Original Research Article

Assessment of Nutritional Status, Care and Support among Type 2 Diabetic Outpatients in Selected Hospitals within Kaduna Metropolis, Nigeria

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Abstract

Diabetes mellitus is a significant public health concern and a worldwide health hazard, with scientific research suggesting that an individual's nutritional status plays a role in its development. The presence of familial support has been found to be linked with enhanced coping mechanisms, higher quality of life, improved management of diabetes, and better overall health outcomes, which includes the prevention of complications. The present study aimed to evaluate the nutritional status, care, and support provided to outpatients with type 2 diabetes in specific hospitals located within the Kaduna Metropolis. The study employed a descriptive cross-sectional design, encompassing a sample size of 280 individuals diagnosed with diabetes. The Mini Nutritional Assessment (MNA) tool was utilised to collect data pertaining to socio-demographic characteristics, dietary patterns, health-related complications, and lifestyle patterns. The researchers collected anthropometric measurements, including weight (in kilograms) and height (in meters). They then calculated the body mass index (BMI) by dividing the weight by the square of the height (in kilograms per square meters). The nutritional status indices were classified according to the standards set by the World Health Organisation (WHO). The data were subjected to analysis using the Statistical Package for the Social Sciences (SPSS), with a predetermined level of significance set at P<0.05. The results indicate that a majority of the participants, specifically 69.64%, reported consuming fruits on a daily basis, while 32.14% reported consuming vegetables daily. The near half of participants (50.71%) exhibited normal weight, while 13.92% were classified as underweight, 19.64% as overweight, and 15.71% as obese. The primary complication encountered by the respondents was hypertension, with a prevalence rate of 36.07%. The research findings indicated a significant prevalence of familial and partner involvement in the care and support of individuals diagnosed with diabetes mellitus. The study demonstrated a statistically significant association (p<0.05) between nutritional status and various factors, including occupation, religion, age, education, marital status, and monthly income. It is advisable to implement screening protocols for diabetic complications as a means of mitigating the risk of malnutrition among individuals with diabetes. Further investigation is warranted to explore the efficacy and obstacles associated with familial and partner assistance for individuals receiving medical care.

Keywords: Assessment, Care and Support, Diabetes Mellitus, Nutritional Status, Outpatients

INTRODUCTION

Diabetes mellitus is widely recognized as a significant contributor to both morbidity and mortality on a global scale. The complications of this condition have an impact on various organ systems and can significantly influence the well-being of patients across multiple domains, including physical, psychological, social, and environmental aspects (Steinfath et al., 2018).

Diabetes mellitus is a metabolic disorder that is distinguished by persistent hyperglycemia and disruptions in the metabolism of carbohydrates, fats, and proteins. It arises from impairments in insulin secretion, insulin action, or both (Mohammed et al., 2017; WHO, 2018; WHO, 2015; Wahome and Kiboi, 2016; Mohamed, 2018). Diabetes Mellitus encompasses various classifications, including type 1, type 2, maturity-onset diabetes of the young (MODY), gestational diabetes, neonatal diabetes, and secondary causes resulting from endocrinopathies or steroid usage, among others (Sapra and Bhandari, 2021).

Type 2 Diabetes, also known as Non-Insulin Dependent Diabetes Mellitus (NIDDM), arises from the resistance of body cells to insulin, which may be accompanied by a relatively diminished secretion of insulin. The aforementioned type is widely prevalent (Zanetti, 2017; Ansari et al., 2019). Insulin is frequently found in substantial quantities under normal circumstances. The pancreatic function of insulin production exhibits a decline in efficiency. Individuals diagnosed with type 2 Diabetes are required to administer exogenous insulin in order to overcome the resistance to their endogenous insulin (Wahome and Kiboi, 2016).

