) ascertained that they sometimes forget to take their diabetes drugs. Meanwhile, most (82.5%) reported that taking medication every day is a real inconvenience for some people as they could get annoyed about sticking to their blood glucose treatment plan.

Conclusion: There was generally good knowledge on the compliance to diabetes management which there is a need to consider the certain sociodemographic factors of the patients before recommending management.

Keywords: Diabetes Mellitus; knowledge; compliance; diabetes management.

1. INTRODUCTION

Diabetes Mellitus (DM) has emerged as one of the most challenging public health problems in the 21st century [1] it is a serious public health problem that threatens the quality of life of patients which can lead to acute and chronic complications. It is a significant cause of disability and death in many countries [2]. The prevalence of diabetes mellitus was 171 million people in the year 2000 and is expected to increase to 366 million people in the year 2030 worldwide [3]. The increase in population growth, ageing, urbanisation and increasing prevalence of obesity and physical inactivity are other factors resulting in the increased incidence of diabetes mellitus [4]. The greatest burden of this condition is felt in low and middle-income countries, and these nations account for about 80% of all cases of diabetes [5].

Diabetes is a chronic disease of life long duration and its management requires a fundamental change in the patients' lifestyle [6]. The most important member of the diabetic care team is the patient and the success of long-term maintenance therapy for diabetes mellitus depends largely upon the patient's compliance with a therapeutic plan [7]. Adherence to prescribed therapies is influenced by multiple factors like economical and lifestyle therapy such as route of administration, duration of treatment, the complexity of treatment regimen, side effects of medications, healthcare system issues such as easy accessibility to the physician and availability of medicines at a reasonable cost [8]. Compliance with a prescribed therapeutic regimen is a complex health behaviour and can reduce morbidity or mortality of chronic illness where information provided to the patient increases their knowledge and understanding of the risk factors for their illness and teaches

preventive behaviours like exercises, smoking cessation, dietary changes, medication and stress management [9].

In Nigeria, a Sub-Saharan African nation, there are about 3.9 million diabetic adults aged years 18 and above years [10-12] reported that diabetes mellitus in South-West, Nigeria has about 5.5%. Death rates were about 1.5 times higher among adults aged 18 years or older with diagnosed diabetes who did not comply with their treatment [13]. In Nigeria, studies have shown that several factors affect treatment compliance in diabetes mellitus. Nwaokoro *et al.* [14] and Abdulazeez *et al.* [15] opined that there was a significant association between patients' level of education and compliance. In a recent study, it has been stated that the barriers to diabetes medication and dietary regimen include knowledge, and educational level of individual and this study has been supported by Ajibade *et al.* [16] Brides *et al.* [17] and Khan *et al.* [18]. Many studies have shown that increasing patient knowledge regarding disease and its complications have significant benefits for patient compliance to treatment and decreasing complications associated with disease [19].

Non-compliance with the management of diabetes mellitus generally poses burdens on patients and society at large due to its antecedent cost of care and productive time loss [20]. There is also an increase in diabetic-related health challenges due to poor management and treatment non-compliance among the victims including blindness, delayed wound healings, foot disorders and amputations in extreme cases [21]. Factors influencing diabetes care management and treatment compliance includes; poor knowledge, inconsistent follow-up, low socioeconomic status, poor provider-patient relationships are evident in poor glycaemic control complications [22].

Unfortunately, inadequate awareness about the prevention and control of diabetes and its complication among the general population and diabetic population even with an increase in education and many awareness enhancing programmes and screening by the government has been identified and highlighted by Delamater [23]. This study, therefore, assessed knowledge and level of diabetes management compliance among clinic attendees at Jericho specialist hospital, Ibadan, Nigeria

2. METHODOLOGY

2.1 Study Design

This is a descriptive cross-sectional study that utilized a semi-structured questionnaire to obtain information from respondents.

2.2 Study Site

The setting for the study was Jericho specialist hospital, Ibadan. The hospital is operative under the Oyo State hospital management board which was established in 1987. The hospital is strategically located at Magazine Road in the city of Ibadan which is the largest city in the West Africa sub-region. The hospital was formally for residential during the Colonial era and was later converted to Jericho general hospital then subsequently converted to Jericho specialist hospital. The hospital admits and treats all medical and surgical cases except paediatric cases. The hospital has 32-bed spaces, 178 members of staff and it is headed by a hospital consultant. The hospital runs various clinics and it is opened throughout the year for consultation (Oyo-State Health Management Board, 2018).

