

## PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (<http://bmjopen.bmj.com/site/about/resources/checklist.pdf>) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Body Mass Index, Waist-to-Hip Ratio and Cognitive Function among Chinese Elderly: A Cross-Sectional Study
<b>AUTHORS</b>	Zhang, Tao; Yan, Rui; Chen, Qifeng; Ying, Xuhua; Zhai, Yujia; Li, Fudong; Wang, Xinyi; He, Fan; Ye, Chiyu; Lin, Junfen

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Messina Giovanni University of Foggia, Department of Clinical and Experimental Medicine, Foggia, Italy
<b>REVIEW RETURNED</b>	26-Feb-2018

<b>GENERAL COMMENTS</b>	<p>The introduction is too short. In this section the authors can consider the followings recent papers: “Obesity and brain illness: From cognitive and psychological evidences to obesity paradox, by Monda V. et a., 2017; “Healthy lifestyle promotion in primary schools through the board game Kaledo: a pilot cluster randomized trial. Viggiano E et al. 2018” “An assessment of body composition and lifestyle in children aged from 8 to 10 years, by Piombino L et al., Biology and medicine, 2016” “Autonomic nervous system in the control of energy balance and body weight: personal contributions. Messina et al., 2013”.</p> <p>Moreover in the introduction please specifies better the aim of the study.</p> <ul style="list-style-type: none"><li>• To perform this study the authors have used inclusion and exclusion criteria? If yes please specifies it.</li><li>• In the material and method (Body mass index section) the authors declare: All the participants were asked to remove shoes, heavy clothing, and hats prior to height and weight measurements, and have the participants stand straight with heels together, legs straight, and looking straight ahead. In this section you should specify which tool (Make, model, etc.) was used to detect the various parameters (weight, height, etc.).</li></ul> <p>References</p> <ul style="list-style-type: none"><li>• Check all references and references list.</li></ul> <p>Figures and tables</p> <ul style="list-style-type: none"><li>• Specifies the acronym in all tables and figures legends.</li></ul>
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<b>REVIEWER</b>	Inna Lisko Postdoctoral Researcher University of Jyväskylä, Finland
<b>REVIEW RETURNED</b>	04-Apr-2018

<b>GENERAL COMMENTS</b>	GENERAL COMMENTS
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	<p>The purpose of this paper was to investigate the associations between body mass index (BMI), waist-to-hip ratio (WHR) and cognitive function among Chinese elderly. The paper contains interesting findings, however, the value of the paper would be higher if also waist circumference was included.</p> <p>It would be preferable if the language of the paper was revised by a native English speaker.</p> <p><b>SPECIFIC COMMENTS</b></p> <p><b>ABSTRACT</b></p> <ol style="list-style-type: none"> <li>1. As the design of the study is cross-sectional, the word “effect” should not be used. This should be revised throughout the paper.</li> <li>2. In the conclusions of the abstract, it should be stated that “Higher WHR could increase the risk for cognitive impairment.”</li> </ol> <p><b>INTRODUCTION</b></p> <ol style="list-style-type: none"> <li>3. In the first paragraph of the introduction, please provide references for all the sentences.</li> <li>4. At the end of the introduction it is stated that “few studies have evaluated the effect of BMI and WHR on cognitive impairment”. Please provide references and report the main findings of these studies. What specifically are the gaps in the knowledge?</li> </ol> <p><b>MATERIALS METHODS</b></p> <ol style="list-style-type: none"> <li>5. Please inform the number of participants that were contacted. What was the participation rate?</li> <li>6. Please specify if the reported cut-off scores for cognitive impairment (reference number 18) were used in this paper as well.</li> <li>7. Please report specifically how family economics and physical exercised were defined.</li> </ol> <p><b>RESULTS</b></p> <ol style="list-style-type: none"> <li>8. In Table1, please revise “physic excercise” as “physical exercise”.</li> </ol> <p><b>DISCUSSION</b></p> <ol style="list-style-type: none"> <li>9. The role of muscle mass and strength in relation to cognitive functioning should also be discussed. It may actually be that a lower WHR reflects higher muscle mass (and strength) in the gluteal muscles. Thus, it would be interesting to see what the results are for waist circumference. Including waist circumference in the results would add the value of the paper.</li> </ol>
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### VERSION 1 – AUTHOR RESPONSE

Reviewer 1: Prof. Messina Giovanni

1. The introduction is too short. In this section the authors can consider the followings recent papers: “Obesity and brain illness: From cognitive and psychological evidences to obesity paradox, by Monda V. et a., 2017; “Healthy lifestyle promotion in primary schools through the board game Kaledo: a pilot cluster randomized trial. Viggiano E et al. 2018” “ [PubMed](#) An assessment of body composition and lifestyle in children aged from 8 to 10 years, by Piombino L et al., Biology and medicine, 2016” “Autonomic nervous system in the control of energy balance and body weight: personal contributions. Messina et al., 2013”. Moreover in the introduction please specifies better the aim of the study.

Reply: Thanks for your insightful comments. Following your suggestion, we revised the Introduction to highlight our central motivations.

2. To perform this study the authors have used inclusion and exclusion criteria? If yes please specifies it.

Reply: Inclusion criteria were as following: 1) permanent residents who lived for over 6 months in the past year; 2) aged 60 years and above. Exclusion criterion was inability to complete interview due to physical disability. In the revised manuscript, we added the sentences in Page 5.

3. In the material and method (Body mass index section) the authors declare: All the participants were asked to remove shoes, heavy clothing, and hats prior to height and weight measurements, and have the participants stand straight with heels together, legs straight, and looking straight ahead. In this section you should specify which tool (Make, model, etc.) was used to detect the various parameters (weight, height, etc.).

