Original Article

FROM KNOWLEDGE TO ACTION: UNDERSTANDING CARDIOVASCULAR RISK FACTORS AMONG UNIVERSITY STUDENTS IN NORTH-CENTRAL NIGERIA

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Abstract

Background: The high prevalence of cardiovascular disease (CVD) risk factors among university students, combined with this critical stage for habit formation, highlights the urgent need for a comprehensive assessment of their knowledge, attitudes, and preventive practices related to cardiovascular health.

Methodology: The study was a cross-sectional study, focusing on undergraduate students at the University of Jos, Plateau State, involving a sample size of 386 drawn from a population of 34,234, achieved through simple random sampling techniques. Data was collected using an adapted structured questionnaire, entered, cleaned, and analyzed using Statistical Package for the Social Sciences (SPSS) version 22. Chi-square was used to test the hypothesis of the study and the degree of association of the variables. Descriptive statistics was used to generate frequency tables and the research hypotheses were set at a 5% margin of error.

Results: The mean score of 3.03 (SD = 1.415) related to regular health check-ups signals a need for improvement in preventive practices among these students. The overall results emphasize the critical

role of awareness in fostering early adoption of health-promoting behaviours that can significantly mitigate future CVD risk.

Conclusion: Using the Health Belief Model (HBM) as a framework, the study revealed significant insights. First, while students recognize the importance of health check-ups and physical activity, there are notable gaps in their understanding of CVD risk factors and symptoms, indicating a need for enhanced educational initiatives. Second, students display a generally proactive attitude towards cardiovascular disease prevention and adopting healthier lifestyles; however, their varying levels of concern regarding personal risk may impede their engagement in preventive behaviours. To address these gaps, the study recommends implementing comprehensive preventive strategies, including campus-wide health promotion programs. Establishing wellness centers offering nutrition counseling, fitness classes, smoking cessation support, and stress management workshops could further promote a culture of cardiovascular wellness on campus. Increasing knowledge about cardiovascular health is essential for cultivating healthier behaviors, leading to more active lifestyles and better long-term health outcomes.

Introduction

Non-communicable diseases (NCDs) have emerged as significant public health challenges, particularly in low- and middle-income countries (LMICs). According to the World Health Organization (WHO) in 2008, 80% of global NCD deaths occurred in LMICs, with NCDs accounting for 7.9 million of the 14.5 million deaths (54%) in Southeast Asia alone (WHO, 2011). By 2010, NCDs were responsible for two of every three deaths worldwide (34.5 million) (WHO, 2011). Key contributors to the rising burden of NCDs in LMICs include poverty, illiteracy, inadequate health infrastructure, and demographic transitions such as increasing life expectancy. Poor fetal and childhood nutrition further exacerbate this issue.

Globally, cardiovascular diseases (CVDs) account for one in four deaths, totaling 12.9 million fatalities (Lozano et al., 2012). Behavioural risk factors such as tobacco use, poor diet, physical inactivity, and harmful alcohol consumption contribute to 80% of CVD cases (Ezzati et al., 2004). Individuals with poor behavioural scores are four times more likely to face all-cause mortality compared to those with healthy behaviours. In high-income countries, declines in CVD mortality are largely attributed to reductions in these risk factors.

In South Asia, countries like Nepal illustrate this trend, where NCDs now surpass communicable diseases in prevalence, driven by high behavioural risk factors such as tobacco use (Godfrey et al., 2010). The WHO identifies seven NCDs among the top 10 global causes of death, with cardiovascular diseases (CVDs) leading the way. CVDs are responsible for an estimated 17.9 million deaths annually, predominantly occurring in low- and middle-income

countries (Godfrey et al., 2010). Sub-Saharan Africa (SSA) is undergoing an epidemiological transition, increasingly facing an epidemic of NCDs, including CVDs, which contribute significantly to morbidity, mortality, and economic loss (BeLue, 2009).

