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KNOWLEDGE AND TREATMENT COMPLIANCE AMONG PEOPLE LIVING WITH DIABETES MELLITUS IN SELECTED SECONDARY HEALTHCARE FACILITIES IN IBADAN, OYO STATE, NIGERIA

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ABSTRACT: *Introduction: Compliance with treatment modalities is imperative to mitigate diabetes mellitus-related complications. However, compliance among these individuals living with diabetes mellitus has been low. Objective: This study assessed the knowledge and treatment compliance among people living with diabetes mellitus in a selected hospital in Ibadan, Oyo state, Nigeria. Methods: The study utilised a descriptive cross-sectional design. The population size was 190 patients attending Ring-Road State Hospital, Ibadan. Taro Yamane's formula was used to determine 100 sample size. Participants were selected using a random sampling (balloting) technique. A self-constructed questionnaire with Cronbach's Alpha Coefficient of .773 was used to collect data. Results: The response rate was 100%. Descriptive statistics was used to analyze the data using SPSS Version 26, and the results were presented with tables, frequencies, and simple percentages. The findings indicate 73(73%) of the respondents had poor knowledge about the risk factors associated with diabetes mellitus, 68(68%) had poor knowledge of diabetes mellitus management modalities, and 31% had poor level of treatment compliance. Conclusion/Recommendation: This shows that most people living with diabetes mellitus in Oyo state lack adequate understanding of diabetes mellitus and treatments modalities which reflects in their compliance level. Therefore, there is a need for health education and support systems across the state.*

KEYWORDS: Complications, Diabetes Mellitus, Knowledge, Treatment compliance, Treatment modalities.

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STATEMENT OF PROBLEM

The management of Diabetes mellitus is multidimensional and is highly effective. However, it has been reported that the treatment compliance among people living with diabetes mellitus has been very low (Doya et al., 2023). This is due to poor knowledge of the treatment regimen among the diabetic patients. Studies have shown poor knowledge among diabetic patients regarding the cause and treatment regimen of diabetes mellitus, 78.5% had poor understanding of diabetes, which would definitely affect the treatment compliance (Agofure et al., 2021; Oluwaseun et al., 2021). Compliance with treatment regimen was reported to be 57.1% and 65% at University of Benin Teaching Hospital, Nigeria, and 36.7% and 34.3% among patients with type 2 diabetes mellitus in Tanzania, and 41.8% in Botswana (Ehwarieme et al., 2018; Doya et al., 2023). Non-compliance may lead to poor health outcomes and increased healthcare costs (Fabrizi et al. 2020). Therefore, the study assessed the knowledge and treatment compliance among those attending the diabetic clinic at selected secondary healthcare facilities in Ibadan municipal.

Aim of the Study

This study aims to assess the knowledge and treatment compliance among those attending the diabetic clinic at selected secondary healthcare facilities in Ibadan, Oyo State, Nigeria.

Significance of the study

The findings of the study may be useful to an individual with diabetes mellitus. It will help improve the quality of life. Adhering to prescribed medications, insulin, and lifestyle modifications helps maintain consistent blood glucose levels, preventing fluctuations that can lead to short-term symptoms and long-term complications. Thus, effective diabetes management through treatment compliance can reduce stress and anxiety associated with the condition, positively impacting mental well-being. Compliance with diabetes management contributes to the individual's improved quality of life, thus positively influencing the overall well-being and quality of life for family members. Also, it improves productivity and health impact and reduces social and economic disparities in the community. The healthcare providers will gain insight into the need to educate patients on diabetes and management, thus enhancing compliance and health outcomes. Furthermore, it helps the policymaker in making preventive health care strategies, planning, and investing in healthcare infrastructure.

REVIEW OF LITERATURE/THEORETICAL UNDERPINNING

Diabetes Mellitus is a group of metabolic diseases characterized by increased levels of glucose in the blood (hyperglycaemia) resulting from defects in insulin secretion, insulin action, or both, leading to metabolic disorders of carbohydrates, protein, and fat, characterized by hyperglycaemia, degenerative vascular changes, and neuropathy. The International Diabetes Federation (2021) estimated that approximately 537 million adults (20-79 years) were living with diabetes mellitus globally, which is projected to rise to 643 million by 2030 and 783 million by 2045. Moreover, China has the highest number of people living with diabetes mellitus, with 116 million people of its population diagnosed with it, followed by India with 77 million people having diabetes, while the United States was the third with the statistics of 31 million people (IDF Diabetes Atlas, 2019). Also, the highest prevalence of diabetes mellitus

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was reported in Belgium with 16.6%, followed by Asia with 5.5%, and Australia having the lowest prevalence of 1.5%, respectively (Zhang et al., 2020). However, despite that, 54% of people living with diabetes in the region remain undiagnosed, making the region have the highest proportions among all the IDF regions (Magliano & Boyko, 2021). Furthermore, the overall pooled prevalence of diabetes mellitus according to Adeleye et al., (2021) was reported to be 5.77% in Nigeria, which makes diabetes mellitus an even larger health problem. Likewise, a study conducted at the Oke-Ogun geo-political zone of Oyo State revealed the overall prevalence of diabetes and pre-diabetes to be 4.6 and 6.0% respectively (Shittu et al., 2020). This alarming incidence calls for effective management and cautious compliance with the drug regimen by those living with diabetes mellitus.

