Author's response to reviews

Title: Optimal cutoff of the waist-to-hip ratio for detecting cardiovascular risk factors among Han adults in Xinjiang

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Author's response to reviews: see over
Reviewer's report

**Title:** Optimal cutoff of Waist-to-Hip Ratio for Predicting Cardiovascular Risk Factors among Han Adults in Xinjiang

**Version:** 2 **Date:** 14 June 2014

**Reviewer:** Hsin-Jen Chen

Reviewer's report:

This study tried to find “optimal” cut off points for WHR on metabolic disorders in Han people living in Xinjiang. This is not a new topic, and the authors did not did a good job to convince why they select Han people in Xinjiang. Although focusing on a population in a remote area, it did puzzle me why the authors only examined data for Han people and neglected the other two ethnicities, and why they forgot waist circumference (some study suggest waist circumference alone could serve as a better indicator of visceral adiposity than WHR does.)

Thank you for your valuable suggestions.

Major revisions

1. The author did not describe their sample. There should be a table to describe the characteristics of this sample, at least the distribution of age categories. Since the authors used a lot of age-standardization procedure, they supposedly categorized the sample by age.

Reply: We have revised in the paper (Table 1).
2. The authors did not mention clearly sample sizes in their WHR categorization. Sample size is very important information in epidemiologic study. As the authors in this paper did many categorizations, the sample size for every category should be put clearly, including in Table 1, 2, 3, 4, 5, and 6

Reply: We have revised in the paper (Table 2).

3. The authors did age-standardized statistics for Table 1-4. Did they use this age-standardization procedure for Table 5-6, too? I’d recommend them to do it, because WHR is usually changing with age. If age-standardization or age-adjustment was not made in these statistics, the changing statistics with WHR might have been contaminated with the influence of age. If the authors did age-standardization for sensitivity and specificity estimation, please mentioned the procedure in the Methods section.

Reply: We didn’t use the age-standardization procedure for Table 5-6, which were revised in our paper as Table 7 and Table 8. The method of statistical analysis we used in Table 5-6 was consistent with the paper by Rachel P Wildman et al [1]. The name was appropriate body mass index and waist circumference cutoffs for categorization of overweight and central adiposity among Chinese adults. In addition, the sample was acquired using 4-stage stratified sampling method, so it had a good representative features.
4. Please describe what SPSS procedure was used for age-standardization, and what reference population age structure was used to standardize to.

Reply: The procedure of age-standardization was not conducted using SPSS, but calculated by hand according to $p' = \sum \left( \frac{N_i}{N} \right) p_i$. The constituent ratio of each age bracket for standard population $\left( \frac{N_i}{N} \right)$ was obtained according to the population census data of Xinjiang in 2000. The $p_i$ represented the prevalence of CVD related risk factors in each age group within our study population. The method was consistent with the paper by Rachel P Wildman et al [1]. The name was appropriate body mass index and waist circumference cutoffs for categorization of overweight and central adiposity among Chinese adults.

The age structure for Han population according to the population census data of Xinjiang in 2000

<table>
<thead>
<tr>
<th>Age bracket</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>35-39 years</td>
<td>433765</td>
<td>355564</td>
<td>789329</td>
</tr>
<tr>
<td>40-44 years</td>
<td>256934</td>
<td>207298</td>
<td>464232</td>
</tr>
<tr>
<td>45-49 years</td>
<td>208251</td>
<td>190031</td>
<td>398282</td>
</tr>
<tr>
<td>50-54 years</td>
<td>147633</td>
<td>168425</td>
<td>316058</td>
</tr>
<tr>
<td>55-59 years</td>
<td>148123</td>
<td>166182</td>
<td>314305</td>
</tr>
<tr>
<td>60-64 years</td>
<td>169376</td>
<td>134064</td>
<td>303440</td>
</tr>
<tr>
<td>65-69 years</td>
<td>96621</td>
<td>78120</td>
<td>174741</td>
</tr>
<tr>
<td>70-74 years</td>
<td>61335</td>
<td>42489</td>
<td>103824</td>
</tr>
<tr>
<td>75-79 years</td>
<td>32757</td>
<td>22972</td>
<td>55729</td>
</tr>
<tr>
<td>Age Group</td>
<td>Cases 1</td>
<td>Cases 2</td>
<td>Cases 3</td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>80-84 years</td>
<td>12661</td>
<td>12270</td>
<td>24931</td>
</tr>
<tr>
<td>85-89 years</td>
<td>3702</td>
<td>4836</td>
<td>8538</td>
</tr>
<tr>
<td>Total</td>
<td>1571158</td>
<td>1382251</td>
<td>2953409</td>
</tr>
</tbody>
</table>

Tabulation on the 2000 population census of Xinjiang Uygur Autonomous Region.


5. The authors would add more value to this paper if they'll examine waist and BMI in addition to WHR, and compare the three adiposity indicators. Meanwhile, comparing three ethnicities living in Xinjiang would make this paper more scientific value.

Reply: I am very sorry, the paper about waist circumference (WC) and body mass index (BMI) were written by other researchers in our team, such as the paper about WC and BMI had been published on PLOS ONE (Pan S, Yu ZX, Ma YT, et al: Appropriate body mass index and waist circumference cutoffs for categorization of overweight and central adiposity among Uighur adults in Xinjiang. PLoS One 2013, 8:e80185.). Therefore, related contents are not suitable to be mentioned in this paper.

