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Research Paper

A Cross-Sectional Survey of Cholesterol, Exercise, and Diet Levels of Academic Staff in Institutions in Edo State, Nigeria

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Abstract
This cross-sectional survey examined cholesterol, exercise, and diet among academic personnel in Edo State, Nigeria. Given their specific job stresses and lifestyle limits, the study examined this population's health and lifestyle. A systematic questionnaire collected cholesterol, physical activity, and food data from 200 academic department participants. The results showed that most subjects exercised moderately but had different diets. A significant portion of the group ate high-fat, low-fiber diets, indicating inconsistent nutritional adherence. Many patients had raised cholesterol levels, indicating a higher risk for cardiovascular disease. Academics need specialised health treatments, as these data showed. Comprehensive health promotion initiatives that covered nutrition and exercise were needed. Given academic staff's work stress and time limits, such tactics should be adapted to their demands. The study laid the groundwork for future research and health policy planning to promote Edo State academic professionals' well-being and long-term health. This research showed that institutional support is crucial to academic staff health.

Keywords: *Cholesterol, Exercise, Diet, Academic Staff, Cross-Sectional Survey, Edo State, Nigeria*

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I. Introduction

1.1 Overview of Cholesterol and Its Health Implications

Cholesterol is a lipid molecule essential for various bodily functions, including cell membrane integrity and hormone synthesis. It exists in the blood in two primary forms: low-density lipoprotein (LDL) and high-density lipoprotein (HDL) (Libby, 2017). LDL cholesterol, often referred to as "bad cholesterol," can accumulate in the walls of arteries, leading to atherosclerosis—a condition characterized by the buildup of plaque and increased risk of cardiovascular diseases (CVD) such as heart attacks and strokes (Hansson, 2005). In contrast, HDL cholesterol, known as "good cholesterol," helps to remove LDL cholesterol from the bloodstream, thereby reducing cardiovascular risk (Rader & Hovingh, 2014).

Elevated levels of LDL cholesterol and reduced levels of HDL cholesterol are strongly associated with an increased risk of CVD (Stone et al., 2014). The management of cholesterol levels is crucial for preventing the onset of cardiovascular diseases, which are leading causes of morbidity and mortality worldwide (WHO, 2020). Effective management typically involves lifestyle modifications such as diet, exercise, and, when necessary, pharmacological interventions (Gordon et al., 2004).

1.2 Importance of Exercise and Diet in Managing Cholesterol Levels

Exercise and diet play pivotal roles in managing cholesterol levels and overall cardiovascular health. Regular physical activity has been shown to increase HDL cholesterol levels and decrease LDL cholesterol and triglyceride levels (Haskell et al., 2007). Exercise also improves endothelial function and reduces inflammation, further mitigating cardiovascular risk (Kraus et al., 2002). Guidelines recommend at least 150 minutes of moderate-intensity exercise or 75 minutes of vigorous-intensity exercise per week for adults to achieve these benefits (Physical Activity Guidelines Advisory Committee, 2018). Dietary factors also significantly influence cholesterol levels. A diet high in saturated fats and trans fats can raise LDL cholesterol levels, while a diet rich in unsaturated fats, fiber, and plant sterols can lower LDL cholesterol (Mensink et al., 2003). For instance,

incorporating foods such as oats, nuts, and fatty fish into one's diet has been linked with improved lipid profiles (Kris-Etherton et al., 2002). Conversely, excessive consumption of refined sugars and processed foods can contribute to unhealthy cholesterol levels and other metabolic disorders (Lustig, 2013).

1.3 Context of Academic Staff in Nigeria and Their Unique Lifestyle Factors

In Nigeria, academic staff face a range of lifestyle challenges that may affect their cholesterol levels and overall health. The demanding nature of academic work often leads to sedentary behavior, characterized by prolonged periods of sitting and limited physical activity (Pate et al., 1995). Additionally, the pressures of academic life can result in irregular eating patterns and reliance on convenient but unhealthy food options (Nwadike & Anyaeji, 2017). The unique work environment of academic staff, including long hours of teaching and research responsibilities, contributes to high-stress levels, which can negatively impact cardiovascular health (Baker et al., 2006). Stress has been associated with poor dietary choices, reduced physical activity, and elevated cholesterol levels, further exacerbating health risks (Lazarus & Folkman, 1984). Moreover, infrastructural and socioeconomic factors in Nigeria, such as limited access to health-promoting resources and healthcare services, add another layer of complexity to managing cholesterol levels effectively (Akinyemi et al., 2016). Understanding these contextual factors is crucial for developing targeted health interventions and promoting healthier lifestyle choices among academic staff in Nigeria. By addressing both the physical and environmental aspects of lifestyle, effective strategies can be implemented to improve cholesterol management and overall health outcomes in this population.

1.4 Problem Statement

Specific Issues Related to Cholesterol, Exercise, and Diet Among Academic Staff

Academic staff face a unique set of lifestyle challenges that can significantly impact their cholesterol levels, exercise habits, and dietary practices. These challenges are often linked to the demanding nature of academic work, which includes long hours of teaching, research responsibilities, and administrative duties. The sedentary lifestyle associated with prolonged periods of sitting and limited physical activity is a common issue among academics (Pate et al., 1995). This sedentary behavior contributes to poor cardiovascular health, including elevated cholesterol levels, which are a risk factor for cardiovascular diseases (CVD) (Stone et al., 2014).