Diabetes mellitus (DM) is a multifaceted and enduring medical condition necessitating ongoing management, and it stands as one of the most significant global health challenges. The global population of individuals diagnosed with diabetes is estimated to be 463 million, with projections indicating a 51% increase to reach 700 million by the year 2045 (Cho et al., 2017).

The projected estimate for the number of adults with diabetes mellitus in Africa by the year 2020 is 24 million. The prevalence of diabetes mellitus (DM) in Nigeria exhibits a range of values, with a reported rate of 5.8% in the rural Mangu village and a higher rate of 11% in the urban area of Lagos (Ugwu et al., 2020). According to the World Health Organisation (WHO, 2016), Nigeria is reported to have the highest prevalence of individuals living with diabetes in Africa. It is estimated that approximately 3.4 million people in Nigeria are affected by this condition, and this number is projected to rise to 4.8 million by the year 2030 (Adeleye, 2021).

According to the World Health Organisation (WHO, 2016), the prevalence of type 2 diabetes in Sudan was estimated to be 3.5% among males and 3.4% among females. According to the World Health Organisation (WHO, 2016), the estimated prevalence of diabetes and its associated risk factors is as follows: diabetes, overweight, and obesity have prevalence rates of 6.6%, 25.0%, and 6.6% respectively (Mohamed, 2018).

Hyperglycemia has the potential to result in long-term, irreversible harm to bodily tissues. The long-term complications associated with diabetes encompass nephropathy, retinopathy, neuropathy, cardiovascular diseases, peripheral vascular diseases, delayed healing, periodontal diseases, stroke, and blindness (Tunrayi, 2013; Sima and Glogauer, 2013).

The nutritional status of individuals is determined by the manner in which nutrients are utilised, which in turn affects their overall health condition. The determination of a medical condition's cause relies solely on the correlation of information obtained from a comprehensive medical and dietary history, as well as the use of physical examinations and relevant laboratory investigations (Singh et al., 2015). The study of nutrition plays a crucial role in the management of diabetes and the education of individuals in self-care practices, with the ultimate goal of achieving and sustaining optimal metabolic outcomes. Singh et al. (2015) have reported findings from cross-sectional studies conducted in Africa.

Social support, as identified by Wu et al. (2011), family support, as indicated by Shawon et al. (2016), and support for health personnel and the health service system, as highlighted by Okemah et al. (2018), are external factors that exert an indirect influence on glycemic control in individuals with diabetes mellitus.

The majority of diabetes care occurs within the households where patients reside, and this environment significantly impacts the behaviours related to diabetes management (Mphasha et al., 2021). Previous research has demonstrated that the psychological well-being, medication adherence, and behavioral modifications pertaining to diet and exercise of patients are significantly influenced by their attitudes and the manner in which family members engage in communication with them (Baig et al., 2015). The primary objective of this study was to evaluate the nutritional status, care, and support provided to outpatients diagnosed with type 2 diabetes mellitus.

RESEARCH METHODOLOGY

Research Design and Participants

A descriptive cross-sectional survey was conducted among outpatients diagnosed with type 2 diabetes mellitus in six hospitals. A random selection was made within the Kaduna metropolis, resulting in the inclusion of three public hospitals and three private hospitals.

The sample size was determined using Fisher's statistical formula, which is given by $N = Z^2pq/D^2$. In this

formula, N represents the minimum sample size, Z corresponds to the standard deviation set at 1.96 for a 95% confidence interval, P denotes the prevalence of DM (4.3%) obtained from a research study conducted in Northwest Nigeria (Sabir et al., 2018), q is equal to 1 minus P, and D represents the margin of unacceptable error or measure of precision (0.05). The sample size was determined to be 68 through calculations. The study involved a total of 280 participants. The study utilised a systematic random sampling technique to select a total of 280 subjects with type 2 diabetes mellitus who had given their consent.