In Nigeria, the prevalence of risk factors such as hypertension, unhealthy diets, and alcohol consumption is alarmingly high (Guthold, 2018). The growing burden of CVD in SSA is expected to double by 2030, driven by population growth, aging, and lifestyle changes. To combat this rising threat, innovative behavioral change interventions are crucial to address these risk factors and improve cardiovascular health outcomes. A knowledgeable population is essential for effective interventions, as increased awareness leads to healthier lifestyle choices and better health-seeking behaviours (Mohd et al., 2017). Unfortunately, CVD remains a relatively new concern in SSA, resulting in limited public understanding of the disease and its risk factors. Despite the global recognition of CVD as a leading cause of preventable death, knowledge about its symptoms and risk factors remains inadequate in many regions, including Nigeria. Previous studies indicate low awareness of heart attack and diabetes symptoms in similar contexts, highlighting the urgent need for targeted educational initiatives (Upadhyay et al., 2008). Current data on cardiovascular health knowledge in Nigeria is sparse, with few studies focusing on the general population's understanding of CVD and its prevention. Understanding the social determinants of cardiovascular health is critical, as they significantly influence exposure and vulnerability to CVD risk factors. The WHO emphasizes the importance of public awareness regarding diet and physical activity as key strategies for improving cardiovascular health. However, achieving desired health behaviours requires a comprehensive understanding of the social context surrounding the disease. Knowledge, attitude, and practice (KAP) studies are vital for enhancing cardiovascular health literacy and informing community behaviours. Despite the pressing need for such studies, they remain limited in Nigeria. Existing literature primarily focuses on specific conditions or risk factors, leaving a gap in understanding the broader population's knowledge of CVD. This study aims to address this gap by examining knowledge of CVD prevention and associated factors among undergraduate students at the University of Jos. CVD is one of the most preventable causes of death globally, with many risk factors being modifiable. Increasing knowledge about CVD, its symptoms, and risk factors is essential for fostering healthier attitudes and behaviors. Improved recognition of heart attack and stroke symptoms can facilitate earlier medical intervention, ultimately leading to better patient outcomes.

Establishing a baseline understanding of CVD knowledge in the population is crucial for developing targeted educational programs.

The WHO advocates for awareness-raising initiatives to reduce morbidity and mortality associated with CVD. Compliance with preventive measures hinges on individuals' ability to evaluate their health risks accurately. This aligns with behavior change models, such as the health belief model and the theory of planned behavior, which highlight the importance of health literacy in promoting positive health behaviours (Awosika, 2012).

In Nigeria, socioeconomic factors and limited access to healthcare significantly hinder the effective management and prevention of cardiovascular diseases (CVDs). Many individuals, especially those in low-income communities, face barriers such as high out-of-pocket health expenses, which often lead to catastrophic financial consequences. This situation disproportionately affects vulnerable populations, forcing them to prioritize immediate needs over health, ultimately resulting in late presentations for medical care. Moreover, the lack of comprehensive health education exacerbates poor health-seeking behaviours. Many people are unaware that they may be living with conditions like hypertension or elevated cholesterol levels, which can lead to severe health complications if left unaddressed. The covert nature of CVDs means that individuals may remain asymptomatic until significant damage occurs, further complicating timely intervention efforts. To combat these challenges, there is a pressing need for targeted case-finding strategies and screening programs that can estimate the prevalence of hypertension and other risk factors in the population. Such initiatives should incorporate community engagement to increase awareness and promote preventive health behaviours. Given the high prevalence of modifiable risk factors for CVD in Nigeria, enhancing knowledge around these risks, improving public health literacy, and fostering community education can empower individuals to take proactive steps toward better health outcomes. This approach is essential in formulating effective public health strategies and interventions tailored specifically to the needs of the population, particularly among university students who are at a critical juncture in their health behaviours and choices.

This study seeks to address the existing knowledge gap surrounding CVD prevention among undergraduates and inform policies aiming to enhance cardiovascular health through education and community engagement initiatives.