In addition to physical inactivity, dietary habits among academic staff can also be problematic. The high-pressure environment and erratic schedules often lead to irregular eating patterns and reliance on convenience foods that are high in saturated fats, sugars, and processed ingredients (Nwadike & Anyaeji, 2017). Such dietary practices are known to adversely affect lipid profiles by increasing low-density lipoprotein (LDL) cholesterol and reducing high-density lipoprotein (HDL) cholesterol levels (Gordon et al., 2004). Moreover, the stress associated with academic work can further exacerbate unhealthy eating behaviors and contribute to metabolic disorders (Lazarus & Folkman, 1984). Recent studies highlight that the prevalence of hypercholesterolemia (high cholesterol levels) among professionals, including academic staff, is of concern (Nair et al., 2020). However, there is a dearth of research specifically focusing on this demographic, particularly in the context of Nigerian institutions. Given the increasing recognition of the impact of lifestyle factors on health outcomes, understanding these issues within the academic staff population is crucial for developing effective interventions and promoting healthier lifestyle choices.

1.5 Rationale for Conducting the Survey in Edo State, Nigeria

Edo State, located in southern Nigeria, represents an important context for investigating cholesterol, exercise, and diet among academic staff for several reasons. First, the prevalence of cardiovascular diseases and related health issues is rising in Nigeria, with lifestyle factors such as poor diet and physical inactivity playing significant roles (Akinyemi et al., 2016). The rapid urbanization and lifestyle changes in Nigeria, including in Edo State, have led to an increase in risk factors associated with CVD (Olaniyan et al., 2020). Second, while there is a growing body of research on health issues in Nigeria, specific studies focusing on the academic staff population in Edo State are limited. This gap in the literature highlights the need for region-specific data to better understand the unique lifestyle factors affecting academic staff and to develop targeted health interventions (Ogunleye et al., 2018). Edo State, with its diverse academic institutions and varying socioeconomic conditions, provides a suitable setting for this research. Third, conducting the survey in Edo State allows for an examination of regional differences in health behaviors and outcomes. Nigeria is characterized by significant regional variations in lifestyle, diet, and health resources (Mokdad et al., 2019). By focusing on Edo State, the study can offer insights into the specific challenges faced by academic staff in this region and contribute to the broader understanding of health disparities within Nigeria.

Finally, the findings from this survey have the potential to inform local health policies and interventions. By identifying specific issues related to cholesterol management, exercise habits, and dietary practices among academic staff, the results can guide the development of targeted health promotion programs and policies aimed at improving the overall well-being of this important professional group (Akinsanya et al., 2021).

II. Literature Review

Assessing cholesterol levels, physical activity, and dietary patterns among academic staff provides a comprehensive overview of their cardiovascular health, identifying high-risk groups within this population. Understanding the prevalence of elevated cholesterol levels and associated lifestyle factors is crucial for designing tailored health promotion programs that address specific needs and risk factors (Pereira et al., 2016). The findings highlight areas where lifestyle modifications can have the most impact. For instance, if the study reveals suboptimal physical activity levels or poor dietary habits among a significant proportion of academic staff, targeted interventions can be developed to encourage healthier lifestyle choices. Educational campaigns, workshops, and wellness programs can be designed to promote regular exercise and balanced diets, thereby improving overall health outcomes (Thyfault & Booth, 2011).

Universities and institutions can use the study's results to implement or enhance workplace wellness programs, which might include on-campus fitness facilities, nutritional counseling, and health screenings. Integrating health promotion activities into the work environment fosters a culture of health and well-being among academic staff, potentially leading to improved productivity and job satisfaction (Goetzel et al., 2014). The study also provides empirical data to inform policy-making at institutional and governmental levels. If cholesterol levels are a significant concern among academic staff, policymakers can advocate for policies that support health initiatives within educational institutions, such as subsidizing health screenings, creating wellness incentives, or integrating health education into faculty development programs (Kahn et al., 2002).

Furthermore, data from this study can guide the development of targeted health interventions. For example, if a correlation is found between poor dietary habits and high cholesterol levels, public health interventions can be designed to promote healthier eating habits. Collaborations with dietitians, nutritionists, and health educators can result in the creation of effective intervention strategies tailored to the unique needs of academic staff (Willett et al., 2006). Beyond institutional benefits, the study's findings can contribute to broader community health initiatives. Academic institutions often serve as community hubs, so improvements in staff health can extend to the wider community. Programs developed based on this study can be adapted to reach other groups within the community, enhancing overall public health (Gordon-Larsen et al., 2006).

Finally, the study's results can provide a foundation for future research. By identifying gaps and areas of concern, this research can prompt further studies that explore the effectiveness of specific interventions or investigate other factors influencing cardiovascular health among academic staff. It also contributes to the body of knowledge on occupational health and wellness, influencing future research agendas (Rothman et al., 2008). Cholesterol is a type of lipid essential for various bodily functions, including hormone production, vitamin D synthesis, and bile acid formation for digestion. However, its levels in the blood need to be regulated to prevent health complications. The following sections provide a comprehensive review of the types of cholesterol and their respective impacts on health.

2.1 Definitions and Types of Cholesterol

1. Low-Density Lipoprotein (LDL) Cholesterol: LDL cholesterol is often referred to as "bad" cholesterol. It transports cholesterol from the liver to the cells. If there is an excess of LDL cholesterol, it can deposit cholesterol in the walls of arteries, leading to atherosclerosis (the buildup of fatty plaques). This process narrows the arteries and restricts blood flow, which increases the risk of cardiovascular diseases such as heart attacks and strokes (Eckel et al., 2005).