Reply: Body weight and height was measured by digital weight and height scale. Waist and hip circumferences were measured by a soft cloth tape measure. We have updated the related sentences in the Materials and Methods section.

4. Check all references and references list. Specifies the acronym in all tables and figures legends.

Reply: Thanks for your suggestion. We have checked all references and references list carefully, and avoided the acronym in all tables and figures legends.

Reviewer 2: Prof. Inna Lisko

#### ABSTRACT

1. As the design of the study is cross-sectional, the word “effect” should not be used. This should be revised throughout the paper.

Reply: Thank you for pointing it out. We have revised the manuscript, and avoided to use “effect” to describe and discuss our study.

2. In the conclusions of the abstract, it should be stated that “Higher” WHR could increase the risk for cognitive impairment.

Reply: Thanks for your kind suggestion. We revised the sentence, and checked similar mistakes throughout the manuscript.

#### INTRODUCTION

3. In the first paragraph of the introduction, please provide references for all the sentences.

Reply: Thanks for your careful review. Actually, the sentences, “An estimated 46.8 million people currently have dementia in the world, the most well-known form of cognitive impairment, and this number will rise to 131.5 million in 2050. It was estimated over 9.5 million people with dementia in China, which was 20% of the total number of people in the world with dementia. By 2030, the number of people living with dementia in China is expected to rise to over 16 million”, quoted “World Alzheimer Report 2016: Improving healthcare for people with dementia”. We have given the reference in the Reference section. To avoid misunderstanding, we revised the sentence in Page 4.

4. At the end of the introduction it is stated that “few studies have evaluated the effect of BMI and WHR on cognitive impairment”. Please provide references and report the main findings of these studies. What specifically are the gaps in the knowledge?

Reply: We apologize for your confusion resulting from the vague description in our paper. Actually, studies evaluating the association between BMI-specific WHR and cognitive impairment in a large Chinese elderly population were lacking. We have revised the sentence to make it clear.

#### MATERIALS METHODS

5. Please inform the number of participants that were contacted. What was the participation rate?

Reply: About 12320 elders aged 60 years and above were contacted, and the participation rate was 76%. We have reported the rate in Page 5.

6. Please specify if the reported cut-off scores for cognitive impairment (reference number 18) were used in this paper as well.

Reply: The cut-off score of cognitive impairment in this study was education-specific: 17/18 for illiteracy, 20/21 for people with primary education level, 24/25 for people with higher than primary education level. The revised sentences were shown in Page 6.

7. Please report specifically how family economics and physical exercised were defined.

Reply: Thanks for your question. Family economics were self-reported, and physical exercise defined as activities which were carried out to sustain or improve health and fitness in one's spare time. We have updated the sentences in Page 6-7: "including: age, race, education level(self-reported), marital status (self-reported), economic status (self-reported), smoking (self-reported), alcohol drinking (self-reported), physical exercise (activities which were carried out to sustain or improve health and fitness in one's spare time)".

#### RESULTS

8. In Table1, please revise "physic exercise" as "physical exercise".

Reply: Thanks for your careful review. We have corrected the misspelled word, and checked spellings throughout the paper.

#### DISCUSSION

9. The role of muscle mass and strength in relation to cognitive functioning should also be discussed. It may actually be that a lower WHR reflects higher muscle mass (and strength) in the gluteal muscles. Thus, it would be interesting to see what the results are for waist circumference. Including waist circumference in the results would add the value of the paper.

Reply: Thank you for the insightful comments. As your suggestion, we analyzed the association between waist circumference and cognitive impairment. Similar results to WHR were observed: higher waist circumference increased risk of cognitive impairment among the elderly with high BMI. Further discussion was shown in Page 12-13.

#### VERSION 2 – REVIEW

<b>REVIEWER</b>	Inna Lisko Faculty of Sport and Health Sciences, University of Jyväskylä, Finland
<b>REVIEW RETURNED</b>	23-May-2018

<b>GENERAL COMMENTS</b>	The authors have carefully revised the paper and only two minor comments are left:
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	<p>1. In the middle of page 13, the text should be revised as follows: Age-related reduction of muscle mass and strength "is" a major public health concern in older persons. The association between muscle and cognition could mainly "be" derived from muscle strength. Boyle et al. [28] found "that high" muscle strength decreased "the" risk of AD, and Chen et al. [29] had similar findings.</p> <p>The most essential point here is to clarify the direction of the association between muscle strength and cognition.</p> <p>2. Overall the written English in the paper is fluent but there are still some issues with English grammar left which should be revised by a native speaker or a person fluent in English.</p>
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## VERSION 2 – AUTHOR RESPONSE

Reviewer 2: Prof. Inna Lisko

1. In the middle of page 13, the text should be revised as follows: Age-related reduction of muscle mass and strength "is" a major public health concern in older persons. The association between muscle and cognition could mainly "be" derived from muscle strength. Boyle et al. [28] found "that high" muscle strength decreased "the" risk of AD, and Chen et al. [29] had similar findings. The most essential point here is to clarify the direction of the association between muscle strength and cognition.

Reply: Thanks for your professional review. We have revised the sentences according to your suggestion in Page 13.

2. Overall the written English in the paper is fluent but there are still some issues with English grammar left which should be revised by a native speaker or a person fluent in English.

Reply: Thanks for your kind suggestion. We have checked the grammar throughout the manuscript carefully, and invited two experts worked in native English-speaking countries to help us improve writing.