Diabetes management is a dynamic and multifaceted process that relies heavily on the knowledge and understanding of individuals living with diabetes. Knowledge encompasses a vast array of information and understanding acquired through experience, study, or awareness. It empowers individuals to navigate challenges, make informed decisions, and progress. As Okafor et al., (2021) note, diabetes mellitus is a complex metabolic disorder that demands a comprehensive understanding from those affected to manage their condition effectively. Thus, the levels of knowledge among diabetes patients play a crucial role in shaping their ability to make informed decisions, adhere to treatment plans, and lead a healthy life. Central to diabetes management is the understanding of diverse treatment modalities of diabetes mellitus. Patients need to understand why regular blood glucose monitoring is crucial for assessing the effectiveness of their treatment plans. Knowledge of interpreting glucose readings enables patients to make real-time adjustments to their lifestyle, medication, or insulin dosages. Also, the knowledge of the glycemic index aids in making informed food choices, to prioritize low-GI foods to manage blood sugar levels effectively is imperative (Egwim, 2022). Furthermore, awareness of different diabetes medications and their mechanisms of action helps in adherence to prescribed regimens. Studies have shown that the majority of people living with diabetes mellitus lack adequate knowledge of diabetes mellitus and treatment regimes. A study by Agofure et al., (2021) showed poor knowledge among diabetic patients regarding the cause of diabetes mellitus, as the majority do not know that diabetes is hereditary and do not know the symptoms of DM. In addition, the majority erroneously affirm that DM could be cured, and less than half partially adhered to treatment.

Diabetic patients should be aware of the factors contributing to diabetes, including genetic predisposition, lifestyle choices, and environmental influences. Furthermore, understanding risk factors, such as obesity, sedentary lifestyle, and family history, empowers patients to make proactive health decisions. A study by Kumar et al., (2020) confirmed that respondents have a good level of knowledge about diabetes mellitus (DM) and the associated risk factors, symptoms, and chronic complications, while Oluwaseun et al., (2021) study showed that most respondents (78.5%) had poor knowledge of diabetes. Poor knowledge of diabetes mellitus treatment would definitely affect the treatment compliance of diabetes patients. Therefore, adequate knowledge of the treatment regimen is imperative for judicious compliance.

Also, Mansour et al., (2024) posit that knowledge and understanding the importance of adhering to medication schedules ensures optimal therapeutic effects, recognition of the psychological effects of diabetes, including stress, anxiety, and depression and equipping them with coping mechanisms and stress management techniques for maintaining emotional well-being will empowers individuals to make conscious and informed decisions about their food intake, contributing to better blood glucose control. Moreover, physical activity plays a crucial

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role in diabetes management, patients need to understand the positive impact of exercise on insulin sensitivity and overall health. Additionally, the importance of regular blood glucose monitoring cannot be overstated. The knowledge and skills to perform regular checks, interpret glucose readings, and make real-time adjustments to their treatment plans based on these readings are vital (Gupta et al., 2021). As Reynolds and Mitri (2024) noted, diet and lifestyle recommendations are cornerstones for the prevention and management of diabetes. Also, Baral et al., (2022) cited that diet is one of the essential treatment components and can lower glycated haemoglobin (HbA1c) levels by 1% to 2%. It also improves overall health, achieves and maintains body weight, attains individualized glycemic, blood pressure, and lipid levels. Also, it delays or prevents the complications of diabetes (Reynolds & Mitri, 2024).

Diabetes mellitus management requires long-term medical care, self-care practices, and lifestyle changes to maintain glycaemic control, improve overall quality of life, and prevent complications. These complications include hypertension, which can progress to heart failure, diabetic neuropathy, nephropathy, retinopathy, and diabetic foot, which is the common complication of diabetes mellitus (Mustapha, 2017). The condition is also associated with an increased morbidity and mortality, especially among those with type 2 diabetes (Doya, et al., 2023). This requires full compliance, which might be difficult for those living with diabetes mellitus to follow judiciously. However, treatment compliance is a critical aspect of diabetes mellitus management that requires the consistent and correct use of prescribed medications, including insulin, oral medications, regular exercise, dietary modifications, and self-monitoring of blood glucose (Bruner & Suddarth). Adherence to these treatment regimens can be challenging for many patients, leading to poor health outcomes and increased healthcare costs. (Fabrizi et al., 2020).

Poor treatment compliance has been reported among those living with diabetes mellitus. For example, a study by Doya et al., (2023) reported low treatment compliance of 36.7% and 34.3% among patients with type 2 diabetes mellitus in Tanzania and 41.8% in Botswana. Also, a study by Ehwarieme et al., (2018) to determine treatment compliance among diabetic patients revealed poor treatment compliance of 57.1% at University of Benin Teaching Hospital (UBTH) and 65% at Central Hospital, Benin. The findings also show that 42.9% of respondents attending UBTH had good treatment compliance, same with and 35% of the respondents from Central Hospital, Benin. Furthermore, a study by Imuran and Plathottam (2017) to assess treatment compliance among diabetic patients revealed that 54.8% (80) of participants were adherent, whilst 45.2% (66) were non-adherent. Similarly, as cited by Pourhabibi et al., (2022) in their study on factors affecting non-adherence to treatment among type 2 diabetic patients with limited health literacy: Perspectives of patients, their families, and healthcare providers, 38% of patients with type 2 diabetes did not comply with treatment during the first year of the disease. This poor compliance with the treatment regimen among diabetic patients has been identified to result from poor knowledge of diabetes mellitus, inadequate understanding of diabetes mellitus management, and socioeconomic status, including a lack of family support (Masaba & Mmusi-Phetoe, 2021). Studies have shown that patients who can afford the recommended diet are almost 3 times more likely to adhere to the diet than those who cannot afford it (Baral et al., 2022). However, many people living with diabetes are not complying with dietary management. For instance, a study by Baral et al., (2022) on dietary adherence reported that only 15.7% of 204 participants had good dietary adherence, with 14.29% and 12.9% at Kathmandu and Dhaka, Bangladesh, respectively. Mohammed & Sharew (2019) also

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reported that 55.7% of the participants were found to be non-compliant with the dietary approach.