2.3 Study Population

The study populations for the study are adults 18 years and above attending the medical outpatient clinic of the Jericho specialist hospital, Ibadan and living with diabetes mellitus for more than six months since diagnosis.

2.3.1 Inclusion criteria

The respondents who were included in this study were diabetic patients from the age of 18 and above who attends Jericho Hospital Ibadan for healthcare.

2.3.2 Exclusion criteria

Clients who had been living with diabetes mellitus for less than six months since diagnosis

2.4 Sample Size

The sample size for this study was calculated using Yamane, 1967 sample size calculation.

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

Where

n= required sample size

N= the population of the diabetic patients at Jericho Specialist Hospital

e= degree of error tolerance at 5%

$$\text{therefore } n = \frac{400}{1+400(0.05)^2}$$

$$n = \frac{400}{2}$$

$$= 200$$

$$\text{Attrition of 10\%} = \frac{10 \times 200}{100} = 20$$

Therefore total sample size will be 200 + 20 = 220

2.5 Sampling Technique

A 2-stage sampling technique was used to select respondents for this study.

Stage 1: The respondents were stratified by gender. The records revealed that the ratio of males to females was 1:3. So the proportion of females and males selected was based on the aforementioned ratios.

State 2: Systematic random sampling was then used in selecting respondents who chose to participate in the study using the list of males and females in the hospital register who was at the clinic on the day of the interview as sampling frames.

2.6 Method for Data Collection

A semi-structured questionnaire was used for data collection and this was developed jointly with the researchers and was used to collect information on the respondent's socio-demographic characteristics, knowledge of compliance with diabetic management and compliance with management of diabetes among respondents.

2.7 Validity of the Instrument

The questionnaire was given to experts in the field of diabetic management for review, verification and modification. The draft questionnaire was then back-translated into the Yoruba Language (*the language spoken by most people in the study area*) by someone with a Master Degree who is versed in both English and Yoruba Languages. The Yoruba version was then given to another person equally with a Master Degree who is versed in both Yoruba and English Languages to translate back to English Languages.

2.8 Reliability of the Instrument

The test re-test copies of the instruments were pre-tested among 10% of the total sample size (220) which amounted to 22 participants in total. The data was then subjected to Cronbach Alpha statistical test. Cronbach's alpha is a measure of internal consistency, to know how relevant the instrument is to addressing the set objectives of the study. The pre-test Cronbach alpha is a test used to demonstrate the levels of the correlation coefficient of an instrument. A Cronbach alpha of 0.813 was gotten which the closer the value of the reliability test to 1, the more reliable is the instrument. After the draft instrument pre-test, the necessary modification and adjustments were made before proceeding to conduct the main data collection.

2.9 Procedure for Data Collection

A proposal was written to the ethical committee for approval to carry out the study. Following corrections and approval by the ethical committee, a letter from the school with an attached approved proposal was then submitted to the Chief consultant in charge of Jericho specialist hospital, Ibadan before assessing the target population for data collection. The consent of the population was obtained before data collection.

2.10 Data Analysis and Management

The data obtained were entered into the computer and analyzed using descriptive statistics and inferential statistics such as the Chi-square test and Fisher's exact test with the aid of Statistical Package for Social Sciences now known as Statistical Product and Service Solution. The findings were presented using tables of frequency distribution, simple percentages and charts. Knowledge scores of ≤ 7 , > 7 was rated poor and good respectively.

Data were analyzed with SPSS version 21 using descriptive statistics.

3. RESULTS

3.1 Socio-demographic Characteristics

Table 1 depicts the socio-demographic variables of respondents; Two hundred and twelve successfully participated in the study. The mean age was 49.7 ± 10.3 years and the modal age group was 35 years and above with the frequency of (97.6%). Many (72.2%) were female as against 27.8% that were male. Regarding religion, more than half of the respondents (58.0%) were Christians while Islam accounted for 41.0%, other religions as identified in this study represented (0.9%). The findings also show that almost all the respondents (97.6%) were Yoruba followed by the very few others (1.9%) and only one person was Igbo (0.4%). The predominant religion was Christianity (58.0) followed by Islam (41.0%) and only 0.9% claimed to have belonged to other religions.

