



Epidemiology and Risk Factors of Cardiovascular Diseases Among Young Adults in Delta State, Nigeria: A narrative review.

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Abstract

Background: Cardiovascular diseases (CVDs) are a leading cause of morbidity and mortality globally, with increasing prevalence among young adults (aged 18- 34 years) in Nigeria. Delta State, a region in southern Nigeria, faces unique challenges in addressing CVDs. This increasing prevalence in young adults in Nigeria is a serious public health concern.

Aim: This study is aimed at reviewing the epidemiology and risk factors of cardiovascular diseases among young adults in Delta State, Nigeria.

Methods: A comprehensive search of existing literature on the subject matter, which was done in the period of January to May 2024. Search databases were mainly from Google but included others from PubMed, OurWorldInData, and WHO Library and Information Networks for Knowledge Database (WHOLIS).

Results: The results of this review were presented in map and charts. It presented a global, Sub-Saharan African (SSA), Nigerian and Delta State pictures of the prevalence of cardiovascular diseases. The Delta State breakdown of the prevalence of these risk factors among the study group were presented under the following headings, gender, geographic location and socioeconomic variables, as charts. Also presented in this result is the prevalence of clustering of CVDs risk factors among young adults in Delta State compared with other parts of Nigeria.

Conclusion and Recommendation: In conclusion, this review showcased the alarming prevalence of cardiovascular disease risk factors among young adults in Delta State, Nigeria. Primary preventive measures in Delta State should be improved to reduce the incidence of CVDs among young people of today and protect the future older population of tomorrow.

Keywords: Cardio-metabolic, lifestyle, risk factors, young adults, Nigeria, Delta State, epidemiology, prevalence.

1. Introduction

1.1 Overview

Cardiovascular diseases (CVDs) such as hypertension, ischaemic heart disease (IHD), heart failure, stroke, Rheumatic Heart Disease (RHD) etc, are a leading cause of morbidity and mortality globally, with increasing prevalence among young adults worldwide including Nigeria (WHO, 2021 June 11). According to the Global Burden Disease Study (2019), CVDs cases rose from 272 million to 523 million, mortality from 12.1 million to 18.6 million, and disability-adjusted life years (DALY) from 279.8 million to 393.1 million between 1990 and 2019 (Sun, et al, 2023).

The situation in Nigeria is shown in figure 1 below. The graph showed that all the indicators of CVDs in Nigeria was higher in females than males with the exception of prevalence of atrial fibrillation and atrial flutter which were noticed to be higher in males than in females. Also, the prevalence of premature CVDs mortality ranged between 10% to 12% (Sani et al, 2020).

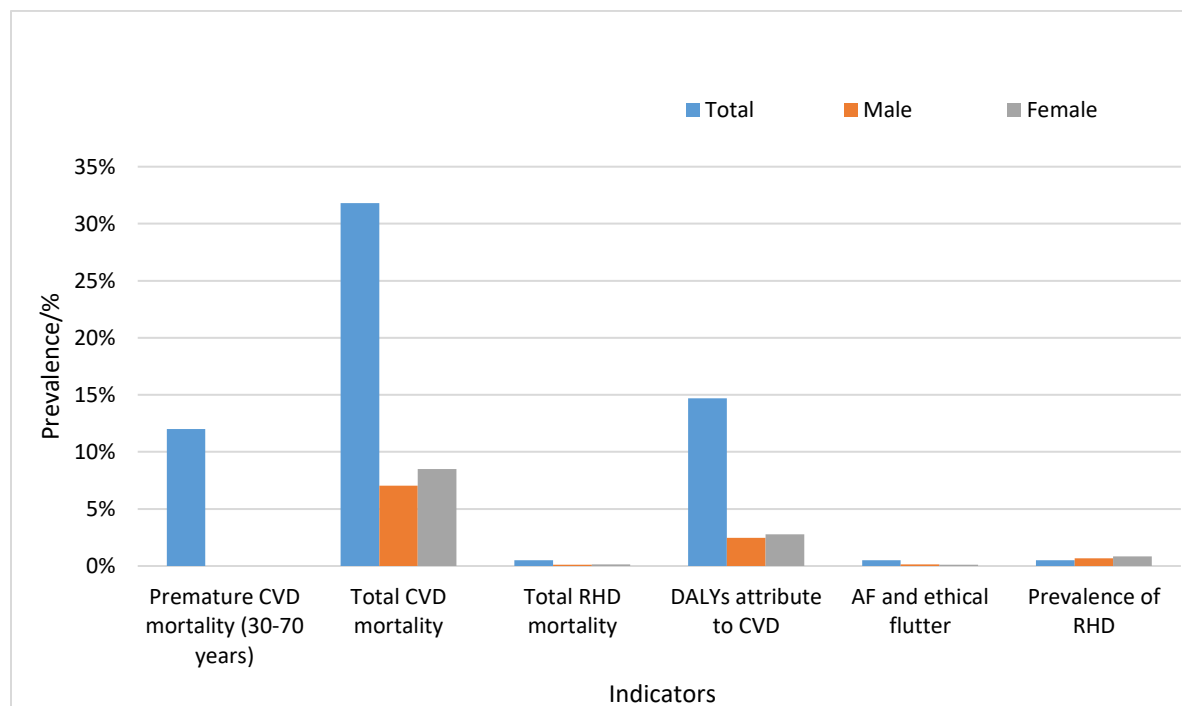


Fig 1: Prevalence of cardiovascular indicators in Nigeria (Sani et al, 2020)

Young adulthood (defined in Nigeria as persons' age 18-34 years) is a critical period for protecting health, not just during the transitional years but over the life course. Overall, the health, especially

cardiovascular health, of young adults have been found to be declining largely due to unhealthy behavior (including heart unhealthy behaviors, such as smoking, excessive consumption of alcohol/use of illicit drugs, physical inactivity and sedentary lifestyle). These unhealthy lifestyle behaviors have been found to be propagated and maintained by rapid globalization and urbanization (Nyangasa, et al, 2019, Oguoma et al, 2015).

