

AN ANALYTICAL STUDY ON THE RELATIONSHIP BETWEEN NUTRITIONAL LITERACY AND ADHERENCE TO DIETARY PROTOCOLS AMONG INDIVIDUALS WITH DIABETES IN ENUGU STATE, NIGERIA

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Abstract

This paper explores the repercussion between nutritional literacy and adherence to dietary measures set among people with diabetes in Enugu State in Nigeria. The level of nutritional literacy, which includes the capacity to access, understand, and use any information related to nutrition, is essential to manage diabetes properly. The topic of the research fills the knowledge gap regarding the role of nutritional literacy as a variable affecting dietary adherence in a resource-limited environment with distinct socio-cultural interplay. The sample surveyed consisted of 400 individuals with diabetes diagnosis, chosen by means of the purposive sampling of healthcare facilities in Enugu State. Validated questionnaires that were used to determine nutritional literacy and dietary adherence were used to collect the data and supplemented with discussions in focus groups. The results indicate a strong positive relationship exists between nutritional literacy and compliance to dietary guidelines, and the socio-demographic variables: education, income, and access to healthcare services are mediating ones. The research indicates that a specific nutrition education intervention is important to close the literacy gap and achieve better outcomes of diabetes in Nigeria. The measures that come into recommendation involve incorporation of nutritional literacy into primary care, and the ability to use the community platform to promote dietary compliance.

Keywords: Nutritional literacy, dietary adherence, diabetes management, Enugu State, Nigeria, nutrition education.

Introduction

Diabetes mellitus is a chronic metabolic condition linked to increased blood glucose levels and is a major health concern to the general populace in the world, with the sub-Saharan Africa reporting an increasing burden. The rates of diabetes prevalence are estimated to be 4.3%-6 in Nigeria, and the same situation exists in Enugu State where diabetes has been affected by urbanization, lifestyle, and genetic factors. Management of diabetes depends on the ability to follow dietary guidelines, which will comprise the personalised nutritional habits in order to control the amount of glucose in the blood, eliminate health complications, and improve quality of life. Noncompliance remains, however, suboptimal, especially in low-resource environments where the obstacles include low access to healthcare, socio-economic, and insufficient knowledge. Nutritional literacy- the ability to acquire,

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process and use information concerning nutrition is becoming identified as the determinant of health outcome in the management of chronic diseases. In comparison with general health literacy, nutritional literacy is specifically concerned with the knowledge and skills of food-related issues, as they are essential to people with diabetes needing to cope with intricate guidelines on what to eat. In Enugu State, where cultural dietary lifestyles and economic issues determine food preferences, interaction between nutritional literacy and dietary compliance is a topic worth investigating.

Connection between health literacy and medication adherence has been clarified before, however, the particular connection of nutritional literacy and adherence to dietary protocols in Nigerian setting is underresearched. In a bid to fill this gap, the proposed research will seek to determine the effect of nutritional literacy in adherence of dietary guidelines among diabetic patients in Enugu State. The study concentrates on the Nigerian population by capitalizing on the socio-cultural and economic peculiarities that distinguish this environment, as opposed to the west, where most of the literature we have been studying is rooted. The objectives of the study are to determine the level of nutritional literacy, determine the level of diet adherence, and determine the socio-demographic factors that mediate the relationship. It is anticipated that the findings will be used to inform policy and practice to especially consider in creating interventions to enhance diabetes management in resource-limited locations.

Literature Review

The increase in the number of cases of diabetes has attracted a lot of studies concerning needs to promote effective management across the world. Diabetes management overall, and dietary adherence in particular, entails adherence to the prescribed nutritional recommendations, including ensuring the adequate regulation of the carbohydrate intake, preference of low-glycemic foods, and the control of the portions. Research has continued to reveal that compliance with dietary regimen improves glycemic regulation, complicates and lowers quality of life. Non-compliance however is a widespread problem, and the rates are as high as 50 percent of the population. Socio-economic and cultural eating habits, as well as medical infrastructure, form another complication to adherence in sub-Saharan Africa. Nutritional literacy is described as a factor of critical concern in health behavior studies. According to Carbone and Zoellner (2012), nutritional literacy is a sub-set of health literacy that involves the capacity to be informed about the food quality and make informed choices as well as being able to apply a diet to maintain food recommendations.

The increase in nutritional literacy is correlated with the improved self-management in the case of chronic illnesses, such as diabetes. As an example, one of the studies performed by Berkman et al. (2011) identified that most people with high levels of health literacy followed through dietary and medication prescriptions better. Nevertheless, nutrition literacy is beyond just the general literacy, as it encompasses a particular knowledge of food content, food portions, and diet relevance to disease pathogenesis. In Nigeria, nutritional literacy research is scarce and the majority of the studies are general health literacy studies or investigates the maternal nutrition. Report by Afolabi et al. (2016) in Lagos State revealed poor dieting among diabetic patients, which was caused by poor education and their cultural beliefs on food. Likewise, Enugu reports by Eze et al. (2018) indicated that patients were inclined to choose their preferred high-carbohydrate diets instead of following the prescribed low-glycemic diets, as the causes of the nutritional knowledge gap.