Therefore, it is important to assess the knowledge and treatment compliance among those attending the diabetic clinic at selected secondary healthcare facilities in the Ibadan municipal area.

Theoretical Framework

COM-B Model

The Capability, Opportunity, Motivation, and Behaviour (COM-B) model is a comprehensive behavioural change framework that emerged from the need to address the limitations of existing behaviour change theories and interventions. The COM-B model, developed by Michie et al. in 2011, is a comprehensive framework designed to understand the factors that influence behaviour change.

The model was created as part of a broader effort to develop more effective and systematic approaches to behaviour change interventions in healthcare and public health settings. The COM-B model was primarily developed by Susan Michie, Maartje van Stralen, & Robert West, inventors of the COM-B Model at University College London (UCL). COM-B is the result of a research effort, led by Prof Susan Michie and colleagues at University College London, to develop a robust and comprehensive tool to diagnose barriers to behaviour change. The COM-B model of behaviour is widely used to identify what needs to change in order for a behaviour change intervention to be effective. It identifies three factors that need to be present for any behaviour to occur: capability, opportunity and motivation. The model posits that for any behaviour (B) to occur, three essential components must be present: Capability (C), Opportunity (O), and Motivation (M). Together, these components create a foundation for behaviour change.

Capability (C): The individual's psychological and physical capacity to engage in the activity concerned. Capability encompasses both the physical ability and mental capacity needed to perform a specific behaviour. Physical capability includes the motor skills, strength, dexterity, and bodily functions required, while psychological capability involves having the necessary knowledge, cognitive skills, memory, and attention to execute the behaviour. Without adequate capability in either domain, individuals cannot successfully engage in the desired behaviour regardless of their motivation or available opportunities.

Opportunity (O): The physical and social environment that enables the behaviour. Opportunity refers to the external factors that make a behaviour possible or prompt its occurrence within a given context. Physical opportunity includes environmental resources, facilities, time availability, and situational triggers that either facilitate or hinder behaviour performance. Social opportunity encompasses interpersonal influences, cultural norms, organizational policies, and social support systems that either encourage or discourage the behaviour. For instance, hand hygiene opportunity requires access to handwashing facilities and sanitizers (physical) as well as supportive workplace culture and peer modeling (social).

Motivation (M): The brain processes that energize and direct behaviour. Motivation represents the internal psychological processes that drive individuals toward or away from performing specific behaviours. It includes both reflective motivation (conscious decision-making,

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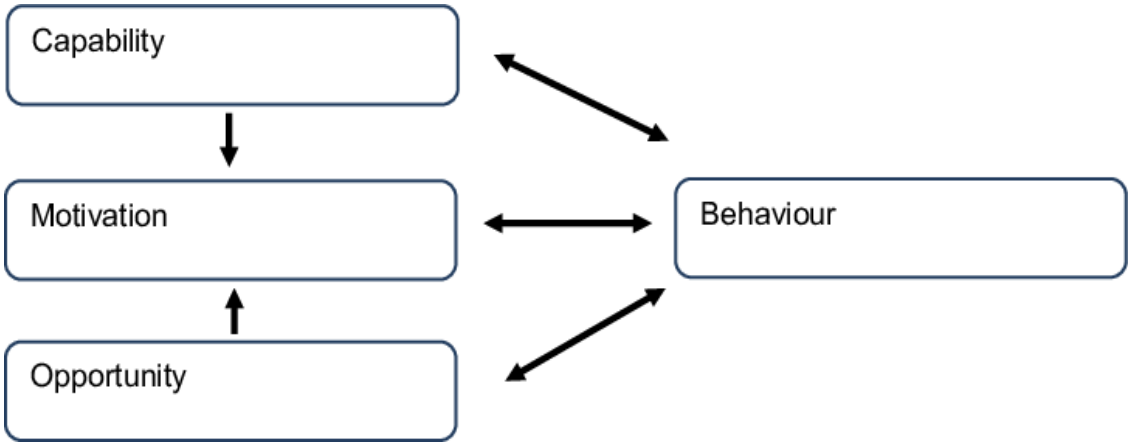
intentions, beliefs about consequences, and planned actions) and automatic motivation (emotions, impulses, habits, and subconscious responses). Reflective motivation involves deliberate thinking about the benefits and costs of consistent compliance with treatment regimen, while automatic motivation open through learned associations and emotional responses, which are to dealt with by an individual to enable consistent compliance. Both reflective and automatic motivation plays crucial role in treatment compliance.

The COM-B model serves as the central hub of the Behaviour Change Wheel (BCW), a more comprehensive framework for designing behaviour change interventions. Interventions and policies to change behaviour can be usefully characterised by means of a BCW comprising: a 'behaviour system' at the hub, encircled by intervention functions and then by policy categories. The BCW provides a systematic method for linking behavior analysis to intervention design and policy development.

Fig 1: Theoretical framework of COM-B model of Behaviour (Michie et al., 2011)



Application of the model to the study

The COM-B model is a comprehensive behavioural change framework that emerged from the need to address the limitations of existing behaviour change theories and interventions. The COM-B model, developed by Michie et al. in 2011, is a comprehensive framework designed to understand the factors that influence behaviour change.

