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Assessing the relationship between waist circumference and cardiovascular diseases risk factors among young people in North Senatorial District of Delta State Nigeria: Mixed-method study protocol

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Abstract

The study aims to investigate the relationship between waist circumference and cardiovascular diseases risk factors among young people in Delta North Senatorial District of Nigeria. The mixed-methods study design includes cross-sectional descriptive observational hospital-based setting, as well as qualitative and quantitative data evaluations. The findings will provide empirical evidence to consider the use of reliable and validated data collection methods in clinical practice at Delta State health services. It would also identify potential gaps that may need to be worked on in the future by other researchers.

Introduction

1 **Background**

Cardiovascular diseases (CVDs) and diabetes mellitus (DM) are the leading causes of Non- Communicable Diseases (NCDs) worldwide, which has been a public health concern for several decades (World Health Organization, 1994, 2011, 2021). These two conditions have very similar predisposing factors, aetio-patho-physiology, presentations, and complications. And for these reasons, especially when they occur together, are generally referred to as cardio-metabolic disease. CVDs are on the increase worldwide and these increase are driven by forces that include rapid urbanization, globalization of heart unhealthy lifestyles such as unhealthy diet, reduced physical activity, increase. alcohol intake and increased cigarette smoking (known as lifestyle/behavioural risk factors of cardiovascular diseases), which are mostly imbibe during childhood/adolescence, and aging (World Health Organization, 2012, 2017).

Statement of the Problem

A study done among young Nigerians in Oghara Delta State showed that almost all the respondents (98.0%) had at least one lifestyle-related cardiovascular risk factor, and more than 40% had a cluster of three lifestyle-related risk factors (Umuerrri 2019). In terms of clustering of CVD risk factors, a recent study done in Kano North-west Nigeria, among young people between 17-31years showed that 90% of their participants had at least one CVD risk factor and 65% had at least one abnormal lipid parameter (Mukhttar, 2021).

General Objective

This study is aimed to investigate the relationship between waist circumference and other cardiovascular diseases risk factors among young people in South Southern Nigeria using both qualitative and quantitative approach. The specific research questions are:

1. What is the level of prevalence of cardio-metabolic risk factors among young people attending GOPD at General hospitals in the North Senatorial District of Delta State?
2. How clustered are the behavioural/lifestyle risk and cardio-metabolic diseases within the demographic variables and social risk factors?
3. Does the presence of behavioural/lifestyle risk affect level of knowledge, attitude and perception of cardio-metabolic risk among young adults in Delta State.
4. Are there any significant association between behavioural/lifestyle, social and cardio-metabolic risk factors among young people in Delta State?
5. Are there any significant association between obesity indices among young adults in Delta State?
6. Within the obesity indices, is there a significant association between these obesity indices, especially between waist circumference and the other obesity indices among young adults in Delta State?

Methods

2 Study design:

This was designed to be a cross-sectional, descriptive, and observational hospital-based study. Statistic design is mixed methods involving a variety of quantitative analysis approaches for the different specific objectives (table 1).

Objective	Hypothesis	Research Design	Proposal Statistics
To estimate the prevalence of <u>cardio-metabolic risk factor</u>	Cardio-metabolic risk factors is more prevalence among young adults in Delta North Senatorial District of Delta State	Cross-sectional	Descriptive frequencies
To assess the prevalence of clustering of behavioral/ <u>lifestyle risk factors</u> and cardio-metabolic <u>diseases</u> within the demographic variables and social risk factors	Cardiovascular risk factors clustered more among young adults with good socio-demographic index	Cross-sectional	Comparative analysis
To assess for knowledge attitude and perception of cardio metabolic dx among young adults with unhealthy lifestyle	Presence of unhealthy lifestyle increases the knowledge and perception of cardio metabolic diseases	Cross-sectional	Correlation or Logistic regression
To assess for association between behavioral risk factors, social risk factors and cardio metabolic diseases	There is a significant association between behavior/ lifestyle risk factors and cardio metabolic diseases	Cohort	Correlation and multivariate analysis
To demonstrate for association between obesity indices (BMI, WC, HC & TBF).	There is a significant association between obesity indices (WC, BMI, HC, %TBF).	Cross-sectional	Correlation analysis
To demonstrate for association between waist circumference and other cardio metabolic risk factors	There is a significant association between waist circumference, and other cardio metabolic risk factors	Cross-sectional	Correlation analysis

Table 1: Specific objectives match research designs

Study area or setting:

Administratively there are three senatorial districts in Delta State, Delta North, Delta Central and Delta South. The Delta North Senatorial District (DNSD), covers 9 local governments namely Aniocha North, Aniocha South, Ika North East, Ika South, Ndokwa East, Ndokwa West, Oshimili South, Oshimili North and Ukwani. Each of the local government area headquarter has a state secondary health facility located in the State. Therefore, each of these facilities will be used for our study.