The above listed lifestyle factors, together with hypertension, hyperlipidemia, obesity and type 2 diabetes (cardio-metabolic diseases/risk factors) are known as modifiable risk factors while others such as age, gender, ethnicity/race and family history (genetic make-up) are known as non-modifiable risk factors of CVDs (Hajar, 2017, Pencina et al, 2019). Improving the cardiovascular health of future adult generation depends on the prevention, control and management of these modifiable risk factors of CVDs among young adults through lifestyle modification and good health seeking behavior (Ghodeshwar, 2023).

1.2 Statement of the Problem

CVDs are of significant public health concern and responsible for high burden of morbidity. The world Health Organization (WHO) in 2016 revealed that in Nigeria, non-communicable diseases were estimated to account for 29% of all deaths, of which CVDs contributed 11% (WHO, 2016 June 11) and this changing trend noticed in Nigeria has been on for the past 20 years (Onyema & Ike, 2020). The increasing prevalence of CVDs among young adults is attributed to unhealthy lifestyles from adolescence to adulthood, which put them at a higher risk for cardio-metabolic diseases (Jing et al, 2021). If left uncontrolled, these behaviors can lead to early development of CVDs and premature death. Eighty percent of CVD cases are preventable, but the tools and knowledge to reduce harm to cardiovascular health are not being utilized in low and middle-income countries (this inequity is glaring and needs urgent attention) (Di Cesare et al, 2023). The growing CVDs epidemic has severe economic implications for Nigeria, with an estimated economic cost of over \$3.7 trillion between 2011 and 2015 (Oguoma et al, 2015). Young adults and middle-aged groups, who account for nearly half of all CVD patients, form a significant portion of the workforce that is driving the Nigerian economy, therefore, supporting their health, especially cardiovascular health, is crucial for nation building (Olamide et al, 2023).

Young adults is an important group who are within a vulnerable period and crucial window for future adult health determination (Jing et al, 2021). However, cardiovascular diseases epidemiology attributed to cardio-metabolic and lifestyle risk factors among young adults is not well represented in recent literatures especially in Nigeria (including Delta State). This study is therefore aimed at reviewing the epidemiology and risk factors of cardiovascular diseases among young adults in Delta State, Nigeria.

2. Objectives

This review will be examining the global prevalence of cardiovascular diseases, identifying and comparing the prevalence of CVDs risk factors among young adults in SSA, Nigeria, and Delta State. Also it will conduct a comprehensive review of the epidemiology of CVDs risk factors among young adults in Delta State. Furthermore, it will identify the prevalence and clustering of these risk factors among young adults both in Nigeria and Delta State. Lastly, the CVDs policies and interventions available in Nigeria will equally be analyzed.

3. Methodology

A narrative review research methodology was used with due cognizance of the scale for the quality assessment of narrative review articles (SANRA) (Baethge et al, 2019). The PRISMA-ScR method (Page et al., 2021), was used in a comprehensive search of existing literature on the subject matter, which was done in the period of January to May 2024. Search database was mainly from Google Scholars while others were from OurWorldinData and WHO Library and Information Networks for Knowledge Database (WHOLIS). The studies to be reviewed included those that focus on person age between 18 – 34 years, examine risk factors for CVDs, published between 2013 and 2024 (any latest available data) and in English. Studies that don't meet the above criteria were excluded from the review. Search terms “Prevalence of cardiovascular disease risk factors among young adults (ages 18 - 34 years) in delta state, Nigeria”. Critical appraisal of retrieved literatures was done using validated template for review of evidence-based practice (Arohaneui Hospice, 2017; Heart Views, 2017), and public health literatures (Heller et al., 2008).

4. Results

The literature search had 83 global articles, 72 of which covered SSA, 69 had only Nigerian articles while 39 had articles from Delta State, Nigeria (Fig 2). The articles were thereafter analyzed critically in a stepwise manner shown in figure 3.