3.2 Respondents' Background Characteristics

Table 2 depicts the background characteristics of the respondents; considering respondents occupation trading ranked the highest with 36.9%, followed by business and civil servant accounting for 22.0% and 23.1% respectively. More so, in respect of the monthly income #20000-50000 ranked highest with 37.3% followed by #10000-#20000 representing 20.8%.

3.3 Patients' knowledge of Compliance to the Management of Diabetes

Table 3 shows the knowledge of respondents on compliance with management. Virtually all the respondents were knowledgeable about compliance. Fig. 1 shows the vast majority of the respondents 98.2% had good knowledge as against 1.8% that had poor knowledge.

3.4 Compliance with Management of Diabetes among Adult

Table 4 shows compliance to the management of diabetes among adults, many (74.1%) ascertained that they sometimes forget to take their diabetes drugs. The majority (99.1%) of the respondents reported that complying with lifestyle modification and taking drugs as prescribed can help prevent complications of

diabetes. Also, only 42.5% reported that there were days they forgot to take their diabetic drugs while very few 9.4% reported that they stopped taking their drugs without telling their doctors because they felt worse when they took it. Meanwhile, most (82.5%) of the respondents reported that taking medication every day is a real inconvenience for some people as they could get annoyed about sticking to their blood glucose treatment plan.

Table 1. Social-demographic Characteristics

Socio-demographic characteristics	Frequency (212)	Percentage (%)
Age group (years)		
<30	3	1.4
30-39	32	15.1
40-49	77	36.3
50-59	64	30.2
60-69	28	13.2
≥70	8	3.8
Sex		
Male	59	27.8
Female	153	72.2
Religion		
Christianity	123	58.0
Islam	87	41.0
Others	2	0.9
Tribe		
Yoruba	207	97.6
Igbo	1	0.5
Others	4	1.9
Marital status		
Single	7	3.3
Married	177	83.5
Separated	11	5.2
Widowed	16	7.5
Others	1	0.5
Level of education		
Primary	54	25.5
Secondary	64	30.2
Tertiary	79	37.3
Others	15	7.1

Table 2. Respondents' Background Characteristics

Background Characteristics	Frequency	Percentage (%)
Occupation		
Business	47	22.2
Civil servant	49	23.1
House wife	4	1.9
Trader	78	36.8
Teachers	11	5.2
Others	23	10.8
Respondents' monthly income		
N5,000-N10,000	21	9.9
N10,000-N20,000	44	20.8
N20,000-N50,000	79	37.3
N50,000-N100,000	26	12.3
N100,000 and above	22	10.4
Others	20	9.4

Table 3. Patients’ knowledge of compliance to the management of diabetes (n=212)

Patients’ knowledge of compliance	Frequency	Percentage (%)
Compliance can be defined as patient’s behaviour coincides with healthcare providers’ recommendation for health		
Yes	212	100.0
No	0	0
Don’t know	0	0
Compliance can also be defined as a means of following recommended line of treatment when feeling the symptoms only.		
Yes	0	
No	212	0
Don’t know	0	100.0
Diabetic Mellitus is a chronic progressive disease that can lead to debilitating complications and premature death.		
Yes	212	100.0
No	0	0
Don’t know	0	0
Checking the glucose level routinely and compliance with prescribed medications can go a long way in reducing associated complications to diabetes mellitus.		
Yes	212	100.0
No	0	0
Don’t know	0	0
Diabetes affects almost every part of a diabetic person’s.		
Yes	212	100.0
No	0	0
Don’t know	0	0
Diabetes mellitus require life-long treatment therefore patients’ needs more discipline in the compliance of drugs daily.		
Yes	212	100.0
No	0	0
Don’t know	0	0
Diabetic drugs should be taken only when blood sugar is high or daily.		
Yes	211	99.5
No	1	0.5
Don’t know	0	0
The knowledge and skills of patients can affect their compliance.		98.6
Yes	209	1.4
No	3	0
Don’t know	0	
Non-compliance is both intentional and unintentional.		
Yes	212	100.0
No	0	0
Don’t know	0	0

4. DISCUSSION

The study revealed that the respondents’ age ranged from 18 to 75 years, and the mean age

was 49.7±10.3 years; but this is not surprising, because it falls within years where the labour force is still active and will probably need a high

level of compliance to the management of diabetes mellitus and improve their quality of life, thus contribute to national development. Surprisingly, majority of the respondents were females; and this could be attributed to the fact that the prevalence of diabetes for females are

higher than their male counterpart. The study indicated that more than half of the respondents were Christians, followed by Islam which is expected as these were the two dominant religions in the study area.