This study aims to provide insights into cardiovascular health literacy among young adults in Nigeria, focusing on undergraduate students at the University of Jos. According to the World Health Organization (WHO), non-communicable diseases (NCDs), including cardiovascular

diseases (CVDs), are among the top causes of death globally, with 17.9 million fatalities each year, predominantly in low- and middle-income countries (WHO, 2011). The rising prevalence of CVDs in Sub-Saharan Africa underscores the urgent need for effective preventive measures and health education. Knowledge gaps contribute to low compliance with CVD treatment and prevention (Mohd et al., 2017; Jafary et al., 2025). Understanding the knowledge, attitudes, and practices (KAP) related to CVD in this population is essential for designing targeted educational programs. Ensuring that young adults have access to accurate, evidence-based information about CVD can empower them to make informed health decisions, recognize risk factors, and adopt healthier lifestyles. The findings will identify specific knowledge and practice gaps that can be addressed through tailored interventions, ultimately aiming to reduce the future burden of CVD in Nigeria. By focusing on undergraduate students, this study contributes to the broader goal of enhancing cardiovascular health education and promoting healthier behaviors among the younger generation—critical for long-term public health improvements. This study in nutshell, is significant as it seeks to bridge the knowledge gap regarding CVD among young adults, fostering a proactive approach to cardiovascular health that can lead to improved health outcomes and reduced CVD mortality rates in Nigeria.

Specific Objectives

i. To evaluate the level of knowledge about cardiovascular disease among undergraduate students at the University of Jos.

ii. To identify attitudes toward cardiovascular disease prevention among undergraduate students at the University of Jos.

iii. To assess the implementation of preventive measures against cardiovascular disease among undergraduate students at the University of Jos.

Materials and Method

Study Area: Plateau State is a state that is situated in the country's center. Known as the "Home of Peace and Tourism. University of Jos, one of the oldest universities in Nigeria, is one of many educational institutions in Plateau State.

The state capital, Jos, has three local governments, Jos-North, Jos-South, and Jos-East. Jos-North covers a total area of 291 km^2 with a projected population of 572,700. The University of Jos is one of many educational institutions in Plateau State. The three most common languages spoken by residents in this study area are Hausa, English and Berom. The university

has a diverse student body comprising various ethnic groups, socioeconomic backgrounds, and academic disciplines.

Study Design:

A cross-sectional survey research design was used, with the data collection using a structured questionnaire on a 5-point Likert scale. The choice of survey design provided a structured approach to data collection, allowing researchers to obtain information from multiple respondents quickly. This makes it easy to reach a wide audience and collect responses in a relatively short period. The survey collected data from diverse range of participants which makes generalizations easier and draw conclusions that can be applied to a broader context. The items were measured on five point Likert scales ranging from strongly disagree (1); disagree (2); undecided (3); agree (4) and strongly agree (5). The reason is to make the respondents choose the appropriate response base on their judgment.

Study Population Adults above 18 years that reside within Plateau State who consented to take part in the survey.

Inclusion criteria:

- Adults above 18 years who consented to take part in the survey

- Only undergraduate students of Unijos

Exclusion criteria:

- Adults who are too sick to participate

- Individuals that were not available at the time of the survey

- Postgraduate students of Unijos

Sample Size Determination

The minimum sample size was calculated from the population using the formula

$n = N/1+N(e)^2$

Where: n = Sample size, N = Population size, e = Margin of error

Sampling size (n) therefore, was calculated as n = 399

Sampling Technique

A simple random sampling technique with a replacement method was employed using the Undergraduate students at the University of Jos. The sampling technique adopted was a simple random sampling technique (Kumar, 2011). The choice of the simple random sampling technique aims to collect data in such a way that all elements in the population have an equal chance of being selected. A number was assigned to each individual or item in the population. The numbers were sequential and cover the entire population. A random number generator to

select random numbers was used. The range of random numbers corresponded to the total number of individuals or items in the population. The random numbers generated in the previous step to select the corresponding individuals or items from the population.

This process was repeated until the desired sample size. Make sure that each selection is independent of the previous selections and that every individual/item has an equal chance of being chosen.

