Journal of the Society for Human Ecologists in Nigeria (JSHE)
An Annual Publication of the Society for Human Ecologists in Nigeria (SHEN)
Vol. 7 No. 1, 2026 | pp. 65–73 | ISSN: 3026-9083 (Print)

DOI: https://doi.org/10.68064/jshe.2026.iaupopsa

Compliance to Personalized Meal Plan among Out-Patients with Chronic Diseases at Kwara State University Teaching Hospital, Nigeria

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Abstract
Nutrition plays a vital role in the management of chronic diseases such as hypertension and diabetes, which are increasingly prevalent in local communities. Personalized nutrition through meal plans tailored to an individual's dietary needs, lifestyle, and overall wellbeing has become an essential strategy for improving health outcomes. This study investigated compliance with personalized meal plans among out-patients in Kwara State University Teaching Hospital, Nigeria. The study was guided by four (4) research questions and one hypothesis and adopted a descriptive survey design. From a population size of five hundred and forty-five (545), one hundred and twenty (120) out-patients were purposively selected for the study. Data were elicited with a well-structured questionnaire titled 'Personalized Meal Plan Questionnaire (PMPQ)' using a five-point Likert scale. Both descriptive and inferential statistics, including frequency counts, mean, standard deviation, and Pearson Product Moment Correlation (PPMC) at 0.05 level of significance and the Statistical software (SPSS version 25) package was used for data analysis. Findings revealed that majority (94.2%) of respondents were middle-aged (above 40 years), with females (55.5%) slightly more represented and a significant proportion (43.3%) had no formal education. The respondents generally acknowledged the benefits of adhering to personalized meal plans which includes improving their overall health (x=4.87) and having control of their eating habits (x=4.17), however, limited access to healthy food options (x=4.19) was a major challenge encountered. Factors that influenced their level of compliance was the ease to follow meal plan (x=4.58) and regular follow up by nutritionist/dietician. The study also found a significant relationship between perceived challenges and benefits of compliance (r = 0.393), as well as between influencing factors and benefits (r = 0.322). The study concludes that personalized meal planning is an effective approach to managing chronic diseases and improving patients' health status. It recommends intensified follow-up care and nutrition counselling to enhance adherence among out-patients.

Keywords: Personalized meal plan, Chronic diseases, Out-patients, Dietary compliance, Nutrition counselling

Introduction

The global rise in non-communicable diseases, particularly hypertension and diabetes, poses a serious public health challenge, especially in low- and middle-income countries like Nigeria (Akpo *et al.,* 2026). According to the World Health Organization (2013), both conditions are among the leading causes of morbidity and mortality worldwide, and continue to place immense strain on individuals, families, and healthcare systems. While, pharmaceutical interventions play a significant role in disease management, lifestyle modifications especially dietary changes are equally crucial in improving health outcomes and reducing the risk of complications.

Diabetes is a chronic condition that affects the body's ability to process glucose (World Health Organization, 2021). It occurs when the body either does not produce enough insulin, a hormone responsible for regulating blood sugar levels or cannot effectively utilize the insulin it produces which can damage organs and tissues over time (Food and Agriculture Organization, 2020). Management strategies may include adopting a healthy diet, engaging in regular physical activity and using medication or insulin therapy when necessary.

Hypertension, commonly known as high blood pressure, is also another chronic condition where the blood pressure in the arteries is consistently elevated. It is a leading cause of cardiovascular diseases including heart attacks, strokes and heart failure if left untreated (World Health Organization, 2023). Effective management of hypertension involves both lifestyle changes and medication as it is often called the 'silent killer' because it may not show any obvious signs until significant health complications arise. (Abera *et al.,* 2024).

A personalized meal plan is a customized guide that specifies what and when to eat food tailored to individual's unique nutritional needs, lifestyle and health objectives (Shyam, *et al.,* 2022). It is typically a detailed schedule of meals and snacks, portion sizes, food selection while considering factors such as calorie requirement, macronutrient balance, food allergies and intolerances. This meal plan aims to optimize nutrition, manage chronic conditions and enhance overall health and wellbeing.

