CORRELATION BETWEEN FOOD LITERACY AND DIET COMPLIANCE AMONG DIABETIC PATIENTS IN RIVER STATE, NIGERIA

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Abstract

Diabetes is a health challenge that has accounted for many deaths and morbidities worldwide. The growing burden of diabetes and the inability to find a complete cure necessitate proper self-management. Evidence has shown that proper dietary guidelines slow the progression of the disease. However, little is known about the relationship between food literacy and dietary compliance in patients with diabetes. Two hundred and eight diabetic patients attending the public health centers in River State, Nigeria, participated in the study. They included 116 (55.8%) males and 92 (44.2%) females. The respondents completed a self-reported measure of food literacy with an oral interview. The analysis showed that food literacy statistically significantly predicted the respondent's dietary compliance at $F_{(1,206)}$, 138.97, P .000). Notably, the result indicated that food literacy contributed about 45.1% of the variation in dietary compliance among the respondents. Thus, food literacy was recommended to be an essential determinant of dietary compliance. The implication of the study is discussed.

Keywords: *Food literacy, dietary compliance, diabetes, diabetic patients*

BACKGROUND

Diabetes is a long-term condition that develops when either the pancreas does not create enough in sulin or the body cannot properly utilize the insulin produced. The hormone insulin controls sugar levels in the blood. Hyperglycemia, sometimes called elevated blood glucose or blood sugar, is a common complication of uncontrolled diabetes. Left untreated can cause irreversible damage to numerous bodily systems, most notably the nervous and blood vessels. Diabetes has been identified as the most challenging global public health threat of the twenty-first century (Afsar & Elsurer, 2017; Cai et al., 2020; Hope et al., 2021; Hwalla et al., 2021; Lamb et al., 2021; Sciberras et al., 2020; Sun-Wang et al., 2021; Xiong et al., 2020; Yamagishi & Matsui, 2016; Yang et al., 2022). The global prevalence and impact of diabetes have increased dramatically in recent years (Pastakia et al., 2017). The most common is type 2 diabetes. The growing burden of diabetes is fueled by obesity-inducing lifestyle behaviors, including high-calorie diets (Ashrafzadeh & Hamdy, 2019).

In Nigeria, the prevalence of diabetes mellitus has steadily increased. According to studies, the prevalence of diabetes mellitus ranges from 0.8 to 4.4 percent. (Sabir et al., 2013). Every part of the nation has been impacted, with the south-south geopolitical zone showing the highest prevalence (Uloko et al., 2018). The prevalence of diabetes mellitus among Nigerians has been studied extensively, and a recent systematic review and meta-analysis of those studies found that the overall pooled prevalence was 5.77 percent (Uloko et al., 2018). Impaired glucose tolerance was anticipated to affect 8.2 million Nigerians as of 2019, which is expected to rise. This is very concerning because decreased glucose tolerance significantly contributes to the emergence of type 2 diabetes and cardiovascular disease in the future. Therefore, diabetes mellitus is expected to worsen and become a more significant source of morbidity and mortality in Nigeria, where it already is (Fasanmade & Dagogo-Jack, 2015). Worrisome is the rise in the prevalence of diabetes mellitus in sub-Saharan Africa in general and Nigeria in particular.

Diabetes is now a significant public health issue in Nigeria. Diabetes is already significantly negatively impacting people's lives, families, communities, and health resources in Nigeria, endangering already precarious health systems. As a result, quick action is required to address the prevention, diagnosis, and management of diabetes mellitus in the most economical way possible (Atun & Gale, 2015; Jaffar & Gill, 2017). The consequences that result from persistent hyperglycemia are a significant concern in diabetes. Disability and mortality are caused by complications, which include cardiovascular illnesses, neuropathies, nephropathies, and retinopathies (Zimmet, 2017). The increasing prevalence of diabetes and a growing global shortage of healthcare professionals necessitates developing better approaches to diabetes care (Phillip et al., 2021). Therefore, achieving ideal glycemic control is essential for stopping or delaying these consequences, and self-management strategies must support better glycemic control.