This model helps people living with diabetes mellitus understand the disease and the management modalities such as diet, exercise, self-monitoring of blood glucose, medications compliance.

Capability: this is the ability of people living with diabetes mellitus to have the physical and psychological ability needed to consistently comply with the treatment regimen, including motor skills, strength, necessary knowledge, cognitive skills, memory, and attention. Without adequate capability, individuals cannot engage in treatment regimen compliance consistently.

Opportunity: The physical and social environment that enables the behaviour. Opportunity refers to the external factors that make a behaviour possible or prompt its occurrence within a given context. This includes proper health education by the healthcare providers and social support systems such as family members, non-governmental organisation and the government.

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This will influence consistent compliance with the treatment regimen among people living with diabetes mellitus.

Motivation: The brain processes that energize and direct behaviour. Motivation represents the internal psychological processes that drive individuals toward or away from performing specific behaviours. Reflective motivation involves deliberate thinking about the benefits of complying with a treatment regimen, such as good health outcomes, mitigation of complications, quality of life, and increased life expectancy. Reflection on the costs can also determine whether an individual living with diabetes mellitus will consistently comply with the treatment regimen or not.

Therefore, the COM-B model serves as a blueprint for this study. It highlights the necessary knowledge, cognitive skills, memory, and attention to comply with the treatment regimen. Opportunities such as proper health education by the healthcare providers and social support systems, especially from family members, can encourage treatment compliance. Motivation in terms of deliberate thinking about the benefits of complying with a treatment regimen, such as good health outcomes, mitigation of complications, quality of life, and increased life expectancy.

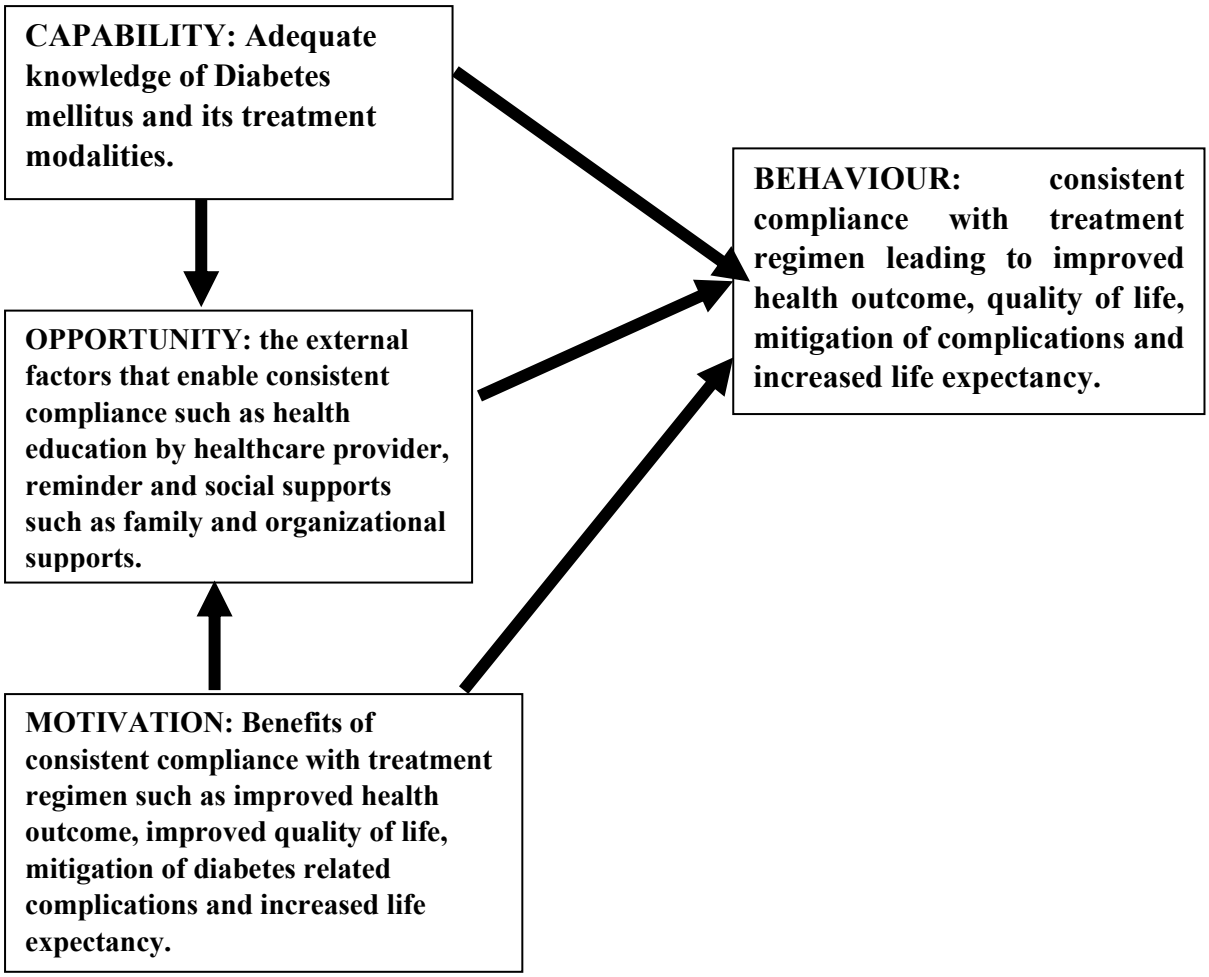

Fig 2: Conceptual framework adapted from COM-B model (Michie et al., 2011)

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METHODOLOGY

Research Design

The study utilised a descriptive cross-sectional design to determine the knowledge and compliance with treatment regimen among people living with diabetes mellitus.