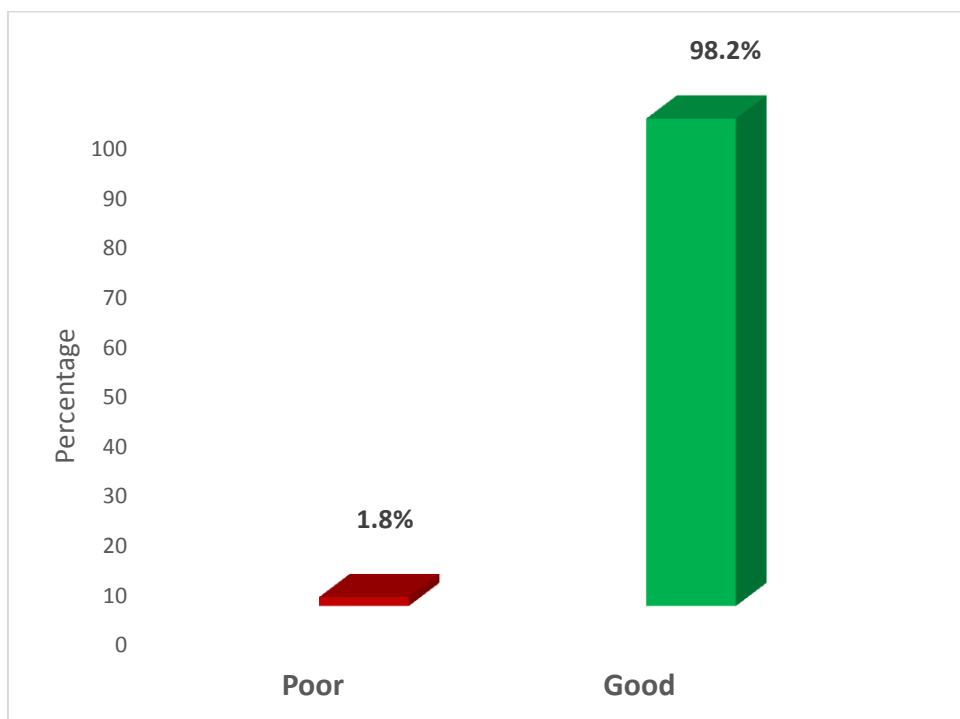


Fig. 1. Overall knowledge of respondents on compliance to management

Table 4. Level of compliance with management of diabetes among adults (n=212)

Level of compliance with management of diabetes	Yes		No	
	Freq	%	Freq	%
You sometimes forget to take your diabetic drugs sometimes	157	74.1	55	25.9
Complying with lifestyle modification and taking drugs as prescribed can help prevent complications of diabetes.	210	99.1	2	0.9
Any days you did not take your diabetic drugs in the past two weeks because people sometimes miss taking their drugs for reasons other than forgetting	90	42.5	122	57.5
Ever cut back or stopped taking drugs without telling doctor, because you felt worse when you took it	20	9.4	192	90.6
Sometimes forget to take along diabetes drugs when travelling or leave home	152	71.7	60	28.3
Took diabetes drugs yesterday	199	93.9	13	6.1
Sometimes stop taking medication when one feels like diabetes is under control.	81	38.2	131	61.8
Get annoyed about sticking to your blood glucose treatment plan because taking medication every day is a real inconvenience for some people.	175	82.5	37	17.5
Eating meals and snacks at about the same time each day	83	39.2	129	60.8
Engage in any exercise	206	97.2	6	2.8
Able to go for all check-ups in the past month	87	41.0	125	59.0

More than three-quarters of the respondents claimed that compliance can be defined as patient's behaviour coincides with healthcare providers' recommendation for health which concurs with the findings of Bagonza, *et. al.* [24] where they defined patient's compliance with treatment as the extent to which a person's behaviour, taking of medication, following a diet or executing lifestyles changes corresponds with agreed recommendations from healthcare providers. In a related study conducted by Khan et al. [25] compliance in healthcare was defined as the extent to which a patient's behaviour (in terms of taking medication, executing lifestyle changes, undergoing a medical test or keeping the appointment with physicians) tally with the health care provider's recommendations for health and medical advice.