Data Collection Techniques and Tools

The data for this study were obtained from a primary sources. The questionnaire was adapted from previous studies. The data was sourced from undergraduate University of Jos students, and they are representative of the population. Therefore, data for the study was sourced from primary source. The questionnaire contains closed ended questions divided into two sections. The first section contains the respondents' bio data, the second section is on issues on the problem under study. The items were measured on five point Likert scales ranging from strongly disagree (1); disagree (2); undecided (3); agree (4) and strongly agree (5).

Validity Tests

Test- retest (Reliability)

Having selected the study LGA, the survey instrument (questionnaire) was pre-tested in the University where questions found to be unclear or unnecessary were modified or deleted accordingly. Five professionals in the field of public health were used for the reliability test

Construct Validity

Validity test of instrument can generally be described as "the extent to which the research findings accurately reveal the phenomena under study" or "the extent to which what is set to be measured is accomplished" (Collis & Hussey, & Gregory as cited in Charity, 2011). Validity of instrument was achieved by the help of the supervisor's input, and two experienced academics in the department of Public Health in Ahmadu Bello University (ABU) Zaria, Nigeria. Reliability of the instrument was obtained through employing the Cronbach's Alpha coefficient measure the internal consistency of the instrument on the questionnaire administered to thirty (30) respondents for the pilot testing. Using SPSS version 22, the study possessed high reliability from 0.720 to 0.856

Management of variables

All completed questionnaires were checked for completeness and consistencies of variables. Dependents and independents variables were measured accordingly

Statistical Analysis

Data were entered, cleaned, and analyzed using Statistical Package for the Social Sciences (SPSS) version 22. Chi square was used to test for degree of association significant variables were set at 5% margin of error.

Ethical Considerations

Verbal consent was obtained from the participants. The purpose and importance of the study was explained to participants in the language they understand best before filling of the questionnaires. The respondents Consent forms were given to all respondents to sign, and they were given the opportunity to opt out of the study after explaining what is expected of them. No personal identifiers were used for data storage.

Results

Table 1: The rate of return of questionnaires by respondents

S/N	Study Area	Total Number of Questionnaires Administered	Total Number of Questionnaires Returned & Valid	Percentage of Questionnaire Returned & Used
1	Undergraduate Students of Uni Jos	399	386	97%

Source**:** Researcher's survey, 2023

Out of the 399 questionnaires administered, 386 were returned and deemed valid, resulting in a high return rate of 97%.

Table 2

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	269	69.7	69.7	69.7
	Female	117	30.3	30.3	100.0
	Total	386	100.0	100.0	

Source: SPSS Output, 2024

Out of the 386 valid responses, 269 were male, accounting for 69.7%, while 117 were female, representing 30.3%.

Table 3

Marital Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	342	88.6	88.6	88.6
	Married	44	11.4	11.4	100.0
	Total	386	100.0	100.0	

Source: SPSS Output, 2024

Out of the 386 valid responses, 342 respondents are single, accounting for 88.6%, while 44 respondents are married, making up 11.4%.

Table 4: Knowledge of Cardiovascular Disease among respondents

	N	Minimum	Maximum	Mean	Std. Deviation
I am aware of the major risk factors for cardiovascular diseases.	386	1	5	3.05	1.414
I understand the symptoms of cardiovascular diseases.	386	1	5	2.84	1.466
I know the importance of regular health check-ups in preventing cardiovascular diseases.	386	1	5	3.93	1.229
I am knowledgeable about the dietary recommendations for preventing cardiovascular diseases.	386	1	5	3.55	1.229
I understand the role of physical activity in reducing the risk of cardiovascular diseases.	386	1	5	3.89	1.149
Valid N (listwise)	386				

Source: SPSS Output, 2024

The responses, measured on a Likert scale from 1 (strongly disagree) to 5 (strongly agree), show that students have a moderate awareness of major risk factors (mean = 3.05, SD = 1.414)

and a low to moderate understanding of symptoms (mean = 2.84, SD = 1.466), with significant variability in these areas. The recognition of the importance of regular health check-ups is relatively high (mean = 3.93, SD = 1.229), suggesting strong agreement among students. Knowledge about dietary recommendations (mean = 3.55, SD = 1.229) and the role of physical activity (mean = 3.89, SD = 1.149) indicates a moderate to high level of understanding with some variability.