Participants and selection criteria:

The participants were drawn from among young people (18yrs – 35yrs) living in the North Senatorial District of Delta State. Sample size determination was calculated using the Cochran formula for descriptive Study (Jaykaran 2013). Based on a confidence level of 95% and level of precision of 5% (0.05), the proportion of youth in a study done in DNSD and a nonresponse rate of 20% in a previous study (Oguoma 2015), the total of 450 respondents divided among 9 secondary facilities was determined, which came down to 50 respondents per facility.

Selection criteria

Study participants were proposed to be limited to young adults. Pregnant women are designed to be discretionally excluded during the recruitment process. Further considerations were those who had resided in DNSD for at least 1 year.

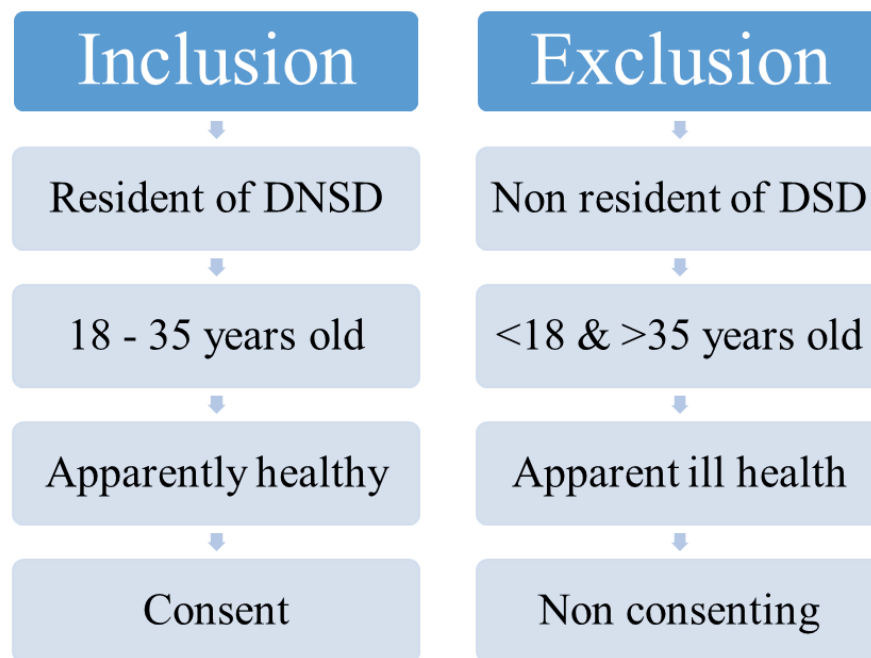


Fig 1: Selection criteria

The protocol

3 Sampling method:

The sampling design will follow the random and systematic approaches involving two steps. The sample size of 450 with the first respondent selected via a simple random sampling (balloting) method between the first four visitors who present at the General Outpatient Department (GOPD). Afterwards every fifth patient will be selected until the sample size for each facility (50) is met (Fig 2).