The researchers utilised the Mini Nutritional Assessment (MNA) tool developed by Agarwalla et al. (2015) to gather demographic evaluation data related to the study's participants. The schedule incorporated the elements necessary for achieving the study's objectives. The questionnaire comprised the following data:

The present study examines four key aspects: (I) Socio-demographic factors, (II) Nutritional status including anthropometric measurements, dietary patterns, and lifestyle patterns, (III) Health-related complications, and (IV) Patient care and support specifically in the context of Diabetes Mellitus. The study draws upon the works of Wulandari et al. (2021) and Zimet et al. (1988) for guidance and adaptation.

The nutritional status was assessed by utilising the body mass index (BMI). The calculation involved dividing the weight (expressed in kilograms) by the square of the height (expressed in square meters). The classification of individuals into different weight categories follows the criteria established by the World Health Organisation (WHO) in 2000 and further supported by AL-Rethaiaa *et al.* in 2010. These criteria categorise adults based on their body mass index (BMI), with individuals falling into the underweight category if their BMI is less than 18.5, the normal weight category if their BMI ranges from 18.5 to 24.9, the overweight category if their BMI ranges from 25 to 30, and the obese category if their BMI exceeds 30 (WHO, 2012).

The collected data were subjected to descriptive analysis employing percentages and frequencies, while the hypothesis was examined through the utilisation of the chi-square statistic. The chosen level of significance was established at a value of P<0.05.

Ethical Consideration

The collection of data from outpatients of these hospitals was conducted with the appropriate authorization obtained from the State Ministry of Health. The study was carried out in adherence to ethical guidelines, which encompassed obtaining informed consent from participants, safeguarding data protection, and ensuring confidentiality. The participants were provided with information regarding the objective of the study and were given the opportunity to discontinue their involvement at any point without incurring any negative repercussions.

RESULTS

A total of 280 questionnaires were distributed to participants. All of the data was collected and subsequently examined for the purposes of this research. The sociodemographic distribution of the respondents, as depicted in Table 1, indicated that a majority of the participants (53.32%) identified as female, while 46.78% identified as male. Furthermore, 65% of the respondents fell within the age range of 30 years and above. Approximately 48.21% of the individuals surveyed reported being married, while 45.35% indicated having received primary and secondary education. Additionally, 36.07% of the respondents identified themselves as self-employed. The data reveals that a significant proportion of the participants (67.85%) identify as Muslims, whereas a smaller percentage (25.35%) identify as Christians. The analysis of the respondents' economic status, specifically their monthly income, indicates that 34.64% of individuals received less than 20,000 per month, 36.07% obtained an income ranging from 20,000 to 30,000 per month, and finally, 29.28% reported receiving an income exceeding 30,000 on a monthly basis.

The data regarding the participants' response on lifestyle patterns is displayed in Table 2. The data revealed that a majority of the respondents, specifically 35.35%, indicated that jogging was their preferred form of exercise. The data indicates that a majority of individuals, specifically 28.21%, expressed a preference for engaging in light exercise. Additionally, a significant proportion of respondents, approximately 21.78%, indicated a preference for walking as their preferred form of physical activity. Furthermore, a notable percentage of participants, specifically 14.64%, reported a preference for engaging in other forms of exercise. The findings indicate that a significant proportion of the participants refrain from engaging in the consumption of harmful drugs or substances, with only a minority of 4.28% reporting alcohol consumption. In terms of transportation preferences, the majority of respondents (60.71%) indicated their preference for utilising public transpor-tation for mobility, whereas a significantly smaller proportion (10%) expressed a preference for walking. In relation to the duration of sleep, a majority of the participants (74.28%) reported sleeping for more than 5 hours, whereas a minority (25.71%) indicated sleeping for less than 5 hours. The findings also indicate that a mere 39.64% of individuals possess a familial predisposition to diabetes.

The data pertaining to the dietary pattern of the respondents has been presented in Table 3, showcasing the participants' responses. The findings indicated that a total of 90 participants, accounting for 32.14% of the sample, reported consuming vegetables on a daily basis.