The Study Setting

The research was carried out at Ring Road State Hospital off M.K.O Abiola Way in Ibadan South East Local Government Area. It was established and officially opened on 23rd March, 1971 by His Excellency, Brigadier Robert Adeyinka Adebayo, who was the military Governor of the Western state of Nigeria. Health workers working in the hospital comprise both male and female Nurses, Doctors, Pharmacists, Laboratory scientists, Technicians etc., of different ages and tribes, and were about 220. It has various departments which are; Out-patient, Male medical and surgical ward, Female medical and surgical ward, Renal ward, Labor ward, Ante-natal ward, Theatre, X-ray department, Eye clinic, Laboratory, Psychiatric ward, Laundry and cleaning, Pharmacy, HIV counseling unit, Dental unit, Maxillofacial unit, Family planning, Account unit, Pathology unit, Orthopedic ward, Haematologic unit, Administrative unit and record departments and it consists of 209 bed space.

Study Population

This comprises patients living with diabetes mellitus and has been attending the diabetic clinic for follow-up.

Inclusive and exclusive criteria

The participants were patients living with diabetes mellitus and were available at the time of data collection, and gave their consent, while those who were not diabetic were excluded from the study.

Sample size determination

Taro Yamane‘s formula was used to calculate the sample size since the population size was known (190). The sample size used for the study were100 participants.

Sampling Procedure: A simple random sampling technique (balloting) was used to select the participants.

Data collection tools

The instrument for data collection was a self-constructed and validated questionnaire developed by the researchers based on a review of relevant literature and objectives of the study. It was used to collect information on the level of knowledge and the treatment compliance among people living with diabetes mellitus.

Validity of the Instrument

The questionnaire was reviewed using face and content validity. The instrument was reviewed by an expert in research and research methodology. The instrument was subjected to face

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validity for clarification and evaluation of the questions and content validity to ensure appropriateness of the questionnaire.

Reliability of the Instrument

Reliability of the instrument was determined using the internal consistency reliability method with 10% of sample size (10) among those attending Aremo General Hospital, Ibadan. The alpha coefficient reliability was 0.773

Data Collection Technique

A self-developed questionnaire was used to elicit information from the participants on the level of knowledge of diabetes mellitus, the level of knowledge of diabetes mellitus treatment modalities, and the level of treatment compliance among diabetic patients. Prior to the data collection, ethical approval was obtained from the appropriate authority, and informed consent was secured from eligible participants. The questionnaires were administered to patients attending the diabetic clinic during clinic days. The questionnaires had four (4) sections (A-D).

Measurements of Variables

Section A: Demographic data of the respondent.

This section consists of 6 items, which were used to elicit information on demographic data of the respondents, including age, religion, gender, marital status, general health status, and duration since diagnosis with diabetes mellitus

Section B: Knowledge of diabetes mellitus among diabetic patients.

This section assessed participants' knowledge of diabetes mellitus, and it comprises 7 items, which require the respondent to answer Yes or No. The correct answer was awarded 1 mark, and the wrong answer was awarded 0. The total score was 7 marks. The maximum obtainable score was 7 marks, and the minimum score was 1 mark. The score was classified into 3 (poor, fair, and good levels of knowledge), in which 1-2 was regarded as a poor level of knowledge, 3-4 was regarded as a fair level of knowledge, and 5-7 as a good level of knowledge.

Section C: Knowledge of diabetes management among diabetic patients

This section assessed participants' knowledge of diabetes management among the respondents. It comprises 15 items that require the respondent to answer Yes or No. The correct answer was awarded 1 mark, and the wrong answer was awarded 0. The items (questions) were 12 in number, and the total score was equal to 12 marks. The maximum obtainable score was 15 marks, and the minimum score was 1 mark. The score was classified into 3 (poor, fair, and good levels of knowledge), in which 1-5 was regarded as a poor level of knowledge, 6-10 regarded as a fair level of knowledge, and 11-15 regarded as a good level of knowledge.

Section D: Level of Compliance with the treatment regimen among diabetic patients

This section assessed information on the level of treatment compliance among the respondents. It was measured using a 4-point Likert scale: Never, Rarely, Sometimes, and Always. The scores were classified into 4, (poor, fair, good, and excellent), with 1-10 regarded as a poor level of treatment compliance, 11-20 as a fair treatment compliance, 21-30 as a good treatment

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compliance, and 31-40 as an excellent treatment compliance. It consists of 10 items, making the total score 40.

Data Processing and Analysis: The data were coded, cleaned, and exported into SPSS version 26 for statistical analysis. First, descriptive statistics were generated. Chi-square test was used to determine the possible association between the determinant and the outcome variable. A P-value of less than 0.05 was considered statistically significant.

Ethical Considerations: This study was approved by the ethical review committee of the College of Nursing Sciences, Eleyele, Ibadan, Oyo State, Nigeria. An official letter of permission was provided to the administrative office of the hospital. The respondents were informed about the purpose of the study, and written informed consent was obtained from each study participant. They were also informed that they are free to withdraw at any stage if they are not comfortable with the questions. Information obtained was kept anonymous.