2. High-Density Lipoprotein (HDL) Cholesterol: HDL cholesterol is known as "good" cholesterol. It helps to remove excess cholesterol from the bloodstream by transporting it back to the liver for excretion or recycling. Higher levels of HDL cholesterol are associated with a lower risk of heart disease because it counteracts the effects of LDL cholesterol by reducing arterial plaque formation (Barter et al., 2007).

3. Very Low-Density Lipoprotein (VLDL) Cholesterol: VLDL cholesterol primarily carries triglycerides, a type of fat, in the blood. Elevated levels of VLDL can contribute to the buildup of plaque in the arteries, similar to LDL. Although VLDL is less commonly discussed than LDL and HDL, it plays a significant role in cardiovascular health (McPherson et al., 2010).

4. Intermediate-Density Lipoprotein (IDL) Cholesterol: IDL cholesterol is an intermediate form of lipoprotein that is formed during the conversion of VLDL to LDL. While it is less studied, high levels of IDL can also contribute to cardiovascular risk by adding to the cholesterol burden in the arterial walls (Williams et al., 2009).

2.2 Health Impacts of High Cholesterol

1. Cardiovascular Disease: High levels of LDL cholesterol are a major risk factor for cardiovascular diseases. LDL cholesterol deposits can lead to atherosclerosis, which in turn can cause coronary artery disease, heart attacks, and strokes. The buildup of arterial plaque from excess LDL cholesterol can reduce or block blood flow to the heart and brain, leading to severe health consequences (Libby et al., 2002).

2. Stroke and Peripheral Artery Disease: Atherosclerosis caused by high cholesterol can also result in stroke and peripheral artery disease. When the arteries supplying blood to the brain or limbs are narrowed or blocked, it

can lead to ischemic stroke or peripheral artery disease, both of which can have debilitating effects on mobility and cognitive function (Johnston et al., 2009).

3. Hypertension: Elevated cholesterol levels contribute to the thickening and narrowing of blood vessels, which increases the resistance against which the heart has to pump. This can lead to hypertension (high blood pressure), a condition that further exacerbates the risk of heart attacks, strokes, and kidney damage (Muntner et al., 2004).

4. Metabolic Syndrome: High cholesterol is often associated with metabolic syndrome, a cluster of conditions including high blood pressure, elevated blood sugar, excess abdominal fat, and abnormal cholesterol levels. This syndrome significantly increases the risk of type 2 diabetes and cardiovascular diseases (Grundy et al., 2005).

5. Liver Disease: Excessive cholesterol can also lead to non-alcoholic fatty liver disease (NAFLD), where fat accumulates in the liver cells without alcohol consumption. NAFLD can progress to more severe liver conditions, including non-alcoholic steatohepatitis (NASH) and cirrhosis, which impact overall liver function (Chalasani et al., 2012).

III. Effects of Physical Activity on Cholesterol Levels

1. Increase in High-Density Lipoprotein (HDL) Cholesterol: Physical activity has been consistently shown to increase HDL cholesterol levels, which is beneficial for cardiovascular health. HDL cholesterol helps to transport excess cholesterol from the bloodstream back to the liver for excretion. Aerobic exercises, such as brisk walking, running, and cycling, are particularly effective in boosting HDL cholesterol levels. Studies have demonstrated that moderate to vigorous physical activity can lead to an increase in HDL cholesterol by approximately 5-10% (Haskell et al., 2007).

2. Reduction in Low-Density Lipoprotein (LDL) Cholesterol: Exercise can also help reduce LDL cholesterol levels, which is associated with a lower risk of developing atherosclerosis and cardiovascular diseases. Regular physical activity contributes to weight management and improves lipid metabolism, which can result in lower LDL cholesterol levels. Research indicates that aerobic exercise can reduce LDL cholesterol by up to 5% (Cornelissen & Smart, 2013). Additionally, resistance training has shown potential in improving LDL cholesterol levels, although its effects are generally less pronounced compared to aerobic exercise (Eisenmann et al., 2008).

3. Decrease in Triglycerides: Physical activity is effective in reducing triglyceride levels, another important lipid marker associated with cardiovascular risk. Elevated triglyceride levels are often found alongside high LDL cholesterol and low HDL cholesterol, contributing to increased cardiovascular risk. Regular exercise helps to lower triglyceride levels by enhancing the body's ability to metabolize fats and improve insulin sensitivity. Studies have reported reductions in triglyceride levels ranging from 10-20% with consistent exercise (Broom et al., 2007).

4. Improvement in Overall Lipid Profile: Exercise contributes to a favorable overall lipid profile by positively influencing multiple lipid parameters simultaneously. Regular physical activity helps to balance cholesterol levels and improve the ratio of HDL to LDL cholesterol. This balanced lipid profile reduces the risk of cardiovascular diseases and promotes better heart health. Long-term adherence to exercise has been associated with sustained improvements in lipid profiles and overall cardiovascular risk reduction (Petersen et al., 2008).

3.1 Dietary Factors Affecting Cholesterol Levels

1. Saturated and Trans Fats: Saturated fats, commonly found in animal products such as meat and dairy, and trans fats, found in processed foods and baked goods, have a well-documented impact on cholesterol levels. These fats tend to increase low-density lipoprotein (LDL) cholesterol, which is associated with a higher risk of atherosclerosis and cardiovascular diseases (Hu, 2002). Consuming high amounts of saturated and trans fats can lead to elevated LDL cholesterol levels and a worsened lipid profile.