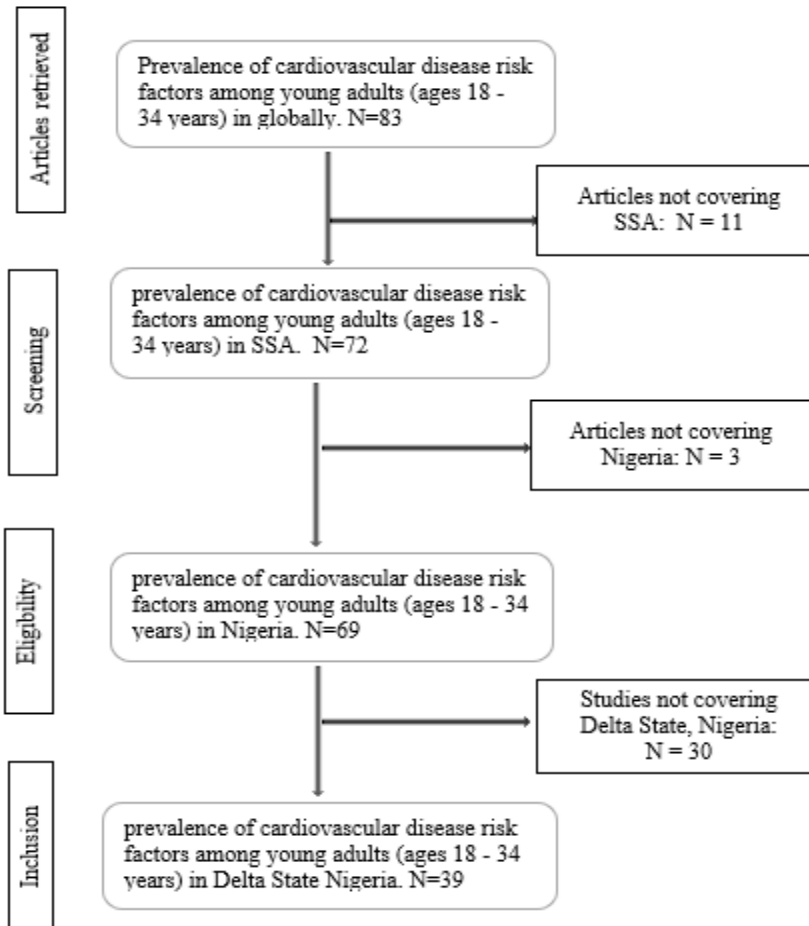


Fig 2: PRISMA-ScR flow-chart showing the search outcome.