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These results indicate that nutritional literacy can be one of the determinants of dietary adherence, but little research has investigated this relationship quantitatively in the Nigerian population. Education, income, and access to healthcare are socio-demographic factors that are known to affect nutritional literacy and nutritional adherence. The higher level of education is linked with better understanding of health information and availability of healthy food is influenced by income. These factors apply especially in the Enugu State where gender inequalities exist between rural and urban areas. Culture is also a factor since the traditional diets which are high in starchy foods such as yam and cassava may not be in tandem with the suggested diabetes diets. The literature highlights the role of context-based studies in the treatment of these dynamics, especially in sub-Saharan Africa, where there are special issues of managing diabetes. The theoretical basis of the present research is based on the Health Belief Model which assumes that perceived susceptibility, severity, benefits, and the perceived barriers are some of the factors that determine health behaviors. Literacy in nutrition increases perceived benefits and decreases interference with dietary compliance through preparation of people by providing the knowledge and skills to make sound decisions. The study will use this framework to explore the relationship between literacy and adherence, as well as the way the relationship is mediated by socio-demographic factors.

Methodology

The research was cross-sectional as it aimed at establishing the connection between nutritional literacy and dietary adherence in patients with diabetes in Enugu State, Nigeria. The focus population was adults of 18 years and above with type 1 or type 2 diabetes who were visiting the healthcare facilities in Enugu State. It was calculated that 400 respondents would be used, taking into consideration a 5% error margin and 95% confidence interval, since the prevalence of diabetes was calculated as 5%. To be representative, purposive sampling led to participants being selected in three tertiary hospitals and five primary healthcare centers in rural and urban regions of the Enugu State. The main two data collection procedures consisted of a structured questionnaire and the focus group discussions. The validated tool-modified questionnaire comprised of three sections. The initial section involved socio-demographic data comprising of age, gender, education, income, and period of diabetes diagnosis.

The second part evaluated nutritional literacy based on a revision of the Nutritional Literacy Scale created by Diamond (2007) to assess the skills of comprehending and utilizing nutrition-related knowledge. The third examined the dietary adherence based on the Dietary Adherence Questionnaire that measures the adherence to dietary guidelines as per the advised dietary guidelines, including carbohydrate regulation and portion control. A pilot study which involved 30 diabetic patients was used to test the validity of the questionnaire against reliability and cultural suitability where the Cronbachs alpha of nutritional literacy was 0.82 and dietary adherence was 0.79. A concentration of 40 participants (20 in each of four groups) was used in the focus group discussions to provide qualitative data on the limitations and enabling factors to dietary adherence. The sessions took an average time of 60 minutes and were facilitated by a trained facilitator through a semi-structured guide. The audio-recorded discussions were transcribed word-to-word and then analyzed thematically to supplement the quantitative results.

The Enugu state ministry of health ethics committee gave the required ethical review and informed consent was applied to all the participants. The collection of data was done between March and June

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2025. The SPSS version 25 was used to analyze quantitative data. The socio-demographic characteristics, the levels of nutritional literacy and adherence were summarized using descriptive statistics, frequencies, and percentages. The correlation coefficient was used to explore the relationship between nutritional literacy and dietary adherence due to Pearson, and multiple regression analysis to determine the impact of socio-demographic factors. The thematic analysis of qualitative data based on the focus group discussions was done as the codes and themes were formulated over time to mirror the views of participants. The quantitative and qualitative results report combined gave a full picture of the research purposes.

Results

The research involved 400 respondents with the response rate of 95. The demographic colour was indicated to be equal with women making 52 percent and men 48 percent of the sample. The average age was 54.3 (SD =11.2) with 18-78. The level of education was also varied where 28% of them have primary or less education, 45% have secondary education and 27% have tertiary education. Their income levels were mostly low to middle-income as 60 percent of people had income less than N50, 000 monthly.

Most of them (78%) were diabetics with type 2, and the average length of the diagnosis was 7.8 years (SD = 4.5). There was a 55 and 45 percent rural and urban population respectively in the sample respectively. The scores on nutritional literacy were 10 to 50 with a mean of 32.4 (SD = 8.7) that shows the level of literacy as middle. The percentage of those that displayed high nutritional literacy (score 40 or higher) was only 22 percent and low literacy (score 25 or less) was 38. The dietary adherence scores fell and were between 8 and 40 and the mean score is 28.6 (SD = 7.9). About one-third of respondents (30) were found to be highly adherent (scores 35 and above), and one-third (35) were also found to be low adherent (scores 20 and below).