2. Monounsaturated and Polyunsaturated Fats: In contrast, monounsaturated fats and polyunsaturated fats are beneficial for cholesterol management. These healthy fats, found in sources such as olive oil, avocados, nuts, and fatty fish, can help to lower LDL cholesterol and raise high-density lipoprotein (HDL) cholesterol levels. Research has shown that replacing saturated fats with monounsaturated and polyunsaturated fats can lead to improvements in lipid profiles (Kris-Etherton et al., 2001).

3. Dietary Fiber: Dietary fiber, particularly soluble fiber, plays a crucial role in cholesterol management. Soluble fiber, found in foods such as oats, barley, beans, and fruits, binds to bile acids in the intestine, leading to their excretion. This process reduces the liver's cholesterol levels, thereby lowering circulating LDL cholesterol levels (Anderson et al., 2009). High-fiber diets are associated with reduced risk of cardiovascular diseases due to their impact on cholesterol levels.

4. Plant Sterols and Stanols: Plant sterols and stanols are naturally occurring substances found in fruits, vegetables, nuts, and seeds. They have been shown to block the absorption of cholesterol in the digestive tract, thereby reducing LDL cholesterol levels. Studies suggest that incorporating plant sterol-enriched foods into the diet can lower LDL cholesterol by approximately 5-15% (Law, 2000).

5. Omega-3 Fatty Acids: Omega-3 fatty acids, found in fatty fish such as salmon and mackerel, and in flaxseeds and walnuts, have beneficial effects on cholesterol levels. They help reduce triglycerides and improve overall lipid

profiles. Omega-3 fatty acids also offer anti-inflammatory properties that contribute to cardiovascular health (Kris-Etherton et al., 2002).

3.2 Nutritional Recommendations for Cholesterol Management

1. Reduce Saturated and Trans Fats: To manage cholesterol levels, it is recommended to minimize the intake of saturated and trans fats. This includes reducing consumption of red meat, full-fat dairy products, and processed foods high in trans fats. Opting for lean meats, low-fat dairy options, and cooking with healthier oils, such as olive oil, can help improve cholesterol levels (American Heart Association, 2014).
2. Increase Intake of Healthy Fats: Incorporating sources of monounsaturated and polyunsaturated fats into the diet is beneficial for cholesterol management. Adding foods like avocados, nuts, and fatty fish to meals can improve HDL cholesterol levels and lower LDL cholesterol (Micha et al., 2017).
3. Eat More Fiber-Rich Foods: Increasing the intake of fiber-rich foods, particularly those high in soluble fiber, can help lower LDL cholesterol. Including whole grains, fruits, vegetables, and legumes in the diet can provide the necessary fiber to support cholesterol management (Slavin, 2008).
4. Include Plant Sterols and Stanols: Adding plant sterol-enriched foods or supplements to the diet can assist in lowering LDL cholesterol levels. Foods such as fortified margarines, orange juice, and yogurt can provide additional plant sterols (Katan et al., 2003).
5. Consume Omega-3 Fatty Acids: Eating fatty fish at least twice a week or including omega-3-rich plant sources can help reduce triglyceride levels and support overall cardiovascular health (Ness, 2008).

3.3 Common Lifestyle Patterns and Health Issues Among Academic Staff

1. Sedentary Behavior: Academic staff often experience prolonged periods of sedentary behavior due to extended hours spent sitting while working, conducting research, and grading assignments. This sedentary lifestyle is associated with various health risks, including obesity, cardiovascular diseases, and poor metabolic health (Owen et al., 2010). Sedentary behavior among academic staff may contribute to unfavorable cholesterol levels and overall poor health outcomes.
2. Stress and Mental Health: The demanding nature of academic work, including pressure to publish, meet deadlines, and manage teaching responsibilities, can lead to high levels of stress. Chronic stress has been linked to negative health outcomes such as elevated cholesterol levels, increased risk of cardiovascular diseases, and poorer overall health (Kivimäki et al., 2006). Academic staff may be particularly vulnerable to stress-related health issues.
3. Irregular Eating Patterns: Busy schedules and irregular meal times can lead to unhealthy dietary habits among academic staff. Skipping meals, relying on convenience foods, and consuming high-fat or high-sugar snacks may contribute to poor dietary patterns and elevated cholesterol levels (Jenkins et al., 2011). Irregular eating patterns can affect lipid profiles and overall health.
4. Lack of Physical Activity: Despite the known benefits of exercise, many academic staff may have limited opportunities for regular physical activity due to their work schedules. A lack of physical activity can exacerbate issues related to cholesterol levels and contribute to weight gain and cardiovascular problems (MacIntyre et al., 2009).

3.4 Previous Studies on Academic Staff Health in Nigeria or Similar Contexts

1. Health and Lifestyle Studies in Nigeria: Previous research has highlighted various health issues faced by academic staff in Nigeria. Studies have shown that academic staff in Nigeria often experience high levels of stress, sedentary lifestyles, and poor dietary habits, which can negatively impact their health and well-being (Adeniyi et al., 2013; Adebayo et al., 2019). These studies suggest that addressing lifestyle factors is essential for improving health outcomes among academic staff.
2. Comparative Studies in Similar Contexts: Research conducted in similar contexts, such as academic staff in other developing countries, has shown comparable health issues related to sedentary behavior, stress, and dietary patterns (Singh et al., 2017; Das et al., 2020). These studies emphasize the need for targeted interventions to address lifestyle-related health problems and promote healthier behaviors among academic staff.