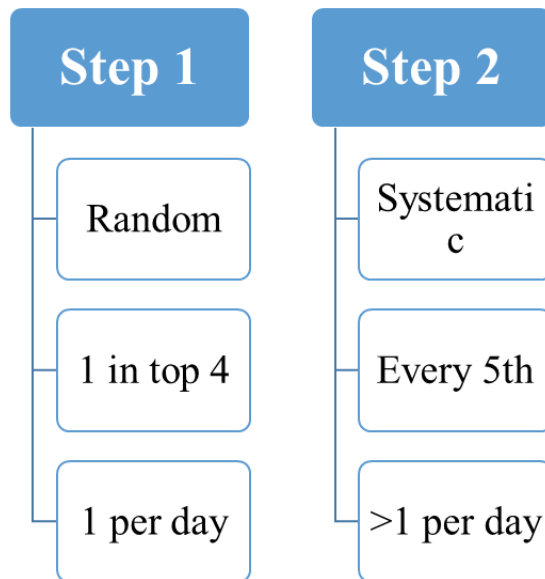
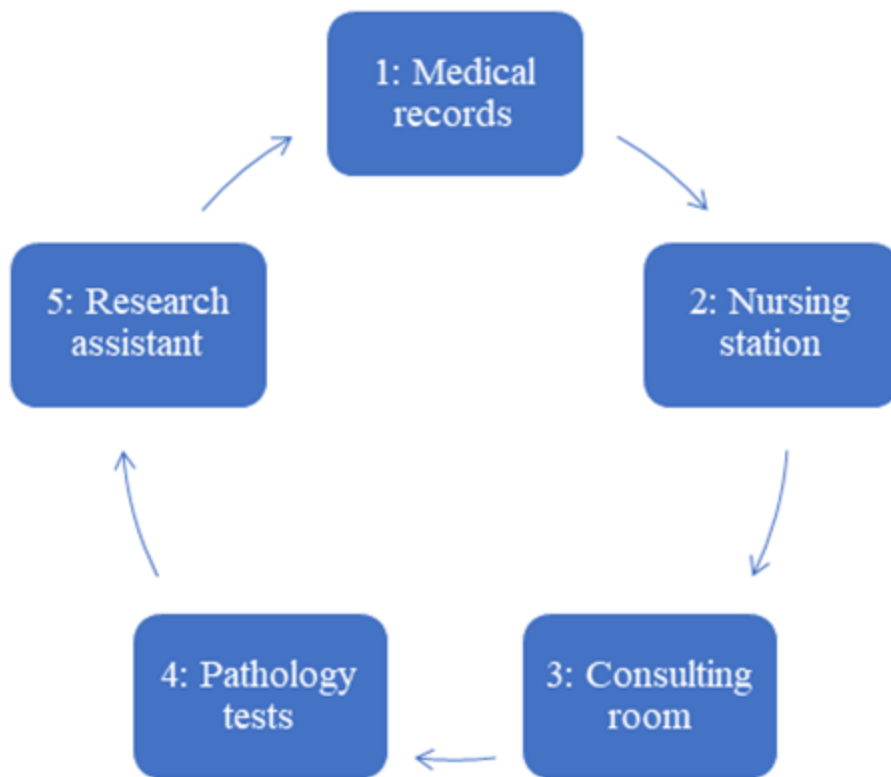


Fig 2: Summary of recruitment process

Data collection

The main tool for this project is questionnaire that has been adopted from the WHO STEPS manual (World Health Organization, 2017, 2024). This tool is commonly used for observational studies. (Babaee et al., 2020; Bell Ngan et al., 2020; Oguoma et al., 2018). Also, the knowledge, attitude and practice section of the questionnaire has been adopted from the cardiovascular diseases risk factors knowledge, attitude, and practice-29 (Koochi et al, 2021). The data collections were set to occur in five stages (Fig 3). The questionnaire at the end will contain sections for social risk factors (socio-demography), behavioural/lifestyle measures, knowledge, attitude and perception of cardiovascular diseases risk factors, physical measurements, and biochemical measurements of participants (Fig 4).