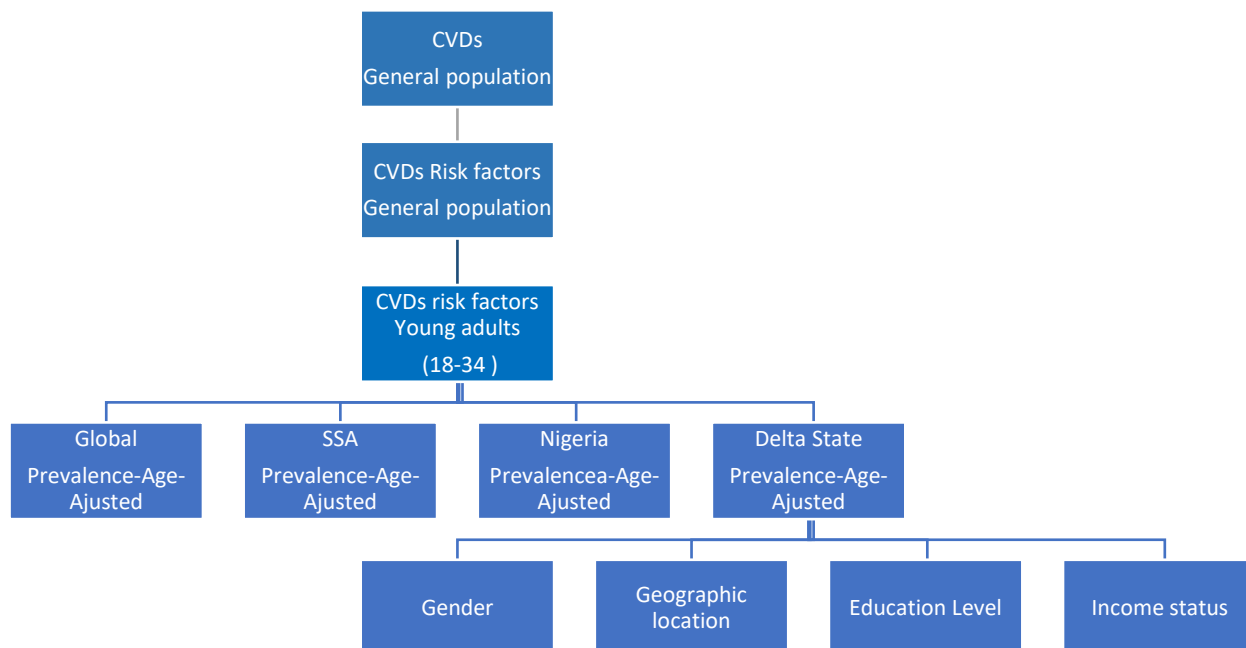


Fig 3: Showing the stepwise review of articles

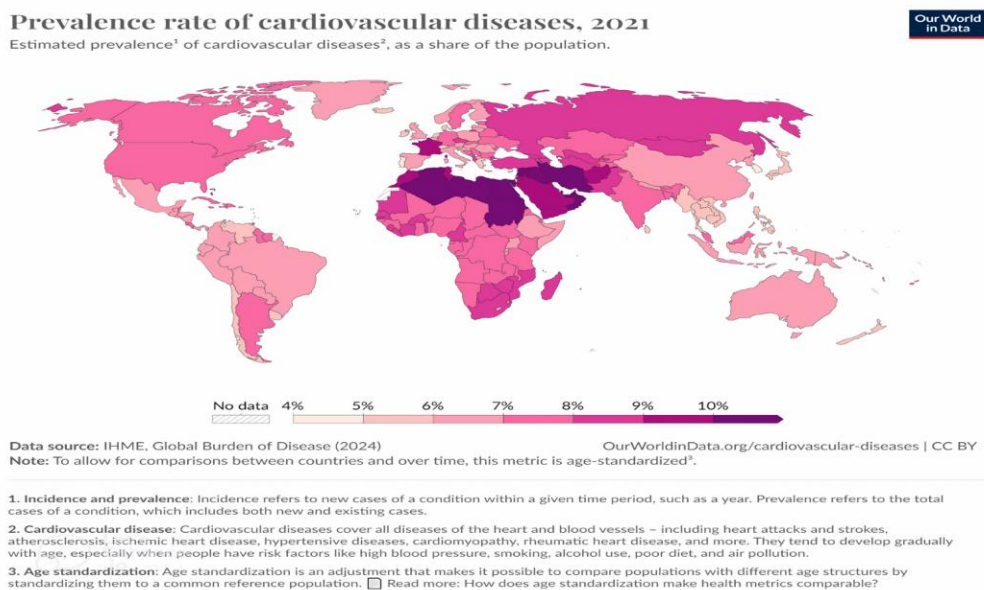


Fig 4: Prevalence of CVD Risk Factors – Global (Global Burden of Disease, 2024)

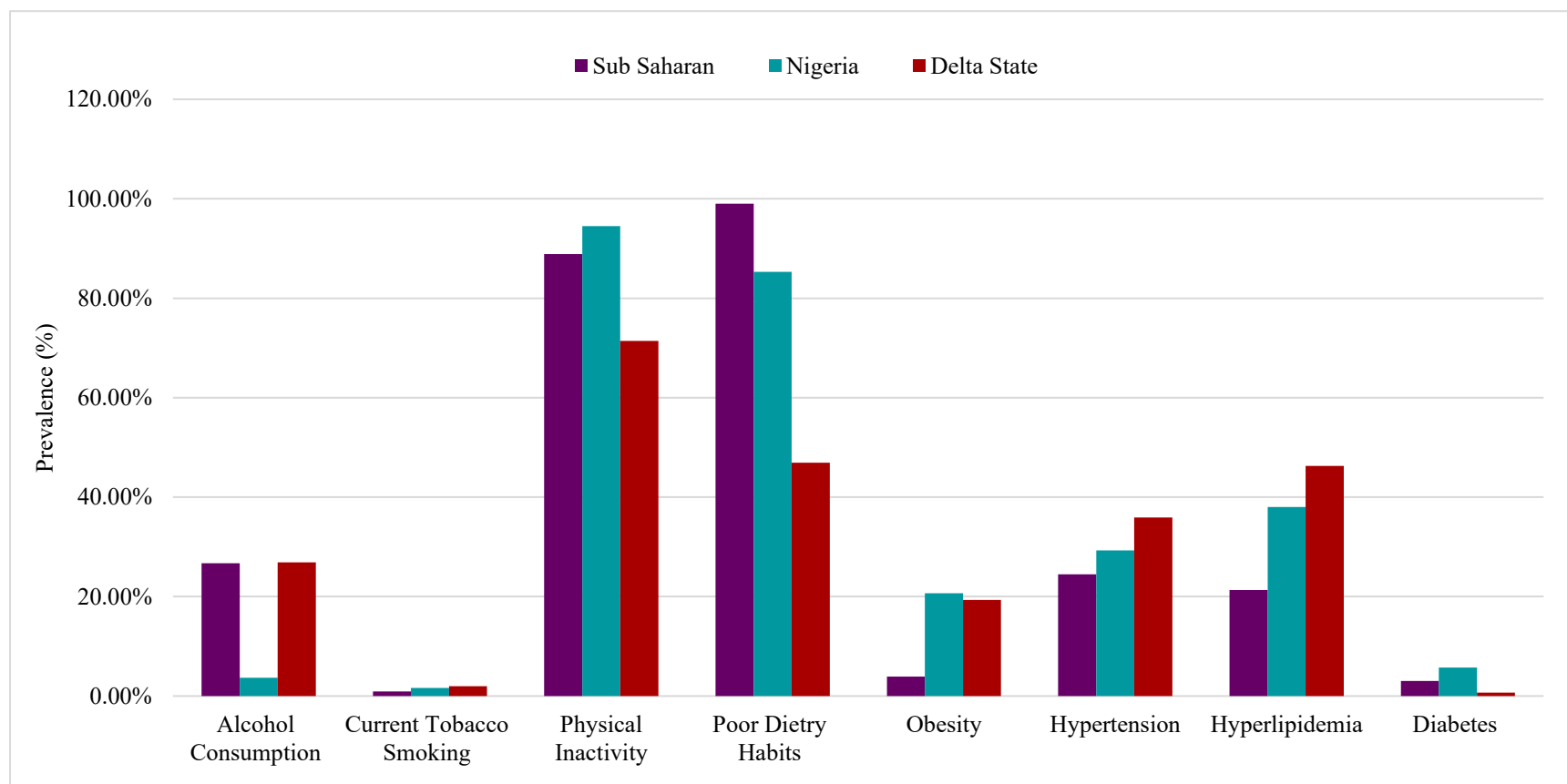


Fig 5: Prevalence of CVD risk factors among young adults in SSA, Nigeria and Delta State

Adeloye et al, 2019, Nansseu et al, 2019, Nyangasa et al, 2015, Oguoma et al, 2015, Olufayo et al, 2022, Uloko et al, 2018, Umuerri, 2020.