6. Please rearrange the background and discussion. Much background information (such as the existing literature about WHR cut points, comparisons between BMI and visceral fats, background information about the place and people in Xinjiang) should appear in background section, rather than in discussion section.

Reply: We had rearranged the background and discussion.
7. The authors only named the cross-sectional design as their limitation. Some limitations may hide in the details not described in the manuscript yet. First, what is the non-respondent rate, and were there systematic factors for refusal to participate? Second, blood was collected into EDTA tube. Were blood cells and buffy coat removed immediately after blood collection and centrifugation? This is related to some blood biochemistry measurement error. Third, choice of reference population age structure would also affect the final statistics; the authors should talk about what age structure was used for reference, and how this choice could impact the final estimates.

**Reply:** First, the respondent rate was 91.5% in our Cardiovascular Research Survey (CRS). Second, blood samples were centrifuged within two hours at the survey site, and plasma was transferred to separate labeled tubes and transported immediately on dry ice at prearranged intervals to Xinjiang coronary artery disease VIP laboratory. Third, the answer had been replied in question 4. We used the 2000 population census of Xinjiang Uygur Autonomous Region as the reference population to eliminate the influence of age on the prevalence. Limitation part has been revised using purple color.

8. In discussion, there are too many speculative statements explaining their findings, but with flimsy arguments. Please try to reduce unnecessary conjectures in the discussion. In the paragraph beginning at the line 222, the authors used the term “incidence” to describe their results, but in fact, cross-sectional study does not provide
incidence estimate. At final, the writing style and train of thinking is not smooth in the current version. Readability should be improved. Please put more effort into editing.

Reply: The contents referred in discussion had been revised. In line 222 of Discussion, ‘incidence’ was revised as ‘prevalence’.

Reference:

Reviewer's report

Title: Optimal cutoff of Waist-to-Hip Ratio for Predicting Cardiovascular Risk Factors among Han Adults in Xinjiang

Version: 2

Date: 28 May 2014

Reviewer: Crystal Lee

Thank you for your valuable suggestions.

Reviewer's report:

Major Compulsory Revisions

1. As this is a cross-sectional study, the authors should be aware that the data cannot be used to predict cardiovascular risk. It can only be used to discriminate/detect these risk factors. Furthermore, in paragraph 5 of Discussion, the authors used ‘incidence’ to describe the proportion of diabetes and hypertriglyceridemia, the cross-sectional nature of this study means ‘prevalence’ should instead be used. Please make changes to the manuscript accordingly, which includes the title.

Reply: We have revised the title in this paper. The revised title was as follow: Optimal cutoff of the waist-to-hip ratio for detecting cardiovascular risk factors among Han adults in Xinjiang. In paragraph 5 of Discussion part, ‘incidence’ was revised as ‘prevalence’.
2. In Discussion, the authors compared their results to those from other Asian studies, which included a Jordanian study. Is there a reason for studying only the Han population and not the Uighur and Kazakh populations? The sample sizes for these two populations are not much smaller than for Hans.

Reply: I am sorry, the paper about WHR among Uighurs and Kazakhs has been written by other researchers. Therefore, related content is not suitable to be mentioned in this paper.

3. Waist circumference is more widely used as an abdominal measure than waist-to-hip ratio. Is there a reason for investigating WHR and not WC, or both, in this study?

Reply: I am sorry, the paper about WC had been written by other members of our team, one of the papers has been published on PLOS ONE (Pan S, Yu ZX, Ma YT, et al: Appropriate body mass index and waist circumference cutoffs for categorization of overweight and central adiposity among Uighur adults in Xinjiang. PLoS One 2013, 8:e80185.), and other manuscripts were submitted to different journals.

Minor Essential Revisions

1. Abstract, Methods: “... participants were selected using a 4-stage...”

2. Abstract, Methods: “... Han participants were included in...”

3. Background, paragraph 1: “... classified as overweight or obese.”
4. Background, paragraph 2: “... apply the regional optimal...”

5. Sample design: “All participants...”

6. Sample design: “... Hetian Prefecture, and Yili Prefecture.”

7. Discussion, paragraph 4: “... Thailand and Jordan.”

8. Discussion, paragraph 4: “... Asian population in other regions.”

9. Discussion, paragraph 4: Besides of the ethnic...” change to “Apart from ethnic...”

10. Table 1 and 2: “Categorical variables are expressed as n and percentages.”

11. Tables: Apart from the p-values, please round the values to 1 decimal place.

Reply: The questions above have been revised with red color in the paper.

12. Tables: What are the p-values referred to? Difference between groups or overall trend? It is not clear from the Tables, Methods or Results.

Reply: The p-values represent the difference of overall trend in our data. Analysis of variance was used for continuous variables and the chi-square test was used for categorical variables. A value of $P<0.05$ indicates a statistically significant difference.

13. Figure 1 and Results: What is the area under the ROC curve for the respective ROC curves? The curves in Figure 1 suggest that the discriminatory power of WHR for diabetes in men, and dyslipidaemia for both men and women are not much better than chance.

Reply: The area under the ROC curve indicates the area under the curve (AUC). It is
generated by SPSS automatically according to our data under Analyze→ROC Curve. An AUC of 1 is considered to have perfect discriminatory power, and an AUC of 0.5 suggests that the discriminatory power is no better than chance. The higher the value of AUC was, the stronger the discriminatory power of WHR for cardiovascular risk factors was. In this paper, the discriminatory power of WHR was slightly better in women according to AUC. We aimed to find out the cutoff of WHR for detecting cardiovascular risk factors, so we just followed the data which we got from the survey.