Table 1. Socio-demographic Distribution of the Participants

S/n	Variables	Frequency (n=280)	Percentage (%)
1.	Sex		
Male		131	46.78
Female		149	53.32
2.	Age (in years)		
<18		61	21.78
19-29		37	13.21
>30		182	65.0
3.	Occupation		
Student		79	28.21
Civil servant		29	10.35
Self-employed		101	36.07
Unemployed		71	25.35
4.	Education		
Primary/Secondary		127	45.35
Tertiary		109	38.92
None		44	15.71
5.	Marital status		
Single		121	43.21
Married		135	48.21
Divorced or widowed		24	8.57
6.	Monthly Income		
<20,000		97	34.64
20,000 – 30,000		101	36.07
>30,000		82	29.28
7.	Religions		
Christianity		71	25.35
Islam		190	67.85
Others		19	6.78

Table 2. Life Style pattern of Participants

S/n	Variable	Frequency (n=280)	Percentage (%)
1.	Exercise		
Light exercise		79	28.21
Jogging		99	35.35
Walking		61	21.78
Other		41	14.64
2.	Harmful drugs/substance intake		
None		209	74.64
Alcohol		12	4.28
Cigarette		20	7.14
Drugs		29	10.35
Others		10	3.57
3.	Mode of transportation		
Own vehicle		82	29.28
Public transport		170	60.71
Walking		28	10
4.	Sleeping duration		
<5hours		72	25.71
>5 hours		208	74.28
5.	Family History of diabetes		
Yes		111	39.64
No		169	60.35

Table 3. Food and Dietary Pattern of the Participants

S/n	Variables	Frequency (n=280)	Percentage (%)
1.	**Vegetables**		
Daily		90	32.14
Occasionally		169	60.35
Never		21	7.56
2.	**Fruits**		
Daily		71	25.35
Occasionally		195	69.64
Never		14	5
3.	**Meat products**		
Daily		59	21.07
Occasionally		180	64.28
Never		41	14.64
4.	**Milk/other dairy products**		
Daily		40	14.28
Occasionally		180	64.28
Never		60	21.42
5.	**Eggs**		
Daily		39	13.92
Occasionally		200	71.42
Never		41	14.64
6.	**Grain products**		
Daily		89	31.78
Occasionally		170	60.71
Never		21	7.5
7.	**Fast food consumption**		
Daily		21	7.52
Occasionally		61	18.27
Never		198	70.71
8.	**Junk food**		
Daily		14	5
Occasionally		39	13.93
Never		227	81.07
9. a. Brunch + Dinner		130	46.42
b. Breakfast + lunch + dinner		109	38.92
c. Breakfast +lunch + evening tea+ Dinner		41	14.64

Table 4. Nutritional Status of the Participants

S/n	BMI(Kg/M^2)	Category	Frequency (n=280)	Percentage (%)
1.	<16.0- 18.5	Underweight	39	13.92
2.	18.6 -24.9	Normal	142	50.71
3.	25.0-29.9	Overweight	55	19.64
4.	>30	Obese	44	15.71

Table 5. Health related Complications of the Participants

S/n	Complications	Frequency (n=280)	Percentage (%)
1.	Hypertension	101	36.07
2.	Cardiac Disease	45	16.07
3.	Arthritis	14	5
4.	Thyroid Disease	18	6.42
5.	Stomach Disturbance	20	7.14
6.	Body Pain	29	10.35
7.	Neuropathy	11	3.92
8.	Nephropathy	12	4.28
9.	Retinopathy	10	3.57
10.	Gastropathy	12	4.28
11.	Others	8	2.85