Table 1: Gender differences in cardio-metabolic risk in Delta State (Oguoma et al, 2015)

S/N	Cardio=metabolic risk factors	Male : Female ratio
1	Diabetes	3 : 1
2	Obesity (BMI)	1 : 2
3	Hypertension	1.2 : 1
4	Hyperglycemia	2 : 1
5	Hypercholesterolaemia	1 : 1.3
6	Obesity (WC)	2.8 : 1

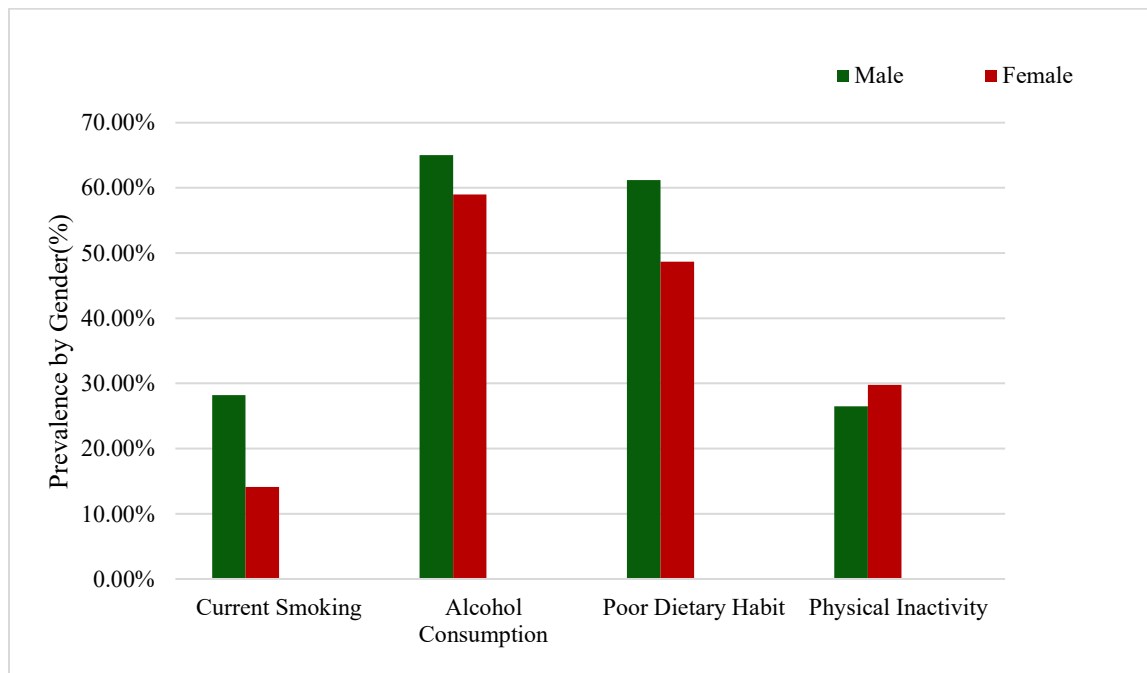


Fig 6: Gender differences in cardio-metabolic risk in Delta State (Umuerrri, 2019)

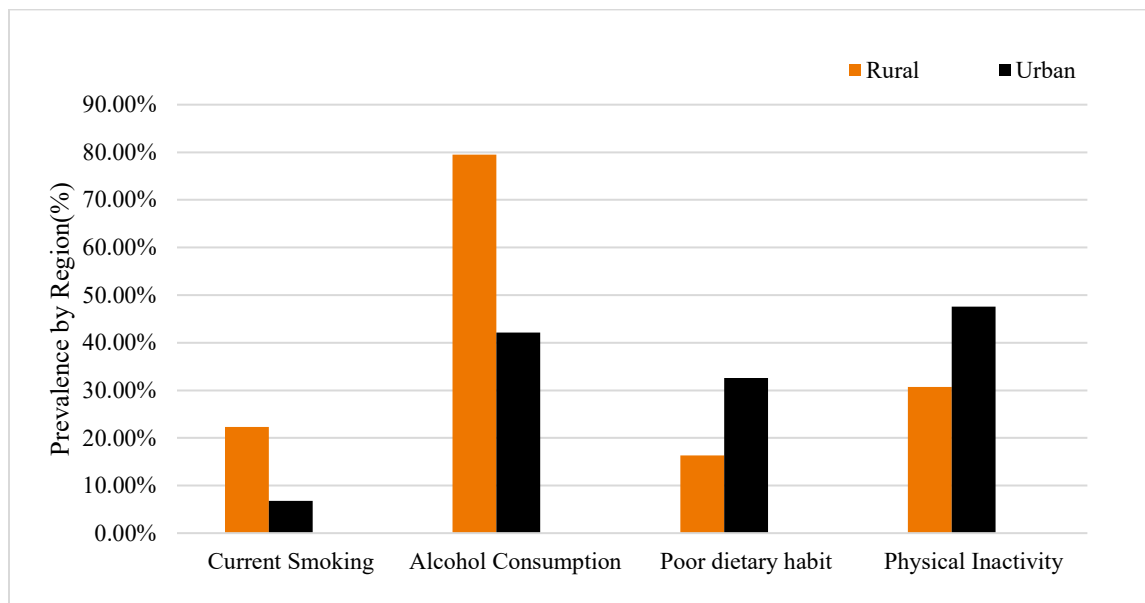


Fig 7: Prevalence of CVD lifestyle risks in Delta State, by geographic location (Umuerrri, 2019)