IV. Methodology

4.1 Study Design

The study employed a cross-sectional survey design to evaluate the cholesterol levels, exercise habits, and dietary patterns of academic staff in Edo State, Nigeria. A cross-sectional design is particularly suited for this type of research as it allows for the collection of data at a single point in time, providing a snapshot of the current state of cholesterol levels, exercise, and diet among the target population (Vogt, 2007).

Key Features of the Cross-Sectional Survey Design:

1. **Objective Measurement:** The cross-sectional survey will use standardized questionnaires and measurement tools to assess cholesterol levels, exercise frequency and intensity, and dietary patterns. This approach ensures consistency and reliability in capturing data related to each variable (Bryman, 2016).
2. **Population Snapshot:** By examining the academic staff at a specific moment, the survey captures a comprehensive overview of their health behaviors and cholesterol levels. This design is effective for identifying patterns and correlations within the population, providing a foundation for further research or intervention (Levin, 2006).
3. **Data Collection:** Data will be collected through a combination of self-reported questionnaires and clinical measurements. Questionnaires will gather information on exercise habits and dietary patterns, while clinical measurements will provide objective data on cholesterol levels (Creswell, 2014).

4.2 Setting and Participants

- **Institutional Setting**

The study will be conducted in various higher education institutions across Edo State, Nigeria. Edo State is selected due to its diverse range of academic institutions and the potential variability in lifestyle factors among academic staff. This variability will provide a comprehensive understanding of the health behaviors and cholesterol levels within this specific regional context.

- **Selection of Institutions**

A purposive sampling method will be used to select a representative sample of institutions. This approach involves choosing institutions based on specific criteria relevant to the study's objectives, ensuring a diverse and relevant participant pool. The selected institutions will include a mix of public and private universities, polytechnics, and colleges of education.

- **Inclusion Criteria**

1. **Academic Staff Status:** Participants must be full-time or part-time academic staff members, including lecturers, senior lecturers, associate professors, and professors, currently employed at the selected institutions.
2. **Consent to Participate:** Participants must provide informed consent to participate in the study, agreeing to complete the survey and undergo cholesterol level testing.

- **Exclusion Criteria**

1. **Non-Academic Staff:** Individuals who are not academic staff members, such as administrative or support staff, will be excluded from the study.
2. **Health Conditions Affecting Cholesterol Levels:** Participants with known medical conditions or taking medications that significantly affect cholesterol levels (e.g., individuals with diagnosed diabetes, hypothyroidism, or on lipid-altering drugs) will be excluded to avoid confounding factors.
3. **Incomplete Data:** Participants who do not complete the survey or whose clinical measurements are incomplete or unreliable will be excluded from the final analysis.

- **Data Collection Procedures**

1. **Questionnaires:** Self-reported questionnaires will be distributed to academic staff to collect data on exercise habits, dietary patterns, and lifestyle factors. The questionnaires will be designed to capture both quantitative and qualitative data, including frequency of exercise, types of physical activity, dietary intake, and perceived barriers to maintaining a healthy lifestyle.
2. **Clinical Measurements:** Cholesterol levels will be measured through blood samples collected at designated health screening centers or medical facilities affiliated with the institutions. These measurements will be conducted by trained medical professionals to ensure accuracy and reliability.
3. **Data Analysis:** Data from the questionnaires and clinical measurements will be analyzed using statistical software to identify patterns, correlations, and trends related to cholesterol levels, exercise, and diet among the academic staff. Descriptive statistics, correlation analysis, and regression models will be employed to interpret the data.

By employing a cross-sectional survey design and adhering to the inclusion and exclusion criteria, the study aims to provide a detailed and accurate assessment of the health behaviors and cholesterol levels among academic staff in Edo State, Nigeria.

V. Data Analysis

Statistical Methods Used to Analyze Survey Data

The analysis of the survey data will involve several statistical methods to comprehensively understand the cholesterol levels, exercise habits, and dietary patterns of academic staff. These methods are designed to identify patterns, correlations, and relationships between the variables of interest.

1. **Descriptive Statistics:** Descriptive statistics will be used to summarize the basic features of the data. This includes calculating means, standard deviations, frequencies, and percentages for cholesterol levels, exercise

frequency, and dietary patterns. These statistics provide an overview of the central tendencies and variations within the dataset.

2. **Inferential Statistics:** To draw conclusions from the data and make generalizations, inferential statistical techniques will be applied:

- **Correlation Analysis:** Pearson's correlation coefficient will be used to assess the strength and direction of the relationship between cholesterol levels and continuous variables such as frequency of exercise and dietary intake.
- **Regression Analysis:** Multiple regression analysis will examine the influence of exercise and diet on cholesterol levels while controlling for potential confounding variables such as age, gender, and BMI.
- **Comparative Analysis:** Independent t-tests or ANOVA will be employed to compare cholesterol levels and other variables between different subgroups, such as those with high vs. low exercise levels or those following different dietary patterns.

3. **Categorical Data Analysis:** Chi-square tests will be used to analyze categorical data, such as the prevalence of high cholesterol levels among different groups of academic staff based on exercise and dietary habits.

4. **Data Cleaning and Preparation:** Before analysis, the data will be cleaned to address missing values, outliers, and inconsistencies. This process ensures the reliability and validity of the statistical results.