This study revealed that the majority of the respondents claimed that diabetic Mellitus is a chronic progressive disease that can lead to debilitating complications and premature death; and this agrees with the findings of a study conducted by Ogbera and Kuku, [26] which reported that diabetes is a chronic medical condition manifesting as a result of the inability of the pancreas to produce sufficient insulin or defective insulin usage by the body which is rapidly contributing to the disease and death worldwide. In a related study conducted by Rwegerera, Moshomo and Rivera [27] it was reported that diabetes mellitus is a chronic disease in which long term medical attention is needed to limit both the development of its devastating complications and to manage these complications when they occur. Another study was done by Healthy Caribbean Coalition (HCC) NCD Alliance, [28] reported that the disease is one of the leading contributors to the Non-communicable Diseases (NCDs) burden in the world and together with other NCDs, they constitute the major cause of deaths accounting for 60% of all mortality globally.

Also, the present study revealed the all the respondents have knowledge that checking the glucose level routinely and compliance with prescribed medications can go a long way in reducing associated complications to diabetes mellitus. This corroborates the assertions of numerous researchers who noted that management of diabetes mellitus depends largely on the affected person's ability to pursue self-care in everyday life such as dietary modification, physical exercise and pharmacotherapy among other behavioural

modifications [29]. It was noted in this study that a large percentage of the respondents claimed that diabetes mellitus requires life-long treatment therefore patients' needs more discipline in the compliance of drugs daily. This concurs with the findings of a study by Rwegerera, Moshomo and Rivera [30] who reported that diabetes mellitus is a chronic disease in which long term medical attention is needed to limit both the development of its devastating complications and to manage these complications when they occur.

This study revealed that it is evident that almost all the respondents have knowledge that complying with lifestyle modification and taking drugs as prescribed can help prevent complications of diabetes. This corroborates the assertions of numerous researchers who noted that management of Diabetes mellitus depends largely on the affected person's ability to pursue self-care in everyday life such as dietary modification, physical exercise and pharmacotherapy among other behavioural modifications. It was noted in the present study that taking medication every day is a real inconvenience for some people. Some respondents also get annoyed about sticking to their blood glucose treatment plan. More so, when they feel like their diabetes is under control, they sometimes stop taking their medication. This also corroborates the findings of a study conducted by Adisa and Fakeye, who reported that the complexity of the management of diabetes mellitus makes it difficult to comply with various regimens and thereby affecting the general health care outcome of patients.

It was revealed many were eating their meals and snacks at about the same time each day, and they also engaged in exercises. This supports the findings of a study conducted by Beverly, et al [31] who affirmed that the management of diabetes requires patients to perform complex self-care regimens, including weight reduction, frequent blood glucose monitoring, taking oral and insulin medications, engaging in physical activity, adhering to nutrition guidelines, and attending clinic appointments. The present study revealed that more than half of the respondents claimed that in the past month, they were not able to come for all check-ups. This concurs with a study conducted by Deerochanawong and Ferrario [32] who reported that management of diabetes represents an enormous challenge for health systems at every level of development.

5. CONCLUSION

The study revealed that almost all of the respondents had good knowledge on the compliance to diabetes management, however, many reported forgetting to take their diabetic drugs sometimes, also, when they feel like their diabetes is under control, some of them sometimes stop taking their medication. Most get annoyed about sticking to their blood glucose treatment plan because taking medication every day is a real inconvenience for most people, which almost all the respondents engage in exercise and many were unable to go for a check-up.

The study reinforces the view that the main approach to managing this problem is to improve all stakeholders' understanding, compliance and management of the disease using suitable health provisions and widespread educational campaigns. Training and empowering of health care providers for delivering adequate health messages. Media and nongovernmental organizations should play a role in raising the awareness of diabetics in a simplified way.

CONSENT

Each respondent was informed about the study and its objectives, while assuring the respondents of the confidentiality of the information given, consent was obtained from the respondents and they were told that they have the right to refuse participation without coercion.