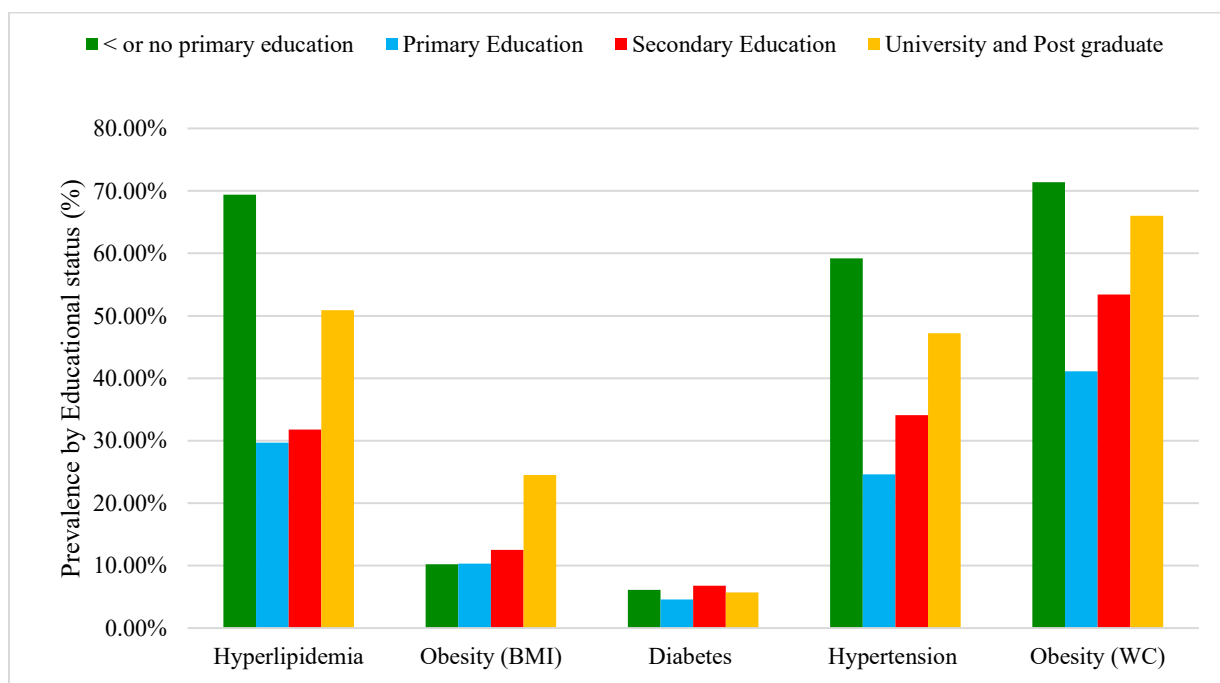


Fig 8: Prevalence of cardio-metabolic risk factors in Delta State, Nigeria (Oguoma et al, 2015)

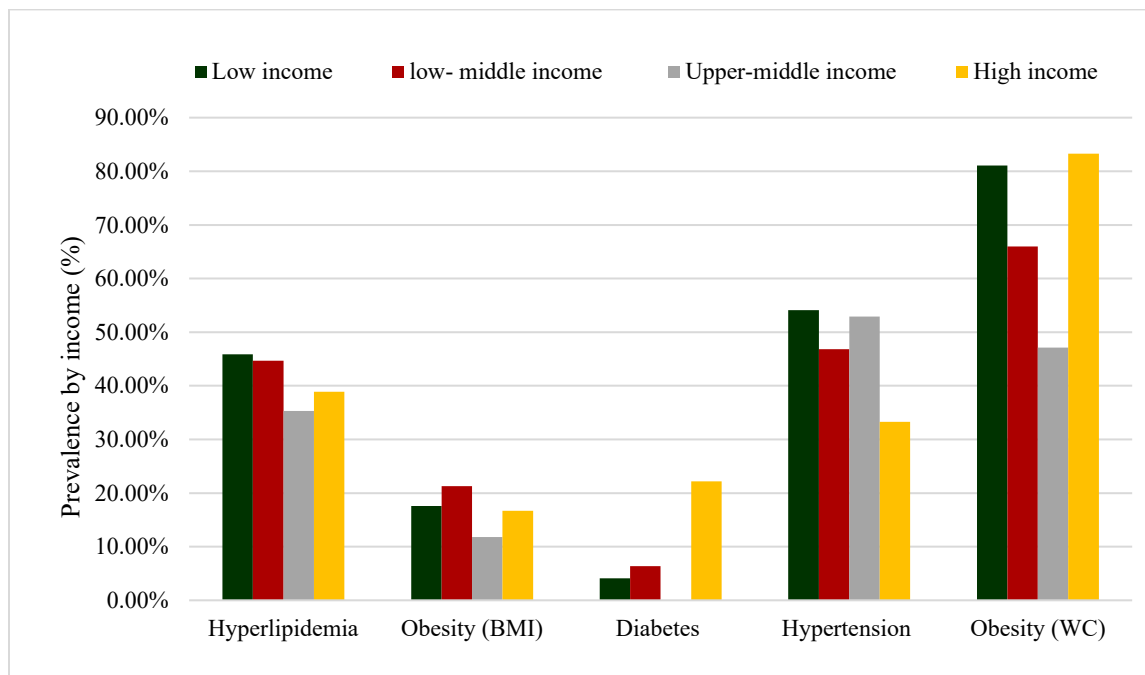


Fig 9: Prevalence of cardio-metabolic risk in Delta State, Nigeria – income (Oguoma et al, 2015)