RESULTS/FINDINGS

Table 1: Socio-demographic characteristics of the respondent (N=100)

Variables	Categories	Frequency	Percent (%)
Age	18-25	13	13
	26-35	14	14
	36-45	19	19
	46-55	24	24
	56 years & above	30	30
	Total	100	100
Religion	Islam	48	48
	Christianity	52	52
	Traditional	0	0
	Total	100	100
Gender	Male	52	52
	Female	48	48
	Total	100	100
Marital status	Married	79	79
	Single	21	21
	Divorced	0	0
	Total	100	100
Health status	Excellent	28	28
	Good	49	49
	Fair	23	23
	Poor	0	0
	Total	100	100
Duration Since Diagnosis of Diabetes Mellitus	Less than 1 year	34	34
	1-5 years	35	35
	6-10 years	30	30
	More than 10 years	1	1
	Total	100	100

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Table 1 above shows the age group distribution of the respondent in which, 13(13.0%) were within the age range of 18-25 years, while 14(14.0%) were within the age range of 26-35, 19(19.0%) were within the age range of 36-45, the age distribution shows a relatively balanced representation across different age groups, with the majority falling between 46-55 and 56 & above, each comprising (24%) and (30%) respectively. The majority (52%) of respondents identified as Christians, while 48% identify as Muslims.

The gender distribution was almost evenly split, 48% were female, and 52% were male. The few 21% of respondents were single, while the vast majority (79%) were married. (23%) of the respondents rated their health as fair, 28% rated it as excellent, while 49% rated it as good.

The duration of diagnosis shows a relatively even distribution, 34(34%) were diagnosed in less than 1 year, and 35(35%) were diagnosed between 1-5 years. 30(30%) have been diagnosed for 6-10 years, and only 1(1%) has been diagnosed for more than 10 years.

Table 2: Level of knowledge on diabetes mellitus among diabetic patients

Variable	Response	Frequency (n)	Percentage (%)
Knowledge of the different types of diabetes mellitus	Poor	67	67
	Good	33	33
	Total	100	100
Awareness of the risk factors associated with diabetes mellitus	Poor	73	73
	Good	27	27
	Total	100	100
Familiarity with the various treatment options for diabetes mellitus	Poor	46	46
	Good	54	54
	Total	100	100
Knowledge of the signs and symptoms of hyperglycaemia	Poor	64	64
	Good	36	36
	Total	100	100
Knowledge of the signs and symptoms of hypoglycaemia	Poor	64	64
	Good	36	36
	Total	100	100
Knowledge of blood glucose monitoring	Poor	64	64
	Good	36	36
	Total	100	100
Awareness of the potential complication associated with diabetes mellitus	Poor	65	65
	Good	35	35
	Total	100	100

Table 2 above shows that only (33%) of the respondents demonstrated adequate knowledge of types of diabetes mellitus. However, (73%) lacked awareness of the risk factors. Slightly more than half (54%) were familiar with various treatment options for diabetes mellitus. Additionally, many of the respondents (64%) lack understanding of the signs and symptoms of hypoglycaemia and hyperglycaemia. Only (34%) were knowledgeable about self-monitoring of blood glucose (SMBG). Furthermore, (65%) of them were not aware of the potential complications associated with diabetes mellitus.

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Table 3: Level of Knowledge of Diabetes Management among Respondents (N=100)

Variable	Response	Frequency (n)	Percentage (%)
Knowledge of the importance of monitoring blood glucose levels regularly	Poor	43	43
	Good	57	57
	Total	100	100
Knowledge of recommended fasting blood glucose targets	Poor	51	51
	Good	49	49
	Total	100	10
Knowledge of recommended postprandial blood glucose readings	Poor	67	67
	Good	33	33
	Total	100	100
Awareness of the different types of insulin used in managing diabetes	Poor	68	68
	Good	32	32
	Total	100	100
Awareness of the different types of oral medications used in managing diabetes	Poor	51	51
	Good	49	49
	Total	100	100
Knowledge of the diet role in managing diabetes	Poor	29	29
	Good	71	71
	Total	100	100
Compliance with recommended dietary plan for diabetes management	Poor	58	58
	Good	42	42
	Total	100	100
Familiarity with the importance of carbohydrate counting in diabetes management	Poor	59	59
	Good	41	41
	Total	100	100.0%
Awareness of hypoglycemia recognisation	Poor	61	61
	Good	39	39

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	Total	100	100
Knowledge of how to recognize hyperglycemia	Poor	50	50
	Good	50	50
	Total	100	100
Knowledge of how to correct hypoglycemia	Poor	57	57
	Good	43	43
	Total	100	100
Knowledge of how to correct hyperglycemia	Poor	53	53
	Good	47	47
	Total	100	100
Awareness of the importance of regular physical activities in managing diabetes	Poor	49	49
	Good	51	51
	Total	100	100
Familiarity with the latest technology and devices used in diabetes management	Poor	55	55
	Good	45	45
	Total	100	100
Having a structured self-management plan for diabetes	Poor	55	55
	Good	45	45
	Total	100	100

The results showed that (57%) of respondents understood the reason for self-monitoring of blood glucose. Slightly less than half (49%) knew the recommended target blood glucose levels for fasting blood sugar level. However, (67%) did not know the recommended target blood glucose levels for postprandial readings. A substantial proportion (68%) were unaware of the different types of insulin used in diabetes management, and 51% were not aware of the different types of oral medications used in diabetes management. Although (71%) of respondents knew the role of diet in managing diabetes mellitus, only (42%) were following a recommended dietary plan for diabetes management. Only 41% were familiar with the importance of carbohydrate counting in diabetes management.

Only (39%) and (50%) knew how to recognise signs of hypoglycaemia and hyperglycaemia respectively. Also, (43%) and (47%) of the respondents knew how to correct hypoglycaemia and hyperglycaemia respectively. Almost half (51%) understood the effect of regular physical exercise in blood sugar control. More than half (55%) were unfamiliar with the latest technology and devices used in diabetes management, such as continuous glucose monitors.

