Reviewer's report

**Title:** Combined effect of BMI and body size perception on metabolic syndrome in South Korea: Results of the Fifth KNHANES (2010-2012)

**Version:** 2  **Date:** 4 April 2015

**Reviewer:** Zhila Maghbooli

**Reviewer's report:**

In this study Sook Hee Yoon et al. hypothesize that combined effect of BMI/body size perception could be used as a possible predictive factor for metabolic syndrome. They studied 16,537 people. Their main finding is a combined effect of body size perception and BMI on the risk of metabolic syndrome.

**Major revisions:**

Significant differences on body size perceptions are detected based on age, sex, nutritional status and socioeconomic characteristics. As authors explained in limitation of study, “our analysis did not include important details such as respondent food”. If regression model use to give a prediction, all cofounding variables should be added to model.

**Result section:**

Correlation between BMI and body size perception should be explained.
The prevalence of people who perceived themselves correctly as normal, overweight in BMI categories should be demonstrated.

Is there any correlation between underestimating one’s weight category with cofounding variables such as age, and physical activity?

**Discussion section:**

In discussion section, authors explain why people who perceived themselves as “overweight” had a higher risk for metabolic syndrome. Authors gave details about “health behaviors and modify risk of disease”. It should be explained more than it.

An alternative view is that people who perceived themselves as “overweight” for their body size are actually less active or on unhealthy diet, have a higher risk for metabolic syndrome, even if they have the same BMI as a person who not consider themselves overweight. Therefore, sub-group analyzing based on physical activity could be informative.

Therefore it suggests that especially if subjects are obese but relatively healthy (appropriate lifestyle) they may be more likely to underestimate their weight category as well as their weight-related health risks.
Minor Revisions:

Abstract:
The background is so long. The authors can summary this part of abstract. It should be better start with sentence in line 4 “Body mass index (BMI) has been used as an indirect predictor for the risk of metabolic syndrome…..

Discussion:
Page 11, line 1-2 “phenomenon was observed when we performed a subgroup analysis by age group that excluded females who were overweight based on BMI and <65 years”. In the result section two subgroups (<65 or #65) were included in the analysis. Make clear the findings regarding the excluded females who were overweight (based on BMI and <65 years) in the result section.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests: I declare that I have no competing interests