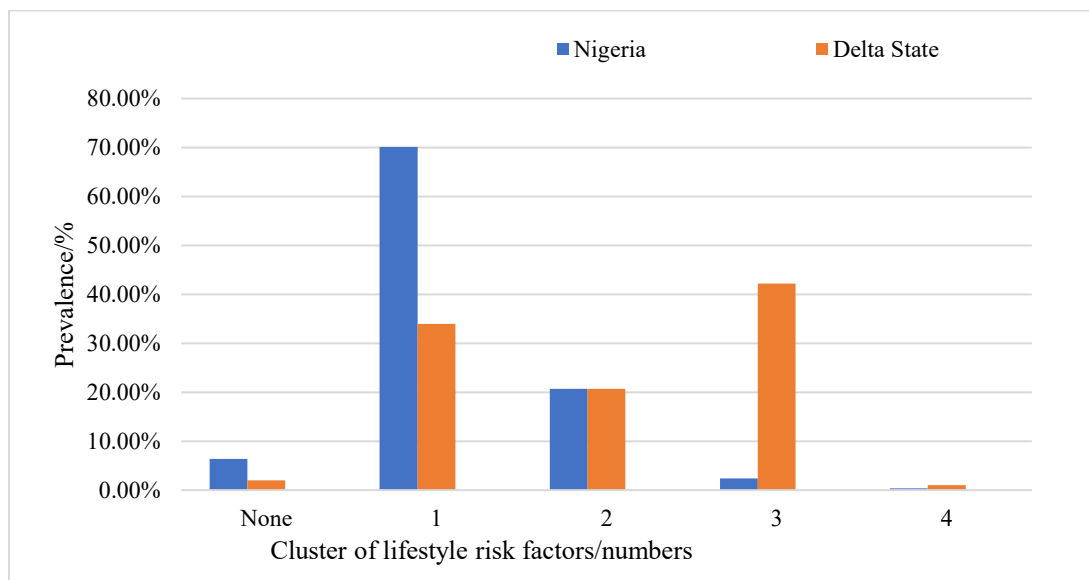


Fig 10: Clustering of lifestyle risk factors in Delta, Nigeria (Olufayo et al, 2022; Umuerrri, 2017)

Table 2: Public health policy timelines for CVDs risk intervention in Nigeria (Sani et al, 2020)

S/N	Policy	Year	Functions
1	National multi-sectorial action plan (NMSAP)	2019	Prevention and control of NCD, 2019 – 2025 with target and roadmap for implementation Also to address CVDs and the risk factors
2	National policy and strategic plan of 2013	2013	Address rheumatic heart disease – it control and prevention as a priority
3	National surveillance and monitoring system	2015	It has been implemented and include surveillance and monitoring of CVDs and their risk factors and other NCD
4	Tobacco control Act	2015	Banning, advertisement etc involving the use of tobacco products

5. Discussion

The results presented in this review contributed to reveal an alarming high prevalence of cardiovascular diseases risk factors among young adults both globally, in Nigeria and even in Delta State. The map from Our World in Data (Fig 4) shows the prevalence of CVDs across different countries and regions of the world. The North African countries together with those of the Middle East have some of the highest prevalence rate of CVDs in the world. This is because they tend to eat relatively plenty of carbohydrates, (in the form of figs, dates or refined sugars) and fats which is in keeping with their high level of obesity. Also physical inactivity in the form of sedentary lifestyle has been found to be common among most city dwellers in this environment (El-Kebbi et al, 2021). There are also some regional hotspots in Eastern European countries like Russia, Ukraine, and Kazakhstan amongst others.

One major gap causing this high prevalence across these Eastern European countries is the pronounced diverseness in healthcare systems (refusal to adopt newer public health policies and usage of old less effective medical treatment for CVDs), poorer socioeconomic conditions (many are still regarded as middle-income countries), and poor cultural practices (they are still engaged in unhealthy lifestyles) (Cenko et al, 2023). The lowest prevalence rate were noted around Asian-Pacific countries like Japan, Korea and Singapore are engaged in lifestyle practices, use of newer more effective medical treatment and better health seeking behaviours (Chan et al, 2018).

Most countries in Sub-Saharan Africa were shown to be disproportionately affected by CVDs, with some countries in South and West African regions having higher prevalence than others (OurWorldInData, 2024). The three most predominant causes of death from cardiovascular diseases in SSA are ischaemic heart diseases, hypertension, and stroke. Also, there are some CVDs such as endomyocardial fibrosis, rheumatic heart diseases as well as congenital heart disease that are endemic in SSA and are yet to be subdued. These together with globalization, rapid urbanization, lack of heart care infrastructure and workers in SSA have contributed to the high prevalence rates seen in SSA (Yuyun et al, 2020).

Particularly, this study as shown in table 1 revealed that in Delta State, Nigeria, the prevalence of hypertension and hyperlipidaemia (35.9% and 46.2% respectively) were found to be higher than what was obtained in SSA (24.5% and 21.3% respectively) and in Nigeria (29.3% and 38.0% respectively). However, physical inactivity and poor dietary habit (71.4% and 46.9% respectively) in Delta State were found to be lower than what was obtained in SSA (88.9% and 99.0% respectively) and in Nigeria (94.5% and 85.3% respectively) (Oguoam et al, 2015). These disturbing rates suggest a probable epidemic of cardiovascular diseases in future, especially within low- and middle- income countries like Nigeria. Therefore, there is an urgent need to emphasize on targeted interventions to tackle this epidemic.