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Similarly, (55%) of the respondents did not have a structured self-management plan for diabetes, that includes monitoring, medication, diet, exercise, and stress management.

Table 4: The Level of Treatment Compliance Among Respondents (N=100)

Variable	Response	Frequency (n)	Percentage (%)
Consistent use of medications as prescribed	Never	23	23
	Sometimes	34	34
	Always	43	43
	Total	100	100
Monitoring of blood glucose levels regularly	Never	30	30
	Sometimes	25	25
	Always	45	45
	Total	100	100
Compliance with check-ups as planned	Never	13	13
	Rarely	20	20
	Sometimes	09	09
	Always	58	58
	Total	100	100
Facing many challenges in following diabetes treatment plan	Never	10	10
	Rarely	10	10
	Sometimes	70	70
	Always	10	10
	Total	100	100
Availability of support system to help stay compliant with diabetes treatment	Never	40	40
	Rarely	10	10
	Sometimes	10	10
	Always	40	40
	Total	100	100
Experiencing many side effects and concerns with diabetes medications	Sometimes	60	60
	Always	40	40
	Total	100	100
Regular use of prescribed medications	Never	11	11
	Rarely	18	18
	Sometimes	51	51
	Always	20	20
	Total	100	100
Regular check of blood sugar levels	Never	20	20
	Rarely	10	10
	Sometimes	30	30
	Always	40	40
	Total	100	100
Engaging in exercise as part of diabetes management plan	Never	31	31
	Rarely	10	10
	Sometimes	39	39
	Always	20	20
	Total	100	100

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Table 4 shows that a substantial number, 43% of respondents, had never missed their medications. Also, 36% had never monitored their blood glucose level since diagnosis. Likewise, (58%) always attend follow-up visits. Furthermore, a significant portion (70%) of respondents sometimes face challenges in following their diabetes treatment plan.

Regarding social support, (40%) of respondents always have a support system in place to help them stay compliant with their diabetes treatment, while the same percentage never or rarely have a support system.

Concerning medication-related issues, (40%) reported always experiencing side effects and concerns with their diabetes medications, whereas (60%) of respondents sometimes experienced side effects and concerns with their diabetes medications.

Only 40% of respondents always check their blood sugar levels, and only 20% of respondents always engage in exercise as part of their diabetes management plan.

DISCUSSION

Socio-demographic Data

The results of this finding on the demographic characteristics showed a relatively balanced age distribution across different age groups, with the majority falling between 46-55 and 56 years & above. This shows that the disease is more prevalent among young adults and the elderly in this healthcare facility. The gender distribution among the participants was almost evenly split, with 52% male and 48% female. The vast majority of respondents were married (79%). The majority, (49%) of respondents rated their health as good. The duration of diagnosis shows a relatively even distribution, with the majority falling between 1-5 years, with a smaller proportion being diagnosed for 6-10 years. This is in line with a study conducted by El Sayed et al., (2023) and Shabaraya et al. (2024), where the majority 54% were male and 46% were female, respectively. 67% were married while 18% were single. Educational level results showed that the majority of respondents were of middle and primary education, while 20% were highly educated, 22.5% had primary education, while 31.5% were illiterate. This shows that the disease is rampant among the non-educated class. Therefore, there is a need for healthcare workers and the government to create awareness of diabetes mellitus to avert high prevalence.

The Knowledge of diabetes mellitus among diabetes mellitus patients

A significant majority, 67% of the respondents, had poor knowledge of diabetes mellitus, indicating a lack of understanding about the classification of the disease. A substantial number (73%) of the respondents had poor knowledge about the risk factors associated with diabetes mellitus, suggesting a potential lack of knowledge about preventive measures. This is in line with a study conducted by Kalra et al., (2024), in which, amongst 67 participants, 17% could explain what is meant by Diabetes Mellitus. Only 13.4% had correct knowledge for Diabetes screening; while 37.3% were aware that the urine sugar test can be used for screening of Diabetes and none of them knew about Hb1AC. Around half of the participants knew organs affected by diabetes like eye, foot, and kidney. Generally, this study shows that the respondents have poor knowledge, while only (35%) had good knowledge about the potential complications

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associated with diabetes mellitus, highlighting a lack of awareness about the long-term consequences of the disease. Also, another study conducted by Shabaraya et al., (2024) shows the mean knowledge score of 3.03±1.85, 31% were found to have good knowledge, and 23% were found to have an average level of knowledge, while 46% had poor knowledge. Furthermore, according to Adhikari et al., (2023), only 27.2% of the respondents had good knowledge of diabetes, while a greater percentage, 72.8%, had poor knowledge. Likewise, in a study conducted by Luambano (2023), a total of 64.01% of the participants were knowledgeable about diabetes mellitus. The majority of study participants (86.9%) had knowledge of complications of diabetes mellitus, followed by knowledge on treatment options for diabetes (n= 182; 85.1%) and causatives of diabetes (n=171; 79.9%). Janani et al., (2024) report that adequate knowledge of diabetes was found in 63.7% of participants, with 86.8% understanding diabetes symptoms and 79.4% being knowledgeable about diabetes management. Moreover, Ashna et al., (2025) revealed in their study that the mean diabetes knowledge score was 13.18 ± 3.73 and that diabetes knowledge did not show any significant association with medication adherence.