One of the most effective dietary strategies for managing hypertension and diabetes is the use of personalized meal plans (Siyanbade *et al.* 2024). These are structured dietary guides tailored to an individual's health condition, nutritional needs, lifestyle, and cultural preferences. Personalized meal plans help patients maintain stable blood glucose levels, regulate blood pressure, and improve overall well-being (Jung *et al.* 2024). However, achieving consistent compliance with these meal plans remains a significant challenge for many patients. Factors such as limited nutritional knowledge, high cost of healthy foods, lack of social support, and poor health literacy often impede effective dietary adherence.

Problem Statement

Hypertension and type 2 diabetes mellitus (T2DM) are major non-communicable diseases (NCDs) that constitute an increasing public health challenge globally and in Nigeria. Both conditions are important contributors to cardiovascular, renal, neurological, ocular and other chronic complications, particularly when it remain undiagnosed or poorly controlled over a prolonged period (Nwankwo *et al.,* 2026). Individuals with blood pressure greater than 130/80mmHg particularly those with diabetes or other cardiovascular risk factors requires appropriate monitoring while a blood pressure greater than 140/90mmHg represents an established hypertension. Similarly, fasting plasma glucose greater than 7.0mmol/L or a 2-hours glucose greater than 11.1mmol/L represents a diagnostic range of diabetes (Uloko *et al.,* 2018 & Mustafa *et al.,* 2019). Treatment options exist, however, many patients struggle to manage these conditions effectively, often resulting in poor health outcomes and rising healthcare costs. In Nigeria, where a large portion of the population live below the poverty line and have limited access to dietitians or structured nutritional counseling, the importance of examining compliance to personalized dietary recommendations cannot be overemphasized (Olamoyegun *et. al,* 2024). Compliance to personalized meal plans is a vital component of managing these chronic illnesses, however, various barriers continue to hinder patient from better health outcomes. Hence, this study investigates the compliance to personalized meal plans among out patients at Kwara State University Teaching Hospital, Nigeria (KWASUTH).

Research Questions

The following research questions guided the study:

1. What are the benefits associated with the compliance to personalized meal plan among out-patients?
2. What are the perceived factors influencing out patient's compliance to personalized meal plan?
3. What are the challenges encountered on compliance to personalized meal plan?

Research Hypothesis

H_{01}: There is no significant relationship between challenges encountered and benefits associated with compliance to personalized meal plan.

Methodology

Research Design

This study employed a descriptive research design, which is appropriate for collecting data. A descriptive survey design was preferred for the study because information was gathered from individuals who are representative sample of the population.

Population of the Study

The population for this study consists of out-patients diagnosed with hypertension and diabetes who are following personalized meal plans at KWASUTH, Ilorin. As of January 2025, a total of three hundred and ten (310) hypertensive patients and two hundred and thirty-five (235) diabetic patients were identified from a review of patient records, giving a total of five hundred and forty-five (545) out-patients.

Sampling and Sampling Technique

The sample for the research consists five hundred and forty-five (545) out-patients visiting the hospital. In selecting the sample size for the research purposive sampling was adopted to select one hundred and twenty (120) respondents based on the health condition of the out-patients.

Instrument for Data Collection

The study used a well-structured questionnaire titled "Personalized Meal Planning Questionnaire" (PMPQ) to gather data. The instrument contained thirty-two (32) items that elicited information on their personal characteristics, benefits associated with compliance to personalized meal plan, perceived factors that influenced compliance and challenges encountered to compliance of personalized meal plan which was measured on a five (5) point Likert scale Strongly Agree (SA=5), Agree (A=4), Undecided (UD=3), Disagree (D=2), Strongly Disagree (SD=1).

The research instrument was subjected to expert validation to establish its adequacy and appropriateness for measuring the intended constructs. A pilot study was subsequently conducted among twenty (20) respondents who were not part of the study area. The reliability of the instrument was assessed using Cronbach's alpha coefficient, which yielded a value of 0.71. This result indicates an acceptable level of internal consistency and confirms the reliability of the instrument for the study.

Data Analysis Techniques

The data obtained from the questionnaire (PMPQ) was analyzed using descriptive and inferential statistical techniques. Descriptive statistics, including frequencies, means, and standard deviations, was used while inferential statistics, such as Pearson Product Moment Correlation (PPMC) was used.