Self-management can be defined as the act of consciously engaging in self-care practices to improve one's behavior as well as one's overall wellness (Powers et al., 2015). Self-management of diabetes includes several practices, including regular exercise, adherence to a prescribed diet, taking prescribed medications as indicated, and monitoring blood glucose levels. Dietary self-management, more so than other aspects of managing diabetes on one's own, promotes healthy eating habits and assists individuals in reaching their ideal weight, blood glucose, cholesterol, and blood pressure levels (Al shayban, 2017; Franz et al., 2014). Healthy nutrition is essential to diabetic self-management techniques (Adeleke & Ayenigbara, 2019; Li et al., 2021). Indeed, several disparate studies have highlighted various evidence-based nutrition recommendations for people with diabetes (Azeez et al., 2020; Dyson et al., 2011; Franz & Macleod, 2018; Mechanick et al., 2012; Sanz-Paris et al., 2017; Udogadi et al., 2019). These recommendations encourage good eating and advice diabetics to choose healthy foods, organize their meals, and control their calorie demands.

Notably, diet adherence has been shown to slow down the progress of diabetes (Fardet, 2014; Shaheen et al., 2021). To effectively manage the trend of diabetes, patients are advised to maintain dietary recommendations and create a meal plan that includes food diversity, portion size, and serving time. Importantly, diabetic patients must assess their daily calorie consumption relative to their body weight. However, intimation suggests that most people living with diabetes have difficulty of adherence to dietary recommendations. In Nigeria, though, the evidence is scanty. The available few studies show increasing dietary non-compliance in patients with diabetes (Abioye-Kuteyi et al., 2005; Adisa & Fakeye, 2014). However, data on determinants of dietary compliance in patients with type 2 diabetes in River State, Nigeria, is lacking. This study aimed to fill the evidence gap on the antecedents of dietary compliance of persons with Type 2 diabetes in River State, Nigeria

One factor that may contribute to the dietary management of diabetes is an individual's level of food literacy, among various individual and environmental factors that influence dietary habits positively or negatively. Indications suggest that food literacy is an influential factor in dietary adherence in patients with diabetes. Food literacy reflects a collection of interrelated knowledge, skills, and behaviors required to plan, manage, select, prepare, and eat healthfully (Vidgen & Gallegos, 2014). It describes the idea of proficiency in food-related skills and knowledge (Truman et al., 2017). People in the general population with lower levels of food literacy have a harder time interpreting food labels, choosing the appropriate goods, maintaining a healthy balance between their food intake and needs, and preparing nutritious meals (Poelman et al., 2018). This corresponds with the four domains of food literacy: planning and management, selection, preparation, and eating. Food literacy is derived from the broader concept of health literacy associated with health promotion. The association with dietary compliance has not been explored much for food literacy in patients with diabetes.

The primary purpose of the present study is to investigate food literacy as a scarcely explored variable that could determine diet compliance among patients with diabetes in River State, Nigeria.

Hypothesis: *Food literacy would significantly predict diet compliance among patients with diabetes in River State, Nigeria.*

Method
The study was a cross-sectional survey. The participants of this study were adults with diabetes attending the diabetic follow-up in public healthcare centers under the River State primary healthcare management board. The inclusion criteria included being 30 years and above and visiting the clinics during the study period. Patients who were pregnant, breastfeeding and having documented cognitive impairment were excluded. Participants were recruited through convenience sampling to include only diabetic patients based on the study's objective. The patients were approached in the outpatient departments of the centers between December 2022 and February 2023 and were asked to participate in the survey to understand their food-related knowledge better. Thus, those who consented to participate completed a consent form and were handed the study questionnaire to fill out on the spot. In all, 208 questionnaires were appropriately filled and returned.

Questionnaire
Food literacy was measured using a modified version of the Food Skills Questionnaire developed by the Ottawa Public Health, designed to assess food knowledge, planning, and techniques. Indeed, some questions were simplified to suit the current context. The questionnaire was subjected to a pilot study to ascertain its reliability and validity. Consequently, a Cronbach alpha of 0.86 was obtained. A higher score indicates a high food literacy. Also, the Food Choice Questionnaire was used to measure the respondent's food choices. The Linkert-type scale contains items that seek to ascertain the importance of several factors that influence food choice: "health," "sensory appeal," "price," "convenience," "mood," "natural content," "weight control," "familiarity" and "ethical concern." The scale recorded a 0.78 reliability coefficient in the study.