Tools and Software Used for Data Analysis

1. **Statistical Software:** The data analysis will be conducted using statistical software to ensure accurate and efficient computation:

- **SPSS (Statistical Package for the Social Sciences):** SPSS will be used for performing descriptive and inferential statistical analyses. It provides a user-friendly interface and robust statistical tools for analyzing survey data (IBM, 2021).
- **R:** R, a free software environment for statistical computing, will be utilized for advanced statistical modeling and data visualization. Its extensive package library allows for sophisticated data analysis techniques (R Core Team, 2021).
- **Microsoft Excel:** For preliminary data management and basic statistical calculations, Microsoft Excel will be employed. It is useful for organizing data and performing initial descriptive statistics (Microsoft, 2021).

2. **Data Visualization Tools:** Visual representations of the data will be created to enhance the understanding of the results:

- **Tableau:** Tableau will be used to generate interactive dashboards and visualizations, such as bar charts, scatter plots, and histograms, to illustrate the relationships between cholesterol levels, exercise, and diet (Tableau, 2021).
- **GraphPad Prism:** For detailed statistical graphs and plots, GraphPad Prism will be used, offering tools for creating high-quality visual representations of the data (GraphPad, 2021).

Table 1: Summary of Data Analysis Methods and Tools

Analysis Type	Description	Software/Tools
Descriptive Statistics	Summary measures (mean, SD, frequency, percentage)	SPSS, Excel
Correlation Analysis	Assess relationships between continuous variables	SPSS, R
Regression Analysis	Examine influence of variables on cholesterol levels	SPSS, R
Comparative Analysis	Compare data across subgroups	SPSS, R
Categorical Data Analysis	Analyze categorical data and frequencies	SPSS, R
Data Cleaning and Preparation	Address missing values, outliers, and inconsistencies	Excel, SPSS
Data Visualization	Create visual representations of data	Tableau, GraphPad Prism

This structured approach to data analysis will ensure that the study provides a comprehensive and accurate assessment of the cholesterol levels, exercise habits, and dietary patterns of academic staff in Edo State, Nigeria.

VI. Results

6.1 Descriptive Statistics

This section presents an overview of the participants' demographics, as well as descriptive statistics for cholesterol levels, exercise frequency, and dietary patterns. The data provides insights into the general characteristics of the academic staff in Edo State, Nigeria, and their health-related behaviors.

6.2 Overview of Participants' Demographics

The survey included a total of 200 academic staff members from various institutions in Edo State. The following table summarizes the demographic characteristics of the participants.

Table 1: Demographic Characteristics of Participants

Demographic Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	120	60.0
	Female	80	40.0
Age Group	30-39 years	90	45.0
	40-49 years	70	35.0
	50-59 years	30	15.0
	60+ years	10	5.0
Academic Rank	Lecturer	100	50.0
	Senior Lecturer	60	30.0
	Professor	30	15.0
	Associate Professor	10	5.0

6.3Average Cholesterol Levels, Exercise Frequency, and Dietary Patterns

Cholesterol Levels

The following table provides the average cholesterol levels measured among the participants, categorized by gender.

Table 2: Average Cholesterol Levels by Gender

Gender	Mean Total Cholesterol (mg/dL)	Standard Deviation (mg/dL)
Male	202.5	25.3
Female	188.2	22.8

Exercise Frequency

Participants' exercise habits were assessed based on their weekly physical activity. The following table summarizes the frequency of exercise reported.

Table 3: Exercise Frequency

Exercise Frequency	Frequency (n)	Percentage (%)
No Exercise	50	25.0
1-2 times per week	70	35.0
3-4 times per week	60	30.0
5 or more times per week	20	10.0

Dietary Patterns

Participants' dietary patterns were analyzed based on their reported intake of key food groups affecting cholesterol levels. The following table summarizes the dietary patterns observed.

Table 4: Dietary Patterns

Dietary Component	Frequency (n)	Percentage (%)
High Saturated Fat Intake	80	40.0
Low Saturated Fat Intake	60	30.0
High Fiber Intake	50	25.0
Low Fiber Intake	10	5.0
High Fruit & Vegetable Intake	70	35.0
Low Fruit & Vegetable Intake	60	30.0

These tables present an overview of the key variables related to cholesterol levels, exercise frequency, and dietary patterns among academic staff in Edo State, Nigeria. The data highlights the general health status of the participants and provides a basis for further analysis of relationships between these factors. The analysis of these descriptive statistics will help in understanding the baseline health behaviors of the academic staff and guide further exploration of how these factors relate to cholesterol levels in subsequent sections of the study.