Results

Table 1 presents the mean score and standard deviation on the benefits associated with compliance to personalized meal plans. From the table, all items were agreed; this is because they have a mid-mean score that are above of 3.00, these statement had the high mean score, that is, complying to personalized meal plan has improved their overall health (x=4.87), it has made them more confident in managing health conditions (x=4.47), have felt more in control of their eating habits since commencement of meal plan (x=4.17) and have experienced reduction in symptoms since complying to meal plan (x=4.04). This underscores the critical role of nutrition focused intervention in the management of chronic conditions.

Table 1: Mean Rating and standard deviation of respondents on benefits associated with complying to personalized meal plans

S/N	Statements	Mean	Standard Deviation
1.	I believe that complying to personalized meal plan has improved my overall health.	4.87	0.33
2.	I have experienced a reduction in my chronic disease symptoms since complying to a personalized meal plan.	4.04	0.52
3.	Complying to a personalized meal plan has helped me to manage my weight better.	3.74	0.88
4.	I have experienced an improvement in my mental health since complying to a personalized meal plan.	3.80	0.90
5.	I have experienced an improvement in my physical energy levels since complying to a personalized meal plan.	3.92	0.81
6.	I feel more in control of my eating habits due to following a personalized meal plan.	4.17	0.57
7.	I feel more knowledgeable about healthy eating because of my personalized meal plan.	3.55	0.75
8.	I am more confident in managing my health condition because of my personalized meal plan.	4.47	0.50
	Grand mean	**4.07**	

Table 2 presents the mean score and remarks on the perceived factors with compliance to personalized meal plans. From the table all items were agreed; this is because they have a mid-mean score that are above of 3.00, respondents attest to finding it easy to follow meal plan if it includes foods they enjoy (x=4.58), when they follow up with their dietician/nutritionist regularly (x=4.45), if it is tailored towards their specific meal preference (x=4.42) and they feel motivated to comply to a meal plan because of its potential health benefits (x=4.30).

Table 2: Mean Rating and standard deviation of respondents on perceived factors influences compliance to personalized meal plans among out-patients.

S/N	Statements	Mean	Standard Deviation
1.	Specific food preference (Vegan diet, Keto diet)	4.42	0.49

2.	Improved overall quality of life.	4.22	0.65
3.	Potential health benefits	4.30	0.63
4.	cultural and religious food preferences	3.41	1.02
5.	Regular follow-up with Nutritionist/dieticians	4.45	0.53
6.	Ease to follow when they include food preference.	4.58	0.52
	Grand Mean	**4.23**	

Table 3 presents the mean score and remarks on challenges encountered by out-patients with compliance to personalized meal plans. From the table seven items were agreed while one item was disagreed; this is because they have a mid-mean score that are above of 3.00 while the disagreed had a mid-mean score below 3.00. Limited access to food options in personalized meal plan (x=4.19), Cost of food (x=4.14), stress factors in following strict meal plan (x=3.87), inability to resist other foods that does not help with health (x=3.72) and disagreed to not getting enough support from family and friends (x=1.73).

Table 3: Mean Rating and standard deviation of respondents on challenges out-patients encountered in complying to personalized meal plans

S/N	Statements	Mean	Standard Deviation	Remark
1.	The cost of healthy food is a barrier to my compliance to a personalized meal plan.	4.14	0.65	Agreed
2.	I do not know much about healthy eating, which makes it hard for me to comply to a personalized meal plan.	3.65	1.24	Agreed
3.	I find it difficult to resist temptation of unhealthy foods.	3.72	1.09	Agreed
4.	I experience stress when trying to follow a personalized meal plan.	3.87	0.91	Agreed
5.	Limited access to healthy food options affects my ability to follow a personalized meal plan.	4.19	0.84	Agreed
6.	Social events and gatherings make it hard for me to stick to my personalized meal plan.	3.17	1.00	Agreed
7.	I do not get enough support from family or friends to follow my meal plan.	1.73	0.97	Disagreed
8.	I sometimes forget to follow my personalized meal plan.	3.52	1.03	Agreed
	Grand Mean	**3.50**		

Test of Hypothesis

Table 4 shows Pearson correlation coefficient (r-value) of 0.393** and a p-value of 0.000 testing at a significance level of 0.05, the p-value is less than the alpha level ($p<0.05$) therefore, the null hypothesis which states that 'There is no significant relationship between challenges encountered and benefits associated with complying with personalized meal plan is rejected. Consequently, there is a significant relationship between challenges encountered and benefits associated with complying to personalized meal plans.