Result
A cross-sectional design was employed in the study. Data from the respondents were analyzed using the statistical package for social sciences (SPSS, Version 23). According to the demographic statistics, 178 (85.6%) responders were between 30-60 years old, and 30 (14.4%) were 60 and above. There were 116 (55.8%) males and 92 (44.2%) females among the responders. Regarding receiving dietary information, 95.2% (198) participants reported having received it at least once, while 4.8% (10) indicated that they never received any guidelines. About 36.5% (76) obtained it from their doctors during their appointment, and 31.7% (66) said they received dietary guidelines from nurses. 13.5% (28) reported that nutritionists provided them with the guidelines, while 18.3% (38) got the information from other sources apart from experts (Table 1).

Table.1. Demographic results.

	Frequency	Percentage (%)
Age		
30-59	178	85.6
60 above	30	14.4
Gender		
Male	116	55.8
Female	92	44.2
Received dietary guideline.		
Yes	198	95.2
No	10	4.8
Dietary guideline provider		
Doctor	76	36.5
Nurse	66	31.7
Nutritionist	28	13.5
Others	38	18.3

Table 2: showing the regression result for the relationship between food skills and healthy food choice

	B	SEB	β	R^2	t	Sig
Constant	2.59	.078			32.99	000
Food literacy	.64	.054	.69	.451	11.84	000

*Note. B = Unstandardized regression coefficient; SEB = Standardized error of the Coefficient; β = Standardized Coefficient; R^2 = Coefficient of determination. *P<.000.*

A simple regression model was employed to test whether food literacy predicted the respondent's dietary compliance. The analysis showed that food literacy statistically significantly predicted the respondent's dietary compliance F (1,206),

138.97, P<.000. Thus, the expectation that food literacy will significantly predict dietary compliance in patients with diabetes in River State was affirmed.

Discussion

This study aimed to investigate food literacy as a determinant variable in dietary compliance among patients with diabetes in River State, Nigeria. The findings suggest that food literacy contributes significantly to dietary compliance among patients with diabetes. Higher food literacy was associated with the likelihood of adhering to recommended dietary procedures, while poor food literacy is linked to the propensity for non-dietary compliance. This study is one of the few to explore the link between food literacy and the variation in dietary compliance among people with diabetes in the present context. For this reason, it is not easy to compare these findings with similar studies in Nigeria. However, there is no consensus on how to define "low" or "high" food literacy (Lavelle et al., 2016, 2017). Nevertheless, research suggests that food-related skills must be contextual and vary according to sociodemographic variables (Perry et al., 2017; Vidgen & Gallegos, 2014).

An essential finding of this study is that food literacy contributed 45.41% of the variation in dietary compliance among patients with diabetes in River State, Nigeria. Thus, the result corroborates previous studies that found that increased cooking skills motivate people to prepare food with available resources. Hence, it denotes an asset when budgets are inadequate (Daly & Kelly, 2015; Hammelman, 2018; Power et al., 2018). Food literacy is considered a form of embodied cultural characteristics involving the deployment of psychomotor potentials. From the present finding, food skills appear to be an artistic feature that can increase the self-management of diabetes. However, it is crucial to be cautious in concluding that food literacy alone can determine dietary compliance. Previous studies indicate the role of situational factors in food choice. For instance, situations relating to inadequate cooking resources could decrease the relevance of food skills (Begley et al., 2019; Buck-McFadyen, 2015; McLaughlin et al., 2003). Also, a lack of kitchen infrastructure can contribute to the diminished effect of food skills.

Practical Implications

The study individual food literacy levels in diabetic patients and showed that higher food literacy levels are associated with better adherence to the dietary guideline. Enhancing food literacy levels may be a potential target in future dietary intervention studies aiming to improve dietary intake and health outcomes of people with diabetes.

Conclusion

The study's primary purpose was to investigate food literacy as a motivating factor that could predict healthy food choices in individuals with diabetes. The result indicates a positive interaction between food literacy and healthy food compliance. However, the study is faced with certain limitations. For instance, the convenience sampling method used to employ the respondents restricts the generalization of the findings to all diabetic patients in Nigeria and introduces selection bias. Also, food literacy was self-reported. Thus, they may reflect individual perceptions and may not be an objective measure. However, the study provides valuable information on food literacy and dietary compliance among patients with diabetes in River State, Nigeria. The findings from this study can be relevant for managing diabetes and other related health outcomes. Also, the study provides information that reflects the need to boost food literacy among diabetic patients with limited knowledge of meal preparation. This can be done by making home economics a compulsory subject in the educational curriculum of Nigeria.

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