The correlation analysis of Pearson established that there is a strong positive correlation between literacy levels on nutrition and food compliance ($r = 0.62$, $p = 0.001$), indicating that the more literate is the individual, the more food compliance is expected. In the multiple regression, education, income, and access to healthcare were found to be the most important predictors of dietary adherence with 48% variance, $R^2 = 0.48$, $p < 0.001$. Tertiary education participants had a 2.3-fold likelihood of following dietary guidelines than primary and below education participants (0.31 , $p < 0.01$).

Increased income and frequent access to healthcare services were also positively correlated with adherence (0.25 , $p < 0.05$; 0.20 , $p < 0.05$, respectively). There were no significant effects on age, gender, as well as the duration of diagnosis. Focus group discussions indicated some important themes through qualitative results. The participants with poor nutritional literacy misinterpreted what they were told to eat and explained that they got confused or lost with other terminologies such as low-glycemic foods and could not understand the labels on foods. Inhibitors to adherence were often cited as cultural preferences to high-carbohydrate items e.g. pounded yam. On the other hand, respondents who were more literate said that they employed techniques such as planning meals and seeking the advice of a dietician that helped them follow up. Availability of cheap healthy food items was a common issue, especially to the participants in the rural areas.

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Table 1
Socio-Demographic Characteristics of Participants (N = 400)

Variable	Frequency (%)
Gender	
Male	192 (48%)
Female	208 (52%)
Age Group	
18–35 years	60 (15%)
36–55 years	180 (45%)
56+ years	160 (40%)
Education Level	
Primary or less	112 (28%)
Secondary	180 (45%)
Tertiary	108 (27%)
Monthly Income	
< N50,000	240 (60%)
N50,000–N100,000	120 (30%)
> N100,000	40 (10%)
Residence	
Urban	220 (55%)
Rural	180 (45%)

Table 2
Correlation Between Nutritional Literacy and Dietary Adherence

Variable	Nutritional Literacy	Dietary Adherence
Nutritional Literacy	1.00	0.62**
Dietary Adherence	0.62**	1.00

Note: **p < 0.001

Discussion

The results prove that there is a strong positive correlation among nutritional literacy and compliance to dietary regimens among diabetes individuals in Enugu State in line with earlier studies. The study of moderate levels of nutritional literacy indicates that although most of the participants are able to have basic knowledge of nutrition, there are still a number of gaps that exist in the complex dietary guidelines. This is in line with Afolabi et al. (2016), who reported low nutritional awareness among diabetic patients in Nigeria. The positive ($r = 0.62$) correlation highlights why literacy is relevant in helping an individual to interpret and implement dietary instructions to justify how the Health Belief Model argues that knowledge acts as an mediating factor in health-related behaviors. The socio-

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demographic variables especially education and income turned out to be the mediators. Individuals who had received higher education levels were more suited to understand nutritional information, which may have been owing to the increased exposure to health education. People also found income to affect adherence based on relative access to various and nutritious food items, which was also endorsed by Eze et al. (2018) in Enugu.

Added on top of the challenges rural participants had to deal with were the inability to receive healthcare and use traditional diets, which necessitated context-specific intervention. These findings were complemented by the qualitative data which showed the cultural and economic inhibition that could not be identified using quantitative methods. The gap in the literature is important because the study deals with nutritional literacy, not with general health literacy, and it provides an insight into diabetes management in Nigerian setting, which is more specific. In contrast to Western research, which largely presupposes a higher access to healthcare, this study is based on the realities of resource-limited conditions, in which the socio-cultural and economic circumstances shape health behaviors.

The combined use of quantitative and qualitative approaches enhances the strength of the study giving the comprehensive picture of the problem. However, limitations exist. The cross-sectional study design does not allow causal inferences and the use of self-report results implies bias. Although the purposive sampling approach is practical, it can be weak as far as analysis of other states other than Enugu. Longitudinal designs can be used by the future research to test causality and other parts of Nigeria to increase representativeness. Furthermore, the measures to enhance the nutritional literacy, including mobile health apps or community education, demand further research.

Conclusion and Recommendations.

This paper shows that nutritional literacy is a major factor that predetermines the adherence to the diet among diabetes patients in Enugu State, Nigeria. The results indicate a necessity to eliminate the literacy gap with specific interventions, especially in individuals with less level of education and income. Development and application of culturally-competent educational materials, integration of nutritional literacy programs into primary healthcare, and mobilization of the community health workers would help to increase adherence and improve diabetes outcomes. There should be affordable access to nutritious foods and the strengthening of healthcare infrastructure in rural regions to become the priority of the policymakers. Research in the future ought to consider scalable interventions that can increase nutritional literacy and determine their long-term effectiveness in benefiting glycemic control and quality of life. Healthcare professionals, teachers, and members of the government should work together to develop sustainable measures to manage diabetes in Nigeria. This study fills the gap that covers the interplay between literacy, socio-economic, and cultural dynamics between developing chronic disease management in resource-constrained contexts.

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