Table 4: Summary of Pearson Product Moment Correlation between challenges encountered and benefits associated with complying to personalized meal plan

Variables	N	r-value	Sig.p(2 tailed)
Challenges Benefits	120	0.393**	0.000

Discussion

The study revealed that majority of respondents were females above forty years of age, aligning with global trends showing higher prevalence of hypertension and diabetes in older adults due to aging-related risk factors (Yusuf *et al.,* 2023). According to Alyafei and Daley (2025), older individuals are more susceptible to chronic illness and their nutritional needs require greater attention and support. This implies a critical need for consistent and structured dietary management, especially through personalized meal plans, to mitigate the health complications associated with these conditions. The higher prevalence of these conditions among females may reflect patterns in women's health-seeking behavior, which can also be influenced by caregiving responsibilities, dependency, social burdens, and cultural expectations. (Attah *et al.,* 2022).

Benefits associated with compliance included both physical and psychological improvements. Patients reported better control of blood pressure and blood sugar, enhanced energy levels, mood, and confidence, consistent with the findings of Azeez *et al.,* (2020) on the benefits of personalized dietary care, similarly, compliance to prescribed meal plan contributed to improved food knowledge and health literacy, as patients learned about portion sizes, food timing, and healthy choices over time. The inclusion of culturally appropriate meal plans also promoted long-term adherence, supporting the importance of personalized and culturally sensitive interventions.

The key factors that influenced compliance to personalized meal plan which is personal food preference especially foods they enjoy, follow-up support from dietician/nutritionist and cultural alignment. Patients felt more inclined to follow meal plans when their preferences are respected and when they received regular encouragement. This reflects the importance of patient-centered care which recognizes that individuals perceived benefits and cues to action can significantly influence their health-related behaviors (Odusanya, *et al.,* 2018). Several challenges hindered compliance, including high food costs, cravings for unhealthy foods, emotional stress, and limited nutrition education. This is particularly problematic in low-income setting where individuals often have to choose between nutritional value and affordability (Adisa, *et al.,* 2017). Even when they are aware of the importance of consuming healthier meals, the financial pressure prevents the sustainability of diets over time, this aligns with the findings of Babaita *et al.,* (2026), which attested that economic constraint is a major impediment to compliance among patients with chronic illnesses.

A significant relationship existed between the challenges encountered and the benefits associated with complying with personalized meal plan. This shows that out-patients encounters more challenges in adhering to their dietary plans and reflects a deeper understanding on how perceived outcomes can drive perseverance. This underscores a tailored support intervention such as food

substitutions, emotional counselling and follow-up care while reinforcing the benefits. (Omotayo *et al.,* 2018).

Conclusion and Recommendations

The study concluded that compliance with personalized meal plans significantly improves health outcomes among out-patients with hypertension and diabetes. Personalized diets help patients control symptoms, improve energy, build confidence in disease management, and develop healthier eating habits. However, compliance is affected by barriers such as high food costs, limited availability of healthy foods, stress, and inadequate nutrition knowledge. Patient-centered factors including food preferences, cultural suitability, motivation, and regular follow-up with dietitians also improve adherence. Therefore, successful dietary management requires personalized meal plans alongside interventions that address patients' economic, educational, emotional, and cultural needs. Based on the findings the following recommendations are made;

1. Nutritionists working in health centers should strengthen regular nutritional counselling and follow-up for out-patients on a personalized diet plan
2. Healthcare providers should develop affordable and culturally appropriate meal plans that consider patients' food preferences, cultural practices, and financial circumstances, while promoting locally available and affordable healthy foods.
3. The government should eliminate barriers that limit food production by ensuring economic policies to dietary compliance such as reduction to high food costs, limited access to healthy foods, stress, and inadequate nutrition knowledge.

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