Review Comments:

The paper by Noor et al. describes the results of a community based cross-sectional study that

assessed the prevalence of hypertension among overweight and obese adults in two cities of River Nile State of Norther Sudan. The rationale proposed by the authors for the study was that:

weight reduction is important for the control of hypertension. To assess prevalence, authors conducted a survey and took anthropometric measurements of adults in two cities. Prevalence of

hypertension in the study sample was 79.3% while central obesity among hypertensive respondents was 92.6%.

The paper can potentially be an important addition to the literature on surveillance to prevent health risk factors among vulnerable population sub-groups once the issues raised are addressed:

Abstract

Lines 29 to 31: Authors need to better articulate why they are focusing on this population sub-group for their investigation.

Reply: Previous studies showed high prevalence of hypertension in River Nile State-North of Sudan, hence this study to establish whether obesity can be among the main risk factors. see Line 39 to42

Line 44: Logistic regression analysis procedure was not described in the methods section.

Reply: added. See line 47-49

Introduction Section

Lines 59 to 60: Since there is clear evidence that these factors are related to hypertension, what gaps is this study addressing specifically? What new thing is this research contributing to the body of knowledge concerning hypertension among Sudanese?

Reply: This first large study to assess the link between obesity and hypertension in River Nile state. The unique feature of this study is high prevalence of hypertension among obese individuals and establishment of the risk factors. This will have major public health impact in the region as Ministry of health in Sudan will need to think about health education especially with fact that most of the food and fruit are produced in the region of North Sudan around the river Nile. The study will also tie well with our previous published paper (Elmadhoun et al, 2016) high prevalence of diabetes was also noted in north of Sudan.

See line 96 to97

Line 80: Authors need to better articulate the need for the assessment by indicating why they are focusing on River Nile State, since it seems there is enough evidence about the prevalence of hypertension and obesity, and how they are related in Sudan.

Reply: The region is unique as large numbers of tribes of Sudan lives in the region, it is large agricultural hub for food and fruits with many workers travelling to and from the region. The study will be continuation of the series of previous studies we conducted in the region about hypertension in urban, rural and different ethnic groups in River Nile state. See line 90 to 93

Methods Section

Lines 95 to 97: Need to indicate the rationale for exclusion.

Reply: To exclude the presence of confounders and any type of including selection bias. See lines 110 to 111

Lines 103 to 104: Authors need to provide a citation to justify this sample size calculation approach.

Reply: citations provided see lines 119 to 120

Lines 110 to 112: Authors need to provide more details about the data collection procedures. what kind of questionnaire was used? Is it a validated questionnaire? how was it developed?

Reply: It was validated questionnaire including information about the patients' socio-demographic characteristics, clinical history and examination and possible risk factors for developing hypertension. See line 123 to 125

What specific variables were assessed by this questionnaire? How were they defined? How were they measured? "Standardized pretest questionnaire" is too vague.

Reply: Pretesting (or pilot testing) is the stage in the development of a questionnaire that determines the potential effectiveness of the questionnaire. The pretest is conducted prior to the final distribution of the questionnaire to the target population

Line 115: More information is warranted. Indicate what instrument and briefly describe the technique and protocol for measurements, and cite.

Reply: Body weight was measured to the nearest 0.1 kg using a digital scale, and height was recorded to the nearest 0.1 cm using a wall-mounted stadiometer. Measurements were taken for each participant with light clothing and without shoes, and body mass index (BMI) was calculated. See line 129 to 132.

Line 118: What about the classification of obesity? What are the cut-offs?

Reply

The WHO defines normal weight as BMI 18.5–24.9 kg/m2; overweight as BMI 25–29.9 kg/m2; and obesity as BMI ≥30 kg/m while obesity was classified into: Obese class I (30 - 34.9) Kg/m2, Obese class II (35 - 40) Kg/m2, Obese class III (> 40)Kg/m2. See line 133 to 135

Lines 122 to 123: What is the cut-off to determine central obesity?

Reply: Central obesity is defined as a Waist Circumference of >102 cm in males and >88 cm in females, or a Waist to Hip Ratio of >1.0 in males and >0.85 in females. See line 142 to 143.

Lines 127 to 128: Authors reported that mean value of two BP readings were used for analysis, but in the results section, they reported percentages. This discrepancy should be addressed.

Reply: deleted, then we added: we further categorized the patients as those who had controlled and uncontrolled blood pressure readings in the first and second time. See 149 to 151

Line 133: More information is needed for the statistical analyses conducted. Authors need to describe the logistic analysis procedure. What is the primary outcome of interest? What is the main exposure variable and what confounders were included in the analysis, and why?

 Logistic regression test was performed to predict the presence of hypertension (BP more than 130/80mmHg at the second time); which was the primary outcome variable of interest, among studied obese populations. The independent variables were Age of the participants, Occupation, Waist / Hip ratio and BMI. See line 155 to159

Results Section

Line 143: Authors need only report the percentages here and include the sample size in the

descriptive Table.

Reply: Done

Line 154: Authors should make reference to the Table number earlier than when they indicated

it.

Reply: Addressed

Lines 152 to 154: Please indicate what cut-offs were used for obesity classification and central

obesity in the methods section.