All data collected from the participants were kept confidential and were used for research purposes only. The participants of this study gained knowledge on how to comply with the management of diabetes mellitus. The identified challenges of compliance will be communicated to the appropriate authorities for subsequent interventions. The participants were not exposed to any form of harm or injury during the research process. The participants were informed about the right to decide if they want to be part of the study or not and the freedom to withdraw their participation at any point during the study. The researcher was responsible for all costs that were incurred in the course of the research work.

ETHICAL APPROVAL

Ethical approval was received for this study from the Joint Oyo State Ministry of Health Ethical

Review Committee. Subsequently, a letter was written to the chief Consultant in charge of Jericho specialist hospital, Ibadan to obtain permission to collect data. The approved letter was then taken to the medical outpatient department.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Oyelami F, Oshiname F, Ekerete-Udofia C, Adelekan A. Knowledge and Factors Associated with Treatment Compliance among Diabetes Mellitus Patients in Selected Hospitals in Ibadan, Oyo State, Nigeria. *Journal of Advances in Medicine and Medical Research*. 2017;23(7):1–8. <https://doi.org/10.9734/jammr/2017/35670>
2. Amokute CC, Hussein S. Screening of King Saud University community of diabetes mellitus. *Pract. Diabetes Mellitus*. 2011;87-88.
3. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care*. 2004; 27(5):1047–53.
4. Shivashankar M, Mani D. A brief overview of diabetes. *Int J Pharm Pharmaceut Sci*. 2011;3(Suppl4):22–7.
5. Zhang P, Xinzhi Z, Jonathan B, Dorte V, Richard S, Jonathan S, Gregory N. Global healthcare expenditure on diabetes for 2010 and 2030. *Diabetes Research and Clinical Practice*. 2010;87(3):293-301.
6. Ehwareme TA, Ogbogu CJ, Mbadugha C, Obiekwu AL. Compliance to treatment regimen among diabetic patients attending outpatient department of selected hospitals in Benin City, Edo State. *Journal of Public Health and Epidemiology*. 2018;10(4):97–107. <https://doi.org/10.5897/jphe2018.1002>
7. Adejoh SO. Diabetes Knowledge, Health Belief, and Diabetes Management among the Igala, Nigeria *SAGE Open*. 2014;1-8.
8. Tiv M, Viel JF, Mauny F, Eschwège E, Weill A, Fournier C, Fagot-Campagna A, et al. Medication adherence in type 2 diabetes: the ENTRED study 2007, a French Population-Based Study. *PLoS One*. 2012;7(3):e32412.