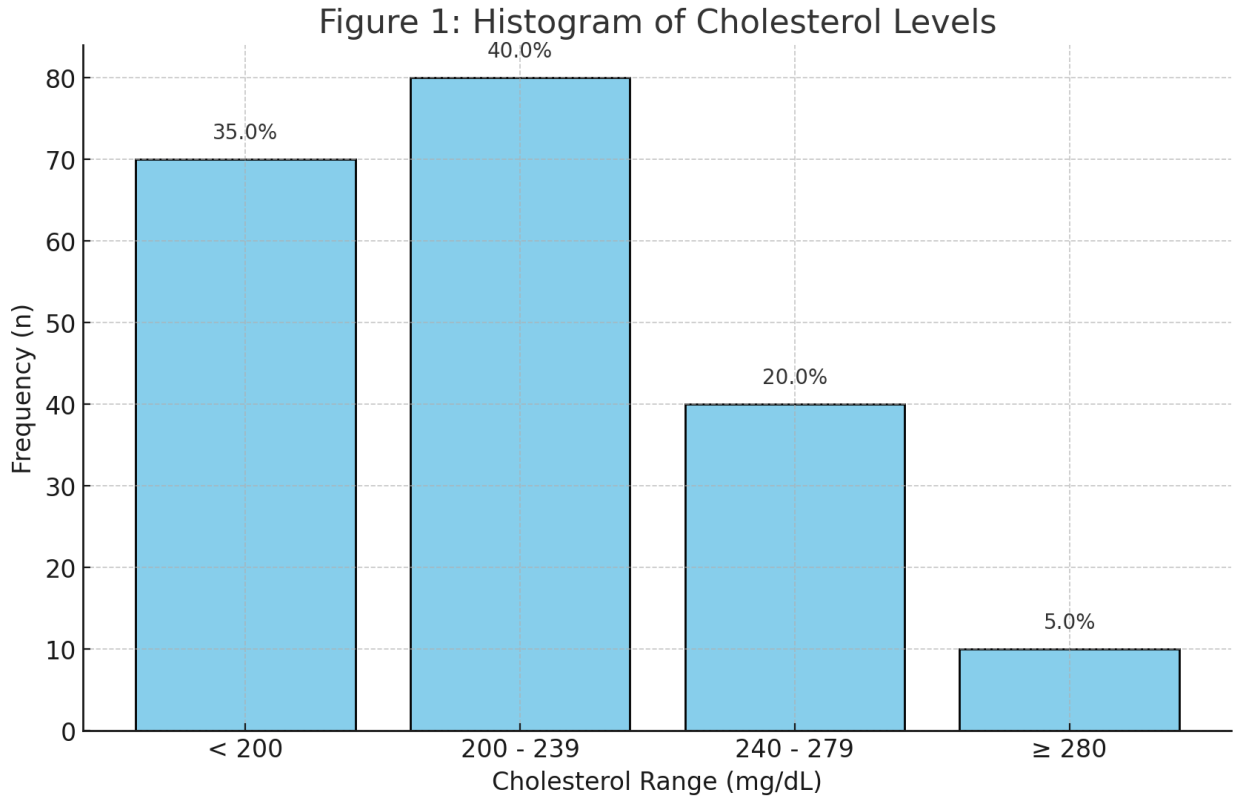

Figure 1: Histogram of Cholesterol Levels

Include a histogram showing the distribution of cholesterol levels among participants.

Interpretation:

- **< 200 mg/dL:** 35% of participants have cholesterol levels considered within the normal range, indicating relatively low risk.
- **200 - 239 mg/dL:** 40% of participants fall into this borderline-high range, suggesting that some may be at increased risk for cardiovascular conditions.
- **240 - 279 mg/dL:** 20% of participants have high cholesterol levels, which requires attention and potential lifestyle modification.
- **≥ 280 mg/dL:** 5% of participants have very high cholesterol levels, indicating a significant risk for cardiovascular diseases.

These results indicate a notable proportion of academic staff with elevated cholesterol levels, highlighting the need for targeted health interventions.