Reply; Done

Lines 158 to 161: In the methods section, authors indicated that they would use the average of

the two BP readings to determine the diagnosis of hypertension. The results should reflect that

decision. Also, the methods section should better clarify whether blood pressure was assessed as

a continuous variable in addition to classification as hypertension. In which case, Pearson's

correlation or anova should be used to describe these correlations rather than chi-square. In the

regression analysis, multiple linear regression should also be used, if BP was assessed as a

continuous variable.

Reply: deleted and modified as follow:

Depending on the two BP readings, we categorized the patients as having high and normal blood pressure and finally we relied on the second confirmatory reading for the diagnosis.

Line 163: Table 2 title should be the same as the sub-section title.

Done see table 2 title line 401

Lines 168 to 169: Define cut-offs for central obesity in the methods.

Done see line 142-143

Line 171: Define obesity classification in the methods.

Done see line 133-135

Lines 174 to 177: Comorbidities and symptoms considered should be described in the methods

section, with rationale and citations, where appropriate.

The description of comorbidities and life style habits is present in results sections and linked with table 2

Lines 179 to 180: What is the reference category for weight classification in the logistic

regression analysis? Please clarify this in the methods section.

Reply: added

The reference category for weight classification in the logistic regression analysis was those who were overweight. See lines 159 to 162

Lines 181 to 182: Indicate reference category for the waist to hip ratio variable.

Reply: added

The reference category for waist/hip ratio in the logistic regression analysis were those who have normal values. See lines 160 to 161

Line 185: Was age assessed as a categorical variable or as a continuous variable? Please clarify

in the methods section.

Repl : added

In the logistic regression test, age was assessed as a continuous variable. See lines 161 to 162

Discussion Section

Lines 195 to 197: Ideally, this should be part of the introduction. Also, there's no indication of

the relevance of these numbers to the prevalence level found in your study. Rather than

comparing to the Sub-Saharan Africa region, consider comparing to Sudan. This will make the

comparison more meaningful.

Reply: Moved to introduction. See line 83 to 84

Lines 198 to 200: This should be moved to the methods sections to justify why authors measured

waist and hip circumference.

Reply: moved to methods. See line 136 to 138

Lines 200 to 201: While this is a true statement, it's relevance in this paragraph is not clear.

Consider moving it to the conclusion section.

Reply: moved to conclusion. See line 250 to 251

Line 203: is this obesity or central obesity?

Obesity

Lines 203 to 206: Consider moving this part to the introduction section as well.

Reply: moved to introduction. See line 84 to 86

Lines 213 to 214: Since employment and education are both proxies for socio-economic level

and/or income, in the regression analyses, assess models that control for each one separately.

Reply: Done as requested. See table 5

Lines 220 to 221: Consider moving this up to where you started discussing unemployment.

Reply: moved as requested. See line 222 to 223

Lines 223 to 225: Move up to the section where you discussed education level.

Reply: moved as requested. See line 223 to 228

Line 234: Authors should provide more details on this, i.e. explain why large sample size is

considered a strength.

The larger the sample size, the more accurate the average values will be. Larger sample sizes also help researchers identify outliers in data and provide smaller margins of error. See line 240 to 242

Lines 236 to 238: In the introduction section, authors need to describe more their study

population, say how they are similar to the other Sudanese regions and / or different, and why

they are a focus for this surveillance study.

The region is unique as large numbers of tribes of Sudan lives in the region, it is large agricultural hub for food and fruits with many workers travelling to and from the region. The study will be continuation of the series of previous studies we conducted in the region about hypertension in urban, rural and different ethnic groups in River Nile state. See lines 90 to 93

Tables:

Table 1:

Employment history categorization is unclear. What is the difference between 'employee'

and 'worker'?

reply: Modified to employed and un-employed

BMI is usually reported as interval values, and not percentages. Authors should describe this as "Weight Status" rather than BMI. If they want to report BMI values, they should present the mean (sd) values.

Changed to weight status

Table 2:

• Table title should be the same as section title

DONE

BP values should be interval values, and report mean systolic and diastolic values. In the methods section, authors indicated that they would use the average of the BP readings to determine the classification for hypertension. The results presented in this Table do not reflect this.

Reply : BP was categorized as high and normal, categorical variable and not continuous

• Describe life-style habits variables in the methods section

Reply: described

Table 3:

•

Title is confusing. BP readings should be interval values and not percentages. This should rather be "hypertension"

Reply: categorized as high and normal

Table section titled 'repeated reading after 15 minutes" is confusing. Is this the second BP measurement values? Again, BP values should not be reported as percentages, since they are interval values. How is this different from the classification of HTN in Table 2? Same issue in Table 4.

Reply:

repeated reading after 15 minutes is the second BP measurement values, it was categorized into normal and high values. Regarding the HTN in table 2, it is the Previous history of HTN

Table 5:

•

Table should show the breakdown of categorical variables, reference categories and associated ORs.

Done

• Was this age in years or age-group?

• Reply : yes, added

Was BMI assessed as a continuous variable or as a categorical variable in this analysis?

Reply: Categorical variable

Minor Issues

Writing quality and grammar should be revised to make the paper more comprehensible.

• Grammatical errors need to be addressed here:

o Line 152 : reply: corrected

o Line 180: : reply: corrected

o Line 184 : reply: corrected

o Line 207 : reply: corrected

•

Line 185: Incomplete sentence: sentence completed