An important area of the study is the significant gender differences noticed (Table 2). Females were found to be more obese and physically inactive when compared to males. The reasons for this may be due to weight increase during pregnancy and lactation and women engaging less in manual labor (Martin et al, 2020). However, the study equally showed that more young adult males were hypertensive, involved in excessive consumption of alcohol and smoking cigarette. These findings are in keeping with results reported in other geopolitical zones of the country (Mukhtal et al, 2021, Olufayo et al, 2022). Gender discrepancy as noticed in this review highlights the need of tailoring health education and intervention programs to address specific CVDs gender-related risks.

Further analysis of literatures of CVDs among young adults in Delta State revealed an urban-rural disparities (figure 4.6). Rural residents had higher prevalence rates in diabetes, hyperlipidaemia, tobacco smoking and excessive alcohol consumption when compared to their urban counterparts.

who were more obese, less physically active, and engaged more in poor dietary habits. This as previously observed, clearly show the effect of urbanization on our rural environment, and so in order to bridge these gaps policymakers should prioritize improving healthcare infrastructure and promoting healthy lifestyle choices in our rural areas (Oguoma et al, 2015; Umuerrri, 2019).

A significant factor emerging from this study is the socioeconomic gradient which observed that poor educational status was associated with higher prevalence in most of the cardio-metabolic risk factors except for obesity (by BMI). Income level also had its contribution to the socioeconomic gradient observed in this review because it shown that those with higher income were found to be associated with lower prevalence of hypertension, hyper-lipidaemia and obesity (by BMI) (figure 4.8). This observation may just show the ease of affordability of healthcare among those with higher income, since healthcare financing in Nigeria is mostly out-of-pocket (Madu & Osborne, 2023). The above findings underscore the critical role of socioeconomic determinants in shaping cardiovascular health. Education and income levels can influence access to healthcare services, healthy food options, importance and opportunity for physical activity. Therefore, addressing socioeconomic disparities is crucial in reducing cardiovascular risk factors.

Figure 5 shows the prevalence of clustering of cardiovascular risk factors among young adults in both Delta State and Nigeria. In Delta State, South-Southern, Nigeria it was found that the prevalence of having one risk factor was 98%, similar to what was obtained in Maiduguri, North-Eastern Nigeria (92%) (Mukhtal et al, 2021) but was lower than the finding in Ibadan, South-Western, Nigeria (70.1%) (Olufayo et al, 2022). This observation clearly shows that our young adults are becoming more involved with unfavorable lifestyle behaviors and are already developing cardio-metabolic diseases which predispose them to early development of cardiovascular diseases and premature deaths.

The policies listed in table 1 upon their assessment a few years later led to the implementation of other Acts and policies. One of such Acts is the Act (of 2003) establishing the National Health Insurance bill in 2019. The bill which operates at the national and some state level (such as contributory health scheme in Delta State), main purpose is to provide for health financing and making essential medicine for CVDs available at an affordable prices. Tobacco control policy had equally led to laws banning the smoking of tobacco in public places, labelling tobacco has been

dangerous on every pack of cigarette sold, advertisement, promotion and sponsorship of tobacco products are discouraged, and this policy on tobacco product should be protected from any form of interference. There has been an implementation of increment in excise taxes on tobacco and alcohol to 20.6% and 60% respectively. Also taxes on many unhealthy foods were instituted in 2018. There also been implementation of policy intervention on CVDs risk factors such as promotion of healthy diet to reduce CVDs risk and encouraging physical activity (Sani et al, 2020).

Public health implication of the review

Young adulthood is a critical developmental period when individuals face significant challenges and are expected to assume new responsibilities and obligations. It is also a period for protecting health, not just during the transitional years but over the life course. However, the heart-health of young adults, even in Delta State, Nigeria, have been found to be declining mostly due to unhealthy behavior which they engage in (Umuerrri, 2019). The implication of this high level of health in young adulthood may affect their future health status leading to early development of CVDs and possibly premature death. Young adult have been found to be resilient, adaptable and may make remarkable accomplishments (including educational attainment), showing an extraordinary capacity or creative insight and innovation however, with the development of CVDs early in life, all these achievements may not be possible. Young adults together with the middle-aged group make up a large proportion of the workforce of the nation so, supporting their health will be an immense economic benefit to the nation.

6. Conclusion and recommendation

6.1: In conclusion, this review showcased the alarming prevalence of cardiovascular disease risk factors among young adults in Delta State, Nigeria. The results emphasize the need for urgent interventions, tailored health education programs, and addressing socioeconomic disparities.

6.2: The study's finding have important implication for public health policy and practice. Top on the list is an immediate need for targeted interventions to address modifiable risk factors, such as physical inactivity and unhealthy diet. Thereafter, increasing awareness and education campaigns can promote healthy lifestyle choices. It is important to improve access to healthcare services, especially in rural areas, and also policymakers should prioritize the addressing of socioeconomic determinants of health. Lastly, more research is necessary to inform evidence-based policies and



programs particularly longitudinal studies to examine the impact of risk factors on CVDs outcomes and investigation into environmental factors influencing cardiovascular health.

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