Table 5: Attitude of the respondents on Cardiovascular Disease

	N	Minimum	Maximum	Mean	Std. Deviation
I believe it is important to be proactive about preventing cardiovascular diseases.	386	2	5	4.24	.804
I feel concerned about the possibility of developing cardiovascular diseases.	386	1	5	3.16	1.239
I believe cardiovascular diseases can be effectively managed with proper medical care.	386	1	5	3.97	.927
I think lifestyle changes are necessary to prevent cardiovascular diseases.	386	1	5	4.10	.831
I am willing to adopt a healthier lifestyle to reduce my risk of cardiovascular diseases.	386	3	5	4.27	.592
Valid N (listwise)	386				

Source: SPSS Output, 2024

The responses, measured on a Likert scale from 1 (strongly disagree) to 5 (strongly agree), indicate generally positive attitudes. Students strongly believe in the importance of being proactive about prevention (mean = 4.24, SD = 0.804) and are willing to adopt a healthier lifestyle to reduce their risk (mean = 4.27, SD = 0.592). They also recognize the necessity of lifestyle changes to prevent cardiovascular diseases (mean = 4.10, SD = 0.831) and have confidence that cardiovascular diseases can be effectively managed with proper medical care

(mean = 3.97, SD = 0.927). However, there is moderate concern about the possibility of developing cardiovascular diseases (mean = 3.16, SD = 1.239), indicating variability in the level of concern among students.

Table 6: Practice Preventive Measures of Cardiovascular among the respondents

	N	Minimum	Maximum	Mean	Std. Deviation
I regularly engage in physical exercise to maintain heart health.	386	1	5	4.18	.713
I follow a heart-healthy diet that is low in saturated fats and cholesterol.	386	1	5	3.23	1.030
I avoid smoking and excessive alcohol consumption to reduce my cardiovascular risk.	386	1	5	2.79	1.019
I manage my stress levels through relaxation techniques or other methods.	386	1	5	2.51	1.052
I get regular health check-ups to monitor my cardiovascular health.	386	1	5	3.03	1.415
Valid N (listwise)	386				

Source: SPSS Output, 2024

Responses from 386 students, measured on a Likert scale ranging from 1 (never) to 5 (always). The findings reveal that students generally engage in physical exercise regularly to maintain heart health (mean = 4.18, SD = 0.713), indicating a positive practice in this aspect. However, there are areas where improvement is needed. While students demonstrate some adherence to heart-healthy diets (mean = 3.23, SD = 1.030), avoidance of smoking and excessive alcohol consumption (mean = 2.79, SD = 1.019), and regular health check-ups for monitoring cardiovascular health (mean = 3.03, SD = 1.415)

Discussion

The study has been able to ascertain the level of knowledge, attitude and practice of preventive measures on cardiovascular disease among undergraduate students at university of Jos the students at University of Jos, Nigeria

The present study shows that students have a moderate awareness of major risk factors (mean = 3.05, SD = 1.414) and a low to moderate understanding of symptoms (mean = 2.84, SD = 1.466), with significant variability in these areas.