The knowledge of diabetes mellitus management among diabetes mellitus patients

This study's results revealed that the majority of the participants (68%) had poor knowledge of diabetes mellitus management modalities. They did not know the different types of insulin used in diabetes management. Above average (55%) had poor knowledge of having a structured self-management plan for diabetes that includes monitoring, medication, diet, exercise, and stress management, indicating a need for comprehensive care planning and education. The majority (61%) had poor knowledge of how to recognize and correct hypoglycaemia (61% and 57% respectively). This is in tandem with a study conducted by Yahaya et al., (2023), where the respondents had poor knowledge of glycemic control. Also, as reported by Olatona et al., (2019), the percentage of patients with good nutritional knowledge was 27 %, which was lower than that of the Nigerian population with 37%. Similarly, as reported by Johnson et al., (2025), the average score for knowledge was 11.37/24 ± 3.40 or 47%, indicating poor levels of diabetes self-management knowledge. Furthermore, the findings of Agofure et al., (2020) showed poor knowledge, as 64.8% erroneously affirmed that DM could be cured, and 79.2% admitted not knowing the symptoms of DM. This implies that health education concerning diabetes mellitus treatment is imperative to aid treatment compliance and diabetes control among people living with the disease.

Treatment compliance among diabetes mellitus patients

The findings showed that 31% had a poor level of treatment compliance, and the majority (39%) had a good level of treatment compliance. Similarly, regarding taking medications, 11% had a poor level of treatment compliance, 18% had a fair level of treatment compliance, (51%) had a good level of treatment compliance, and 20% had an excellent level of treatment compliance. This is in line with a study conducted by Nurumal et al., (2020), which reported that the incidence of poor medication adherence in patients with T2D ranged widely from 38% to 93%. In another study by Mannan et al., (2021), the overall prevalence of low medication adherence was 46.3% (95% CI: 41.4-55.8%) of the study population. In a study done by Jeyalakshmi et al., (2023). 80% of study participants had moderate adherence to diet, and only 37.8% of them practiced physical exercise. Also, Agofure et al., (2020) reported in their findings that adherence to treatment among the study participants was suboptimal, as only 46.4% of the respondents strictly adhered to treatment. Meanwhile, Ashna et al., (2025) in

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their findings revealed that more than half of the participants (63.2%) had perfect medication adherence. This shows that the need for support systems by the healthcare professionals, governmental, and non-governmental agencies cannot be underestimated, as this is to enhance treatment compliance among people living with diabetes mellitus, to mitigate the development of complications that can impair their quality of life and life expectancy.

IMPLICATIONS TO RESEARCH AND PRACTICE

The study on the knowledge and treatment compliance among people living with diabetes mellitus has several implications for the nursing profession:

- Tailored Education: Nurses can customize education and support based on individual patient knowledge gaps, empowering patients to manage their condition effectively.
- Improved Self-Management: Enhanced knowledge can lead to better self-management behaviours, such as medication adherence, dietary choices, and regular monitoring of blood glucose, exercise, and reducing the risk of complications.
- Prevention and Early Intervention: Nurses can use their findings to identify patients at risk of poor diabetes management early on, allowing for timely interventions to prevent complications.
- Enhanced Communication: Understanding patient knowledge levels enables nurses to communicate more effectively, using language and concepts that patients can comprehend, leading to improved patient-provider relationships.
- Patient Empowerment: By increasing patients' understanding of their condition, nurses empower them to actively participate in their care decisions, fostering a sense of control and ownership over their health barriers.
- Monitoring and Support: Regular monitoring of treatment adherence by nurses can identify patterns of non-compliance early on, allowing for timely interventions and support to address barriers and challenges.
- Collaborative Care: Nurses can collaborate with other healthcare professionals, such as physicians, pharmacists, and dieticians, to provide comprehensive care that addresses all aspects of treatment adherence, including medication management, lifestyle modifications, and self-monitoring.
- Technology Integration: Nurses can leverage technology, such as mobile apps, telehealth platforms, and wearable devices, to enhance patient engagement, education, and monitoring, facilitating better treatment compliance and outcomes.

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CONCLUSION

This study shows that there is poor knowledge of diabetes mellitus and its management modalities, as well as poor treatment compliance among people living with diabetes mellitus. Hence, there is an urgent need for an intervention programme to boost their knowledge and compliance in Oyo State, Nigeria. Effective interventions, which may include patient education programs, social support initiatives, healthcare system reforms to improve access and affordability, and psychological support services, will enhance treatment compliance.

FUTURE RESEARCH

1. Longitudinal Studies on Treatment Adherence: Conduct longitudinal studies to track treatment adherence among diabetes mellitus patients over an extended period. Investigate how adherence patterns change over time and identify factors influencing long-term compliance.

2. Effectiveness of Digital Health Interventions: Evaluate the effectiveness of digital health interventions, such as mobile apps, wearable devices, and telemedicine platforms, in improving treatment compliance among diabetes patients. Compare different intervention strategies and their impact on adherence rates.

3. Qualitative Research on Patient Perspectives: Conduct qualitative research to explore diabetes patients' perspectives on treatment compliance to understand patients' experiences, perceptions, and challenges related to adhering to treatment regimens.

4. Impact of Socioeconomic Factors: Investigate the influence of socioeconomic factors, such as income, education, employment status, and access to resources, on treatment compliance among diabetes patients.

5. Peer Support Interventions: Explore the effectiveness of peer support interventions in promoting treatment compliance among diabetes patients. Evaluate peer-led programs, support groups, and mentorship initiatives in enhancing self-management skills and motivation.

6. Health Literacy Interventions: Develop and evaluate health literacy interventions aimed at improving treatment understanding, medication adherence, and self-management skills among diabetes patients. Test the effectiveness of educational materials, health coaching programs, and health literacy training for healthcare providers.

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