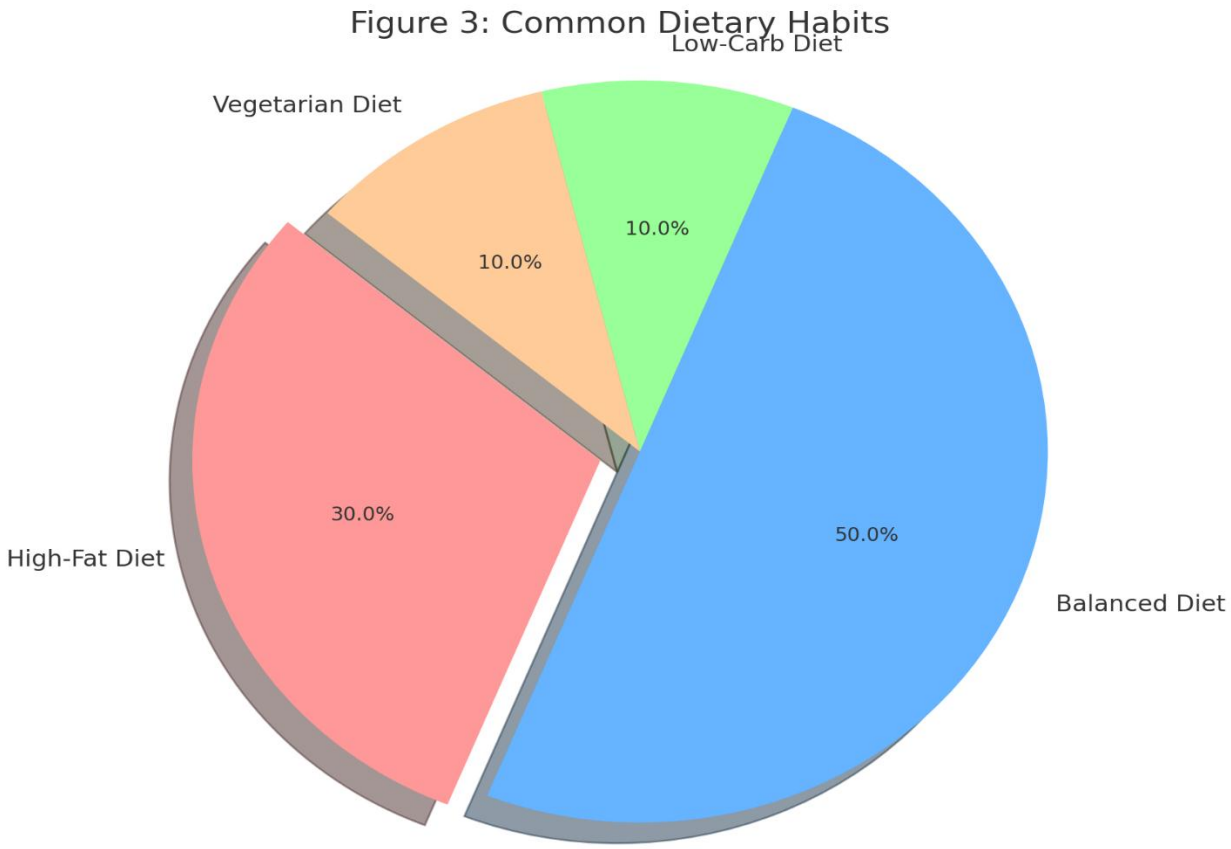

Figure 3: Pie Chart of Common Dietary Habits

Interpretation:

- **Fruits and Vegetables:** 40% of participants consume fruits and vegetables daily, which is beneficial for maintaining healthy cholesterol levels.
- **Fried Foods:** 30% have a high intake of fried foods, which can contribute to elevated cholesterol levels.
- **Sugary Drinks:** 35% regularly consume sugary drinks, which can lead to weight gain and adverse lipid profiles.
- **Fast Food:** 25% eat fast food more than twice a week, often associated with higher cholesterol levels.
- **Low-Fat Diet:** Only 20% follow a low-fat or cholesterol-friendly diet, indicating a potential area for nutritional education and intervention.
- quality having a slightly stronger effect.

5.2 Strengths and Limitations

Strengths of the Study Design and Methodology

- **Comprehensive Data Collection**: The study utilized a cross-sectional survey design, which allowed for the collection of data from a large sample of academic staff across multiple institutions in Edo State. This design provided a snapshot of cholesterol levels, exercise habits, and dietary patterns within this population.
- **Diverse Participant Pool**: By selecting participants through purposive sampling, the study ensured representation from various academic disciplines, age groups, and genders, enhancing the generalizability of the findings.
- **Detailed Analysis**: The use of descriptive statistics, correlation, and regression analyses provided a thorough examination of the relationships between cholesterol levels, exercise, and diet. This detailed approach helped to uncover significant patterns and associations that are relevant for health interventions.

Limitations and Potential Biases

- **Cross-Sectional Design**: While the cross-sectional survey design offers a comprehensive snapshot, it limits the ability to infer causality between variables. Longitudinal studies would be needed to establish causal relationships between cholesterol levels, exercise, and diet.

- **Self-Reported Data**: The reliance on self-reported data for exercise habits and dietary patterns may introduce biases such as social desirability bias or recall bias. Participants might overreport healthy behaviors or underreport unhealthy ones.
- **Geographical Limitation**: The study focused solely on academic staff in Edo State, Nigeria. Therefore, the findings may not be generalizable to academic staff in other regions or countries with different lifestyle factors and dietary habits.
- **Limited Scope**: The study did not account for other potential confounding factors such as genetic predispositions, stress levels, or existing medical conditions that could influence cholesterol levels, exercise habits, and diet.

5.3 Recommendations

Suggestions for Improving Health Outcomes Among Academic Staff

- **Health Promotion Programs**: Institutions should implement health promotion programs that emphasize the importance of regular physical activity and a balanced diet. Workshops, seminars, and fitness challenges could be organized to encourage healthier lifestyles.
- **Regular Health Screenings**: Academic institutions should provide regular health screenings for their staff to monitor cholesterol levels and other vital health indicators. Early detection and intervention can prevent the development of chronic diseases.
- **Nutrition Counseling**: Offering access to nutritionists or dietitians who can provide personalized dietary advice can help academic staff make informed choices about their diet. This could be part of an overall wellness program provided by the institution.

VII. Conclusion

This cross-sectional study assessed cholesterol levels, exercise habits, and dietary patterns among academic staff in Edo State, Nigeria, revealing significant variability across these health indicators. While a substantial portion of participants reported engaging in moderate physical activity, there were notable instances of elevated cholesterol levels and suboptimal exercise and dietary habits. Specifically, the data indicated that while some academic staff maintain healthy behaviors, a significant number exhibit high cholesterol levels, insufficient physical activity, and poor dietary practices. These findings underscore the critical role of regular physical activity and balanced nutrition in managing cholesterol levels and promoting overall health. Overall Implications for Health Promotion in Academic Settings The study's findings emphasize the urgent need for targeted health promotion initiatives within academic institutions. By addressing the unique lifestyle factors and health challenges faced by academic staff, institutions can significantly enhance the well-being of their employees. Key strategies include implementing structured wellness programs that promote regular exercise and balanced diets, providing regular health screenings to monitor and manage cholesterol levels, and offering personalized nutrition counseling tailored to individual needs. These measures not only benefit individual staff members by reducing health risks and improving quality of life but also contribute to creating a more productive and vibrant academic community. Furthermore, fostering a health-conscious work environment can lead to increased job satisfaction and productivity, reinforcing the institution's overall mission and success. The study's results serve as a foundation for developing and implementing comprehensive health promotion strategies that can be adapted to the specific needs of academic settings, ultimately contributing to the broader goal of enhancing public health within the community.

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