Awareness of cardiovascular disease (CVD) is critically important, especially among students, as it fosters early adoption of preventive behaviors that can significantly reduce the risk of developing such conditions later in life. According to the World Health Organization (WHO), cardiovascular diseases are the leading cause of death globally, claiming an estimated 17.9 million lives each year (WHO, 2021). For students, who are at a formative stage of developing lifelong habits, understanding the risk factors and symptoms of CVD can lead to more informed lifestyle choices. Studies have shown that increased knowledge about cardiovascular health correlates with healthier behaviors, such as regular physical activity, balanced diets, and avoiding smoking and excessive alcohol consumption (Mozaffarian et al., 2016). Furthermore, awareness programs tailored to the youth can significantly improve their health literacy, leading to proactive health management and regular health check-ups, which are crucial for early detection and treatment of CVD (Pender et al., 2019). Therefore, enhancing CVD awareness among students not only promotes their immediate well-being but also establishes a foundation for long-term cardiovascular health. The second research question, which aims to ascertain the attitude of individuals on cardiovascular disease among undergraduate students at the University of Jos, Plateau State, reveals significant findings. Students strongly believe in the importance of being proactive about prevention (mean = 4.24, SD = 0.804) and are willing to adopt a healthier lifestyle to reduce their risk (mean = 4.27, SD = 0.592). This proactive attitude is essential, as research indicates that early adoption of preventive measures can significantly mitigate the risk of cardiovascular diseases (Mozaffarian et al., 2016). However, there is moderate concern about the possibility of developing cardiovascular diseases (mean = 3.16, SD = 1.239), suggesting variability in the level of concern among students. This variability might be influenced by different levels of health literacy and personal experiences with the disease, which are critical factors in shaping attitudes toward health risks (Pender et al., 2019). Promoting a comprehensive understanding of cardiovascular risks and effective prevention strategies is vital. According to the American Heart Association, fostering a strong preventive attitude and awareness among young adults can lead to substantial long-term health benefits and reduce the overall burden of cardiovascular diseases (American Heart Association, 2021). Therefore, educational

programs that emphasize the importance of prevention and address the varied concerns among students could enhance their proactive behaviors and overall cardiovascular health.

On the measures to practice preventive measures for cardiovascular disease. The findings reveal that students generally engage in physical exercise regularly to maintain heart health (mean = 4.18, SD = 0.713), indicating a positive practice in this aspect. This is supported by numerous studies that highlight the role of regular physical activity in reducing cardiovascular risk (Warburton et al., 2006). However, there are areas where improvement is needed. For instance, adherence to a heart-healthy diet is moderate (mean = 3.23, SD = 1.030), and the avoidance of smoking and excessive alcohol consumption is relatively low (mean = 2.79, SD = 1.019). Moreover, managing stress levels through relaxation techniques or other methods scored even lower (mean = 2.51, SD = 1.052), indicating significant gaps in this preventive practice. Regular health check-ups to monitor cardiovascular health also showed room for improvement (mean = 3.03, SD = 1.415). These findings underscore the importance of comprehensive health education programs that not only promote physical exercise but also emphasize the benefits of a balanced diet, avoidance of harmful substances, effective stress management, and regular medical check-ups. According to the American College of Cardiology, a multifaceted approach to cardiovascular health that includes these components is essential for effective prevention and long-term health outcomes (Lloyd-Jones et al., 2010). Addressing these gaps through targeted interventions could significantly enhance the overall cardiovascular health of students.

Conclusion

In conclusion, the study conducted among undergraduate students at the University of Jos, Plateau State, reveals important insights into their knowledge, attitudes, and practices regarding cardiovascular disease (CVD). The findings indicate that while students have a moderate level of awareness about major risk factors and a low to moderate understanding of CVD symptoms, their attitudes towards prevention are generally positive. They recognize the importance of being proactive and are willing to adopt healthier lifestyles. However, there is variability in their level of concern about developing CVD, influenced by different levels of health literacy and personal experiences. In terms of preventive practices, students regularly engage in physical exercise, but there are significant gaps in adherence to a heart-healthy diet, avoidance of harmful substances, stress management, and regular health check-ups. These insights underscore the need for enhanced health education programs to address these gaps and promote comprehensive cardiovascular health among students. The overall impact of

increased knowledge, positive attitudes, and improved preventive practices can contribute significantly to reducing the risk of CVD and fostering a healthier student population.

Recommendations

1. To enhance knowledge dissemination strategies towards fighting cardiovascular disease, the university management should develop targeted educational interventions to improve the level of knowledge about cardiovascular disease (CVD) among undergraduate students at the University of Jos. This can be achieved by implementing interactive workshops, seminars, and online modules specifically focused on key aspects of CVD, including risk factors, symptoms, and preventive measures

2. The institution can foster a culture of proactive health management and positive attitudes towards CVD prevention among undergraduate students. This can be achieved by Implementing awareness campaigns and campus events that highlight the importance of preventive measures such as regular physical activity, healthy eating habits, stress management, and avoidance of harmful substances.

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