Table 6. Care and Supports received by Participants

S/n	Statement	Yes	(%)	No	(%)
1.	Family/ partner help me deal with illness	231	82.50	49	17.50
2.	I also get full attention and care when i get sick	199	71.07	81	28.92
3.	Family/partner help me anytime	221	78.92	59	21.07
4.	Family/partner is my strength	222	79.28	58	20.71
5.	Family/partner support to spiritual need	189	67.5	91	32.5
6.	Family/ partner give up on god's decision	180	64.28	100	35.71
7.	I get assistance for daily activities	220	78.57	60	21.42
8.	Family/ partner support for the maintenance of proper diet	219	78.21	61	21.78
9.	I received Financial support	201	71.78	79	28.21
10.	Family/ partner care and support on blood glucose monitoring, and medication.	222	79.28	58	20.71
11.	Family/ partner help to solve problems	199	71.07	81	28.92

Table 7. Association between Socio-demographic and nutritional status

S/n	Variables	Nutritional status				X^2	p-value
		Underweight	Normal	Overweight	Obese		
		n=39	n=142	n=55	n=44		
1.	**Sex**						
Male		19 (6.78)	76 (27.14)	20 (7.14)	16 (5.71)	6.9651	0.073017
Female		20 (7.14)	66 (23.60)	35 (12.50)	28 (10)		
2.	**Age (in years)**						
<18		29 (10.35)	26 (9.28)	3 (1.07)	3 (1.07)	86.5993	0.00001
19-29		6 (2.14)	18 (6.42)	10 (3.5)	3 (1.07)		
>30		4 (1.42)	98 (35)	42 (15)	38 (13.60)		
3.	**Occupation**						
Student		24 (8.60)	23 (8.21)	15 (5.36)	17 (6.07)	71.867	0.00001
Civil servant		4 (1.42)	13 (4.64)	8 (2.90)	4 (1.42)		
Self-employed		6 (2.14)	77 (27.50)	17 (6.07)	1 (0.36)		
Unemployed		5 (1.80)	29 (10.35)	15 (5.36)	22 (7.86)		
4.	**Education**						
Primary/Secondary		20 (7.14)	78 (27.86)	21 (7.50)	8 (2.85)	22.4993	0.000983
Tertiary		14 (5)	49 (17.50)	23 (8.21)	12 (8.21)		
None		5 (1.78)	15 (5.36)	11 (3.92)	13 (4.64)		

Table 7. Continue

5.	Marital status						
Single		20 (7.14)	69 (24.64)	22 (7.85)	10 (3.60)	25.3399	0.000295
Married		18 (6.43)	68 (24.30)	22 (7.85)	27 (9.64)		
Divorced/widowed		1 (0.36)	5 (1.80)	11 (3.92)	7 (2.50)		
6.	Monthly Income						
<20,000		15 (5.36)	67 (23.92)	5 (1.80)	10 (3.60)	41.4983	0.00001
20,000 – 30,000		15 (5.36)	43 (15.35)	19 (6.80)	24 (8.60)		
>30,000		9 (3.21)	32 (11.42)	31 (11.07)	10 (3.60)		
7.	Religion						
Christianity		10 (3.60)	42 (15)	16 (5.71)	3 (1.07)	17.5388	0.007494
Islam		23 (8.21)	90 (32.14)	38 (13.60)	39 (13.92)		
Others		6 (2.14)	10 (3.60)	1 (0.36)	2 (0.71)		