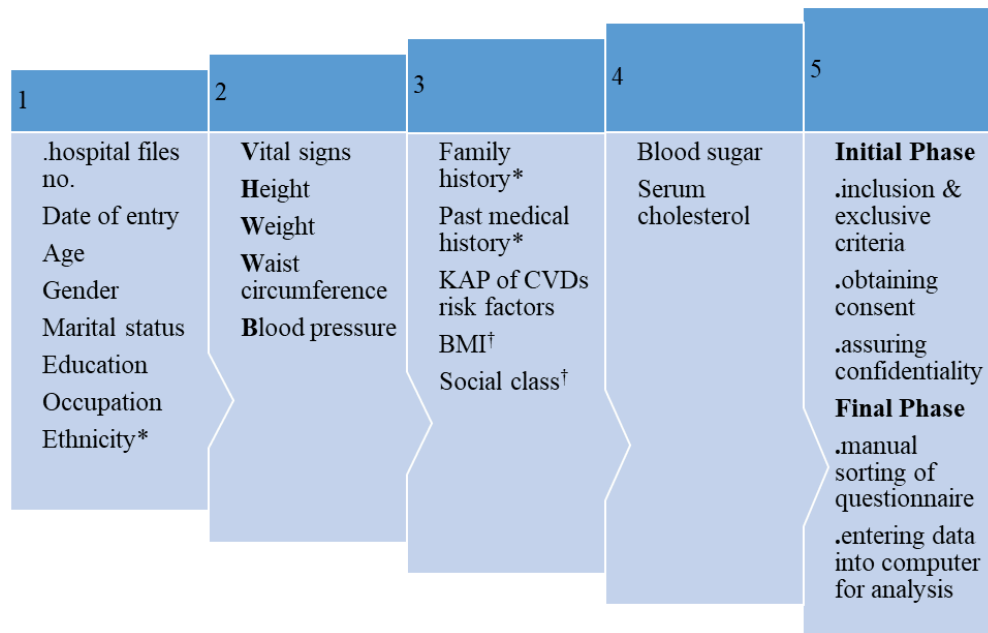


Fig 4: Details of data collection procedure: Dynamic flow chart

*Data for qualitative analysis, †dependent variables

Statistical Analysis:

The data will be analysed along the following research questions and hypothesis (see table 1). The questionnaires will be manually sorted out, entered into a computer and the obtained data will be analyzed using IBM SPSS version 20. Descriptive analysis of all the variables measured will first be done, and the categorical variables will be reported as frequencies and proportions/percentages, while the continuous variables will be reported as means $\pm$ standard deviation. Correlation analysis will be used to demonstrate association between waist circumference and other cardiovascular risk factors.

Validity and reliability:

The data collection tool was an adoption of the standard reliable and validated resource from the World Health Organisation, which has been in use for quite some time (World Health Organization, 2017, 2024)

Study limitations - SWOT summary

4 Strengths:

The sampling strategy used probability sampling method to ensure a good representative sample of the population. The questionnaire adapted is relatively cheaper. It is suitable for large representative population which can easily be collected, and widely used for epidemiology studies globally. The use of both quantitative and qualitative methods (mixed-methods approach) provides a comprehensive understanding of the research process. This study had a response rate of over 95% which increase the reliability of the findings. The accuracy of the

measured variable was high because most of the tools used were standardized and validated.

Weaknesses (limitations):

Being a cross-sectional study with lack of control group makes it difficult to establish causality. There were no measures to control confounding variables and this therefore, may have influenced the findings. Errors in collecting and computing data may total not be ruled out in a study and this may have compromise the accuracy of the findings.

Opportunities:

Almost ninety-five percent (95%) of the instruments used for measurements in this methodology were standard and validated. Ranging from the instruments used for the anthropometric measurements, laboratory measurements and the qualitative measures of physical activity, quality of diet, cigarette smoking and alcohol intake were all validated with good reliability scores. The study's findings may inform a policy decision where instruments used in methodology for studies should be standard and validated.

Threats (further limitations):

The cross-sectional design of the study will limit the ability of the study to provide causal inference. Limited financial resources made the study hospital base. The fact that the study is hospital-based may also affect the results of the study since it may not be a true representation of the entire population. Relying on self-reported data may introduce biases and inaccuracy. And the use of small sample size may not be a representative of the population.

Ethical compliance

5 Ethical clearance:

Approval for the research will be sought from the Research and Ethics committee of the Delta State Ministry of Health, Delta State Hospital Management Board and Novena University Ogume, Delta State.

Consent and confidentiality:

Informed consent will be obtained from each participant and confidentiality will be maintained at each stage in accordance with clinical principle for the guidance of physicians in medical research as stipulated in the Helsinki Declaration of 1964 as reviewed in the sixth edition of 2008 (Williams, 2008).

Conclusion

6 Significance of the Study

Given that cardio-metabolic diseases are largely preventable and lifestyle behaviours are theoretically modifiable, devising effective and targeted interventions to introduce, maintain healthy lifestyle modifications and improve cardio-metabolic health in young people would deliver long-term health benefits for the future generation (Shi, 2011).

Screening for these CVD risk factors at the general outpatients department (GOPD) is cumbersome and expensive.

Findings from this study will show how/if waist circumference alone could effectively be used as a predictor of other CVD risk factors i.e. among the young adults of DNSD, especially if it correlates well with the other traditional risk factors. So, if the hypothesis of this study is therefore found to be true then, it will be easier and cheaper to screen routinely for cardio-metabolic risk factors especially at GOPD or primary care settings using measurement of waist circumference alone. Findings will demonstrate the importance of using reliable and validated questionnaire such as the WHO STEPS questionnaire.

