Introduction

This paper is based on a literature review, the purpose of which was to discuss the limitations of BMI as a measure of obesity, from a nursing perspective and its subsequent effectiveness as a health risk assessment tool across a multi-ethnic population.

Limitations of body mass index (BMI) as a measure of obesity – a nursing perspective

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Lean versus fat mass

- Many of the studies highlight the inability of the BMI to distinguish between lean and fat mass. Obesity is a heterogeneous condition where adipose tissue concentration in total body weight can lead to misclassification in BMI (De Schutter et al., 2008). However,ṃ꾸ng this issues (De Schutter et al., 2008).
- BMI fails to discriminate between percentage body fat and lean mass which consequently results in skewed results. (De Schutter et al., 2008).
- The proliferation of body fat with age, ossing is a known risk factor in the pathogenesis of metabolic syndrome, Type II diabetes (Pfund & Deary, 2012; Corral et al., 2013), and lean body mass (Romero et al., 2012).
- Visceral fat, due to its cytotoxic and endocrine influence on the surrounding organs and associated chronic conditions such as cardiovascular disease (CVD), can be present in the normal-weight BMI range (Romero et al., 2012).
- Due to the aforementioned contrasting properties of normal BMI (i.e., proportionate to subcutaneous fat) versus an increased metabolic health risks associated with abdominal fat (Romero et al., 2012; Corral et al., 2013; Erten & Karan, 2012).
- Another limitation of BMI is its inability to differentiate between body composition and fat type. (Romero et al., 2012).

Location versus type of fat

- As a result of calculating body mass based on a total body weight, the literature also demonstrates that BMI fails to capture the distribution of body fat. (Pfund & Deary, 2012; Corral et al., 2013; Erten & Karan, 2012).
- BMI calculation is based on total body weight and height. However, BMI does not consider the body fat distribution in different body regions. (Romero et al., 2012; Corral et al., 2013; Erten & Karan, 2012).
- The cluster analysis of BMI (kg/m²) and location versus type of fat revealed that the real burden of obesity could therefore be higher than originally proposed which could lead to misdiagnosis for both health care providers and policy makers.

Reduced sensitivity in the mid ranges

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Reduced sensitivity in the mid ranges

- BMI was found to be a good indicator of health risk in older adults but higher BMI categorisation is due in part to its inability to differentiate between location, and type of obesity.
- Research has shown that the application of a single BMI cut-off across populations is problematic in that it does not represent the national variations that exist in health risk association with BMI (De Schutter et al., 2008). Ethnicity and BMI are limited in that it offers a general overall measure and does not represent the anatomical variations that exist across the lifespan (De Schutter et al., 2008).

Conclusion

- By using total body weight, BMI fails to provide a true accurate indication of obesity due to its inability to differentiate between fat and lean mass.
- The use of BMI has also been questioned in the older adult (Bodin et al., 2012; MacTigue et al., 2006) due to height and body composition changes over the lifespan (Rush et al., 2014). A method of BMI ranges for an elderly cohort has been proposed with the disadvantage of BMI ranges being skewed and not assessing the mid-range of BMI accurately.
- BMI across genders showed skewed results (De Schutter et al., 2008). Differences in urban women of five ethnicities from two different Western locations is based on both BMI and waist circumference measured the observed differences in urban women of five ethnicities from two different Western locations.
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By understanding the various discrepancies, the use of BMI as an assessment tool for obesity, and the limitations imposed by its ability to differentiate between fat and lean mass, nurses will be able to apply the scale with discretion to determine a true assessment of health risk for the individual.

References

- Corral, A., Somers, V.K., Sierra-Johnson, J.O., & Landsman, D. (2013). The body mass index (BMI) and waist circumference in defining obesity in different ethnic populations. Obesity, 21(6), 1399-1405.