In contrast, 21 participants, representing 7.56% of the sample, stated that they never consumed potatoes. The majority of participants, specifically 169 individuals (60.35% of the sample), reported consuming potatoes occasionally. In relation to the consumption of fruits, it was found that 15 participants, constituting 5% of the total sample, reported never consuming fruits. Out of the total number of patients, 195 individuals, accounting for 69.64% of the sample, consume fruit on an occasional basis. Conversely, 71 patients, representing 25.35% of the sample, consume fruit on a daily basis. Out of the total participants, a significant proportion of 59 individuals (21.07%) reported consuming meat products on a daily basis, while a larger proportion of 180 individuals (64.28%) indicated occasional consumption of meat products. The study found that a significant proportion of participants, specifically 71.42%, reported consuming milk occasionally. Additionally, 13.92% of participants reported consuming milk on a daily basis, while 14.64% indicated that they never consume milk. When queried about their consumption of grain products, it was found that 21 individuals (7.5%) reported never consuming such products, while 89 individuals (31.78%) reported consuming them daily. Additionally, approximately 170 individuals (60.71%) reported consuming grain products occasionally. Out of the total patient population, a majority of 198 individuals (70.71%) reported abstaining from the consumption of fast food. A smaller proportion of 21 patients (7.52%) indicated a daily intake of fast food, while approximately 61 patients (18.27%) reported occasional consumption. In relation to the consumption of junk food, it was found that 130 patients, accounting for 46.42% of the sample, reported never consuming junk food. Additionally, 14 patients (5%) reported consuming junk food on a daily basis, while approximately 39 patients (13.93%) reported consuming it occasionally. Among the 280 participants included in the study, it was found that 130 individuals (46.42%) adhered to type (a) dietary pattern, 109 individuals (38.92%) adhered to type (b) dietary pattern, and 41 individuals (14.64%) adhered to type (c) dietary pattern.

Table 4 presents the data pertaining to the respondents' responses regarding their nutritional status. The study findings revealed that a significant proportion of the participants, specifically 142 individuals (50.71%), were classified as having a normal weight. A smaller percentage of the respondents, 39 individuals (13.92%), were categorised as underweight. Additionally, 55 participants (19.64%) were identified as overweight, while 44 individuals (15.71%) were classified as obese.

The participants' feedback regarding health-related complications is displayed in Table 5. The data revealed that out of the total respondents, 101 individuals, accounting for 36.07% of the sample, reported having Hypertension. Out of the total sample population, 45 individuals (16.07%) were found to have cardiac disease, while 29 individuals (10.35%) reported experiencing body pain. It is evident that among the respondents, 18 individuals (6.42%) reported having thyroid issues, while 20 individuals (7.14%) reported experiencing stomach disturbance. Similarly, the participants also reported experiencing various health conditions, including Arthritis (5% of respondents), Neuropathy (3.92% of respondents), Nephropathy (4.28% of respondents), Retinopathy (3.57% of respondents), Gastropathy (4.28% of respondents), and Other conditions (2.85% of respondents).

The participants' feedback regarding the care and support they received is displayed in Table 6. The findings indicated that a significant proportion of participants, specifically 199 individuals (71.07%), reported receiving comprehensive attention and care during periods of illness. A majority of the participants, specifically 231 individuals (82.50%), reported receiving assistance from their family or partner in managing their illness. A majority of individuals, specifically 221 out of the total sample, reported receiving assistance from their family or partner whenever needed, constituting approximately 78.92% of the participants. The study additionally unveiled that a majority of the participants 79.28% expressed that their family or partner serves as a source of strength for them. A total of 189 individuals

(67.5%) reported receiving support from their family or partner in meeting their spiritual needs. Conversely, 180 individuals (64.28%) indicated that their family or partner had abandoned their belief in divine intervention. According to the data presented in the table, it can be observed that a significant proportion of individuals, specifically 220 (78.57%), received assistance for their daily activities. Additionally, a similar percentage of 219 (78.21%) individuals reported receiving support for maintaining a proper diet. Furthermore, a considerable number of individuals, specifically 201 (71.78%), indicated that they received financial support. A significant majority of the respondents, specifically 222 individuals (79.28%), reported receiving care and support pertaining to blood glucose monitoring and medication. Finally, a total of 199 individuals, accounting for 71.07% of the sample, received assistance from their family or partner in resolving their problems.

Table 7 displays the correlation between socio-demographic status and nutritional status. The findings of the study revealed a lack of statistically significant association between nutritional status and certain socio-demographic factors (Sex, p= 0.073017). Significant relationships were observed among all the other variables, namely Occupation (p=0.0001), Religion (p=0.007494), Age (p=0.00001), Education (p=0.000983), Marital status (p=0.000295), and Monthly Income (p=0.000295).