References

- 7 Babaee, E., Tehrani-Banihashem, A., Eshrati, B., Purabdollah, M., & Nojomi, M. (2020). How much hypertension is attributed to overweight, obesity, and hyperglycemia using adjusted population attributable risk in adults? *Int J Hypertens*, 2020, 4273456. <https://doi.org/10.1155/2020/4273456>
- Bell Ngan, W., Essama Eno Belinga, L., Essam Nlo'o, A. S. P., Roche, F., Goethals, L., Mandengue, S. H., & Bongue, B. (2020). Surveillance of cardiovascular Risk factors in the Fifth Military Sector Health center, Ngaoundéré, Cameroon: observational study. *JMIR Form Res*, 4(11), e18567. <https://doi.org/10.2196/18567>
- Charan, J., & Biswas, T. (2013). How to calculate sample size for different study designs in medical research? *Indian J Psychol Med*, 35(2), 121-126. <https://doi.org/10.4103/0253-7176.116232>
- Koohi, F., Amiri, P., Mehrabi, Y., Karimi, M., & Khalili, D. (2021). Development and validation of a knowledge, attitude, and practice questionnaire regarding cardiovascular diseases in an Iranian general population. *BMC Public Health*, 21(1), 2050. <https://doi.org/10.1186/s12889-021-12135-3>
- Mukhtar, I. G., Abdullahi, A. T., Muhammad, S. M., Sabiu, N. H., & Salisu, A. I. (2022). Prevalence of modifiable cardiovascular risk factors among undergraduate students in Kano Nigeria: A need for action. *J Taibah Univ Med Sci*, 17(4), 578-586. <https://doi.org/10.1016/j.jtumed.2021.10.013>
- Oguoma, V. M., Nwose, E. U., Skinner, T. C., Richards, R. S., & Bwititi, P. T. (2018). Diet and lifestyle habits: Association with cardiovascular disease indices in a Nigerian sub-population. *Diabetes Metab Syndr*, 12(5), 653-659. <https://doi.org/https://doi.org/10.1016/j.dsx.2018.04.007>
- Shi, S., Huang, H., Huang, Y., Zhong, V. W., & Feng, N. (2023). Lifestyle behaviors and cardiometabolic diseases by race and ethnicity and social risk factors among US young adults, 2011 to 2018. *J Am Heart Assoc*, 12(17), e028926. <https://doi.org/10.1161/jaha.122.028926>
- Umuerri, E. M. (2019). Heart disease: Lifestyle, knowledge, and perception among young Nigerian adults. *Int J Cardiovasc Acad*, 5(4), 134-140. https://doi.org/10.4103/IJCA.IJCA_28_19

- Williams, J. R. (2008). The Declaration of Helsinki and public health. *Bull World Health Organ*, 86(8), 650–652. <https://doi.org/10.2471/blt.08.050955>
- World Health Organization. (1994). *Cardiovascular disease risk factors; new areas for research*. Retrieved 2nd Feb, 2018 from http://apps.who.int/iris/bitstream/10665/37644/1/WHO_TRS_841.pdf
- World Health Organization. (2011). *Global atlas on cardiovascular disease prevention and control*. Retrieved 9th Jul 2014 from <https://www.who.int/publications/i/item/9789241564373>
- World Health Organization. (2012). *Noncommunicable diseases country profiles 2011*. Retrieved 27th June, 2017 from <https://www.who.int/publications/i/item/9789241502283>
- World Health Organization. (2017). The WHO STEPwise instrument for noncommunicable disease risk factor surveillance. In *WHO STEPS Surveillance Manual*. World Health Organization. https://cdn.who.int/media/docs/default-source/ncds/ncd-surveillance/steps/steps-manual.pdf?sfvrsn=c281673d_10
- World Health Organization. (2021). *Cardiovascular diseases (CVDs)*. Retrieved 28th Dec 2024 from [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)#:~:text=Cessation%20of%20tobacco%20use%2C%20reduction,adopt%20and%20sustain%20healthy%20behaviours](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)#:~:text=Cessation%20of%20tobacco%20use%2C%20reduction,adopt%20and%20sustain%20healthy%20behaviours).
- World Health Organization. (2024). The WHO STEPwise instrument for noncommunicable disease risk factor surveillance. In *WHO STEPS Surveillance Manual*. World Health Organization. https://cdn.who.int/media/docs/default-source/ncds/ncd-surveillance/q-by-q_steps_instrument_v3.2.docx?sfvrsn=63b7a628_1&download=true