9. Evans CE, Haynes RB. Patients compliance. In: Rakel RE, Ed. "Essentials of family practice Philadelphia", WB Saunders Company. 2013;103-118.
10. Adisa R, Fakeye T. Do diabetes-specialty clinics differ in management approach and outcome? A cross-sectional assessment of ambulatory type 2 diabetes patients in two teaching hospitals in Nigeria. *Ghana Medical Journal*. 2016;50(2):90-102 .
11. Dahiru T, Aliyu A, Shehu A. A review of population-based studies on diabetes mellitus in Nigeria. *Sub-Saharan African Journal of Medicine*. 2016;3(2):59. <https://doi.org/10.4103/2384-5147.184351>
12. Uloko AE, Musa BM, Ramalan MA, Gezawa ID, Puepet FH, Uloko AT, Borodo MM, Sada KB. Prevalence and Risk Factors for Diabetes Mellitus in Nigeria: A Systematic Review and Meta-Analysis. *Diabetes Ther*. 2018;9(3):1307-1316. DOI: 10.1007/s13300-018-0441-1. Epub 2018 May 14. PMID: 29761289; PMCID: PMC5984944.
13. World Health Organisation Management of Peripheral Arterial Disease, Geneva; 2011. Available: http://www.who.int/about/licensing/copyright_form/en/index.html
14. Nwaokoro JC, Okokon BE, Nwaokoro AA, Emerole CO, Ibe SNO, Onwuliri VA, Oputa RN, Chukwuocha UM. Problems associated with treatment compliance among type 2 diabetic patients at a tertiary health institution in Nigeria. *African Journal of Diabetes Medicine*. 2014; 22(1):1-3.
15. Abdulazeez FI, Omole M, Ojulari SL. Medication compliance amongst diabetic patients in Ilorin, Nigeria. *J. of Dental and Med. Sci*. 2014;13(3):96-99.
16. Ajibade BL, Abdullahi H, Oyedele EA. Factors militating against compliance with medical regimen among diabetic clients. *Int. Professional Nursing J*. 2010;8(1):13-18.
17. Brides V, Rapadas JAM, Sabella WR, Sanchez A, ThelShorette JM, Tan II L. Compliance of treatment management among diabetes patients. *International Peer Reviewed Journal*. 2012; 4(2094-9537). DOI:<http://dx.doi.org/10.7828/anrj.v4i1.204>.
18. Khan AR, Lateef ZNAA, Al Aithan MA, Bukhamseen MA, Al Ibrahim I, Khan SA. Factors contributing to non-compliance among diabetics attending primary health centers in the Al Hasa district of Saudi Arabia. *Journal of Family and Community Medicine*. 2012;19(1):26.
19. Murugesan N, Snehalatha C, Shobhana R, Roglic G, Ramachandran A. Awareness about diabetes and its complications in the general and diabetic population in a city in southern India. *Diabetes Res Clin Pract*. 2007;77(3):433–37.
20. Rwegerera GM. Adherence to anti-diabetic drugs among patients with Type 2 diabetes mellitus at Muhimbili National Hospital, Dar es Salaam, Tanzania- A cross-sectional study. *Pan African Medical Journal*. 2014; 17. <https://doi.org/10.11604/pamj.2014.17.252.2972>
21. Uloko AE, Obegbu EN, Chinenye S, et al. Profile of Nigerians with diabetes mellitus - Diabcare Nigeria study group (2008): Results of a multicenter study; 2012. <https://www.ncbi.nlm.nih.gov/pubmed/22837916>
22. Kassahun A, Gashe F, Mulisa E, Rike WA. Nonadherence and factors affecting adherence of diabetic patients to anti-diabetic medication in Assela General Hospital, Oromia Region, Ethiopia. *Journal of Pharmacy and Bioallied Sciences*. 2016; 8(2):124-9
23. Delamater AM, Improving patient adherence. *Clin Diabet*. 2006;24(2):71–7.
24. Bagonza J, Rutebemberwa E, Bazeyo w. Adherence to anti diabetic medication among patients with diabetes in eastern Uganda; a cross-sectional study. *Bio Med Central articles*. 2015;15:168. DOI: 10.1186/s12913-015-0820-5.
25. Khan AR, I-Abdul Lateef ZN, Al Aithan MA, Bukhamseen MA, Ibrahim I, Khan SA. Factors contributing to non-compliance among diabetics attending primary health centers in the Al Hasa district of Saudi Arabia. *Journal of Family and Community Medicine*. 2012;19(1):26-32
26. Ogbera OA, Kuku SF. Insulin use, prescription patterns regimens and cost-a narrative from a developing country,' *Diabetology and metabolic syndrome*. 2012;4(1):50
27. Rwegerera GM, Moshomo T, Rivera RP. Antidiabetic medication adherence and associated factors among patients in Botswana; implications for the future. *Alexandria Journal of Medicine*; 2017.
28. Healthy Caribbean Coalition (HCC) NCD Alliance. Non-Communicable disease

- poverty for women's health and development; 2011.
<http://www.iumsp.ch/Enseignement/colloques/do>.
29. Islam SMS, Niessleria W, Seissler J, Ferrari U, Biswas T, Anwar I, Lechner A. Diabetes knowledge and glycemic control among patients with type 2 diabetes in Bangladesh. Springer Plus. 2015;4:284.
 30. Adisa R, Fakeye TO. Treatment non-adherence among patients with poorly controlled type 2 diabetes in ambulatory care settings in southwestern Nigeria. African Health Sciences. 2014; 14(1):1-10
 31. Beverly A, Worley F, Court B, Prokopakis E, Ivanov N. Patient-Physician communication and diabetes self-care. Journal of clinical communication. 2013; 23(11):509-518
 32. Deerochanawong C, Ferrario A. Diabetes management in Thailand: a literature review of the burden cost and outcomes. Biomedical Central Articles. 2012;9:11

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Peer-review history:

The peer review history for this paper can be accessed here:
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