DISCUSSION

The current study included a sample of 280 individuals diagnosed with type 2 diabetes. The analysis of the socio-demographic distribution indicated that a near half of the participants (53.32%) identified as female, while 46.78% identified as male. The potential rise in diabetes prevalence among females may be attributed to several factors, including a higher likelihood of leading a sedentary lifestyle, increased obesity rates, and reduced engagement in strenuous physical activities compared to males. Previous research has also documented similar findings in other studies (Wahome and Kibi, 2016; Ansari et al., 2019).

The socio-demographic profile of the study population indicates that the majority of individuals included in the study were adults aged over 30 years. This finding aligns with the research conducted by Ansari et al. (2019), Mwann et al. (2018), and Wahome and Kibi (2016). According to the World Health Organisation (WHO, 2003), a significant proportion of individuals diagnosed with diabetes mellitus are aged 41 years and older. The observed phenomenon can be attributed to the presence of glucose intolerance that is commonly associated with advancing age. As individuals age, there is a decrease in cellular sensitivity to insulin. The lack of sensitivity observed may be attributed to the decline in physical activity commonly observed in individuals as they age. Furthermore, nearly half of the individuals possessed the status of being married, had completed both primary and secondary education, and were engaged in self-employment. The reported prevalence of this finding pertaining to marital status is comparatively lower when compared to the findings reported in Sudan, which stood at 60% (Mohamed et al., 2017). According to Kassahu (2016), Ethiopia has a prevalence rate of 81.2%. Additionally, Adepoju et al. (2018) found a similar prevalence rate in Ibadan, Nigeria, while Okafor and Adepoju (2019) reported a prevalence rate in Ogun state, Nigeria.

The results pertaining to the respondents' lifestyle patterns indicate that physical exercise is a common practise among them, with jogging being the most frequently reported form of exercise. According to a study conducted by Firouzi et al. (2015), a significant majority of 59% of the participants reported infrequent or nonexistent engagement in physical exercise. The majority of the participants abstain from the consumption of harmful drugs or substances, while only a minority partake in the consumption of alcohol. The majority of participants utilised public transportation as their primary mode of transportation and reported sleeping for a duration exceeding five hours per day.

The study participants demonstrated a consistent consumption of vegetables and fruits on a daily basis in their food and dietary patterns. The inclusion of fruits and vegetables in one's diet is crucial for maintaining good health. Consuming an adequate amount of these food groups on a daily basis has been shown to have potential benefits in the prevention and management of various diseases, including cardiovascular diseases, diabetes mellitus, and certain types of cancers (World Health Organization/Food and Agriculture Organisation, 2004; Oladapo, 2013; Mohammed et al., 2017). Vegetables possess dietary fibre, a component that aids in the reduction of cholesterol levels.

In relation to the nutritional status of the participants, the study reveals a prevalence rate of 35.53% for overweight and obesity. The study's findings indicate that the prevalence of obesity is marginally lower compared to the reported rates in Kenya (50.9%) (Wahome and Kibi, 2016), Ethiopia (9.4%) (Kassahun, 2016), and India (15%) (Singh et al., 2015). However, it is higher than the prevalence observed in Nigeria (11.67%) (Oladapo et al., 2013) and 48.89% (Tunrayo, 2013). The potential explanation for the occurrence of diabetes may lie in the association between overweight and obesity and the development of diabetes. Obesity is recognised as a significant predisposing factor for the development of type 2 diabetes. It could potentially arise as a consequence of inadequate dietary practises. It is worth noting that a significant proportion of the global adult population, specifically one in three individuals, is classified as overweight, while one in ten individuals is

categorised as obese (Wahome and Kibi, 2016). The condition of being overweight or obese is linked to an elevated level of cellular resistance to the activity of insulin. This outcome may be attributed to the fact that merely one-third of the participants engage in jogging as a means of physical activity.

There were indications of health-related complications. The most prevalent complications observed among the participants were hypertension, cardiac disease, and body pain. The aforementioned finding was substantiated by data published in 2005 by the Centres for Disease Control and Prevention (CDC), which reported a significant prevalence of complications, namely Micro- and Macrovascular, among individuals diagnosed with diabetes. The findings of Al-Maskari *et al.* (2013) are consistent with the present study, as they also concluded that 64.4% of the participants in their study exhibited chronic conditions.

The participants in this study received significant levels of parental or partner care and support, indicating that they were provided with comprehensive attention, care, and assistance during times of illness. Despite the absence of certain clinical manifestations, it is imperative to acknowledge that individuals with diabetes mellitus inevitably encounter a chronic state that significantly influences both their physical and psychological well-being. Hence, the provision of assistance, particularly from the family, can facilitate the patients' acceptance and prompt adjustment to their illness (Mayberry et al., 2016; Yue et al., 2019). The findings of the study also indicated that a majority of the participants expressed that their family or partner served as a source of strength, providing support for their spiritual needs and accepting God's decisions. Prior research has demonstrated a correlation between spirituality and an individual's level of acceptance regarding their illness (Salomé *et al.,* 2014; Polisetty and Sheela, 2017). When an individual falls ill, it is customary for them to seek medical attention from a healthcare professional or pursue alternative forms of treatment. The act of actively pursuing this treatment can be seen as a manifestation of acknowledging and embracing the presence of the ailment being encountered. An individual's acceptance of pain is contingent upon their genuine acknowledgment and surrender to the divine decree of God, specifically in relation to the affliction they endure. The phenomenon being described can be characterised as the act of complete surrender exhibited by a living organism towards its creator (Meier *et al.,* 2005; Yusuf *et al.*, 2016).

The findings revealed that a majority of the participants received aid for their daily activities, assistance in maintaining a healthy diet, and financial support. The findings additionally indicate a greater proportion of participants receiving sufficient care in terms of blood glucose monitoring and medication. The majority of individuals received assistance from their family or partner in resolving their problems. Prior research has indicated that patients often encounter challenges when undergoing treatment, necessitating support from multiple sources, including their family (Baek *et al.,* 2014; Simon-Tuval *et al.,* 2016).

Furthermore, a noteworthy correlation was identified between nutritional status and various demographic factors, including occupation, religion, age, education, marital status, and monthly income. There was no statistically significant correlation observed between the nutritional status of the participants and their gender. This finding is consistent with the research conducted by Adepoju *et al.* (2018) and Olayiwola *et al.* (2006).

CONCLUSIONS

The prevalence of overweight and obesity in Nigeria is experiencing a significant escalation, mirroring the global trend. From the standpoint of Kaduna, the prevalence of overweight and obesity has emerged as a significant social concern. The study found that among individuals with type 2 diabetes, the prevalence of overweight and obesity, as determined by BMI, was 19.64% and 15.71% respectively. The findings indicated that individuals with diabetes commonly experience complications such as hypertension, cardiac disease, and body pain. The study revealed a substantial prevalence of familial and partner involvement in the care and support of individuals diagnosed with diabetes mellitus. The study revealed a significant correlation between nutritional status and various demographic factors, including occupation, religion, age, education, marital status, and monthly income.

RECOMMENDATIONS

From the results of this study, we recommend that:
a. Patients with diabetes should undergo regular screening and receive education regarding potential complications associated with the disease.
b. Additional nutritional assessment tools are necessary in order to accurately determine the genuine nutritional status of patients, in addition to relying solely on BMI.
c. Incorporation of customised dietary plan preparation and patient consultation is necessary for the regular follow-up of patients with type 2 diabetes.
d. Additional research should be warranted to further investigate the efficacy and obstacles associated with familial assistance provided to individuals diagnosed with type 2 diabetes.

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