SJIF Impact Factor: 5.464

WORLD JOURNAL OF ADVANCE HEALTHCARE RESEARCH

ISSN: 2457-0400
Volume: 6.
Issue: 12
Page N. 63-65
Year: 2022

Original Article www.wjahr.com

ROLE OF BODY FAT PERCENT IN ASSESSING HEALTH: A PRELIMINARY REPORT

Salam Jasim Mohammed[1]* and Jawad K. Al-Diwan[2]

[1]Department of Community Medicine, College of Medicine, University of Kufa, Iraq.,
[2]Department of Community Medicine, College of Medicine, Baghdad University, Baghdad, Iraq.

Received date: 04 October 2022 **Revised date:** 24 October 2022 **Accepted date:** 14 November 2022

***Corresponding Author: Salam Jasim Mohammed**

Department of Community Medicine, College of Medicine, University of Kufa, Iraq.,

ABSTRACT

Excess body fat is very important risk factor for many chronic diseases and has adverse effects on health. For measuring overweight and obesity, body mass index(BMI) is the most common method used but it does not differentiate between fat mass(FM) and lean mass. The aim of study was to demonstrate the importance of body fat percent(BF%) in assessing nutritional status of subjects. A total of 200 subjects attending nutrition clinic at Al-Sader medical city at Al-Najaf governorate during the period from 1st of April till end of June was included in this study. The sample collected using a systematic sampling technique. The results show positive relationship between BF% and BMI and 66% of the variability of BMI attributed to BF% in addition to that there is significant effect for age and sex on BF%. This study is a step to demonstrate the role of BF% in assessing nutritional status of subjects.

KEYWORDS: body fat percent, body mass index.

INTRODUCTION

Excess adiposity was considered as a most important risk factor for many diseases.[1] By virtue of its convenience of measurement, body mass index (BMI) is the most common method used to measure overweight and obesity. However, BMI does not allow the measure of body composition, as it does not differentiate between fat-free mass(FFM) and fat mass(FM).[2] They are important factors of malnutrition impacting disease outcome.[3] In childhood, BMI is a poor indicator of body composition.[4] Using BMI alone may underestimate the risk of some nutrition-related disease.[5] Body composition is the relative proportion of muscle, fat, bone, water, and other components of the body[6] FM and fat free mass FFM first put stated by VanItallie et al.[7] It can identified whether the excess body weight is due to FM or fat free mass FFM or both.

Up to my knowledge, no article had been published on effect of BF% on BMI therefore, this study was carried out to show the role of BF% in categorization of body weight.

METHODS

A total of 200 subjects attending nutrition clinic at Al-Sader medical city at Al-Najaf governorate during the period from 1st of April till end of June was included in this study. The sample collected using a systematic sampling technique. Then subjects undergone weight and height measurements. Children younger than 18 years of age, pregnant women and subjects with pacemakers were ineligible for bioelectrical impedance analysis. All subjects were requested to avoid eating or drinking anything except water during the fasting period. Detailed information on the bioelectrical impedance analysis procedure is presented elsewhere.[8,9]

Body weight was measured with an electronic load cell scale to the nearest 0.01 kg. Participants wore only light clothes and without shoes. Stature was measured to the nearest 0.1 cm using a fixed stadiometer. Participants were positioned with heels, buttocks, back and head against the upright surface of the stadiometer with the head positioned in the Frankfort horizontal plane. BMI was calculated as weight in kilograms divided by squared height in meters (kg/m^2).

The BF% and FFM was measured with data from Inbody 370 bioelectrical impedance analyzers (In Body Bldg., 54, Nonhyeon-ro2-gil, Gangnam-gu, Seoul 06313 Korea).

The impact of weight, height, age, and sex on BF% using regression equation and T-test.

RESULTS

The age was 32.7±15.6 years for men and 29.3±8.7 years for women. The BMI was 27.19±9.58 Kg/m^2 in men and 28±9.95 in women. Mean BF% was 26.37±11.52 in men and 37.49±10.38 in women.

Table (1): Baseline anthropometric measures by sex and age groups.

Age/years(n)	BMI (Kg/m^2)	BF%	Fat free mass	BMI_obese	BF%_Obese
	Mean±SD	Mean±SD	Mean±SD	Number (%)	Number (%)
Men (100)	27.1±9.5	26.3±11.5	56±12.8	30(30%)	56(56%)
18-40 (80)	26.7±10.1	24.6±11.4	56.7±13.6	22(27.5%)	38(47.5%)
41-60 (20)	29.1±6.9	33.4±9	53.4±8.8	8(40%)	18(90%)
Women (100)	28±9.9	37.4±10.3	41.7±8.2	36(36%)	58(58%)
18-40 (88)	26.6±9.5	36.1±10.2	40.8±8.1	26(29.5%)	46(52.3%)
41-60 (12)	37.9±7.1	47.1±4.2	48.1±5.9	10(83.3%)	12(100%)
Men VS women	T=-0.588 Df=198 P=0.557	T=-7.16 Df=198 P<0.001	T=9.38 Df=198 P<0.001		
Men (18-40 VS 41-60)	T=-1.001 Df=98 P=0.319	T=-3.029 Df=98 P=0.002	T=1.037 Df=98 P=0.302		
Women (18-40 VS 41-60)	T=-3.938 Df=98 P<0.001	T=-3.651 Df=98 P<0.001	T=-2.978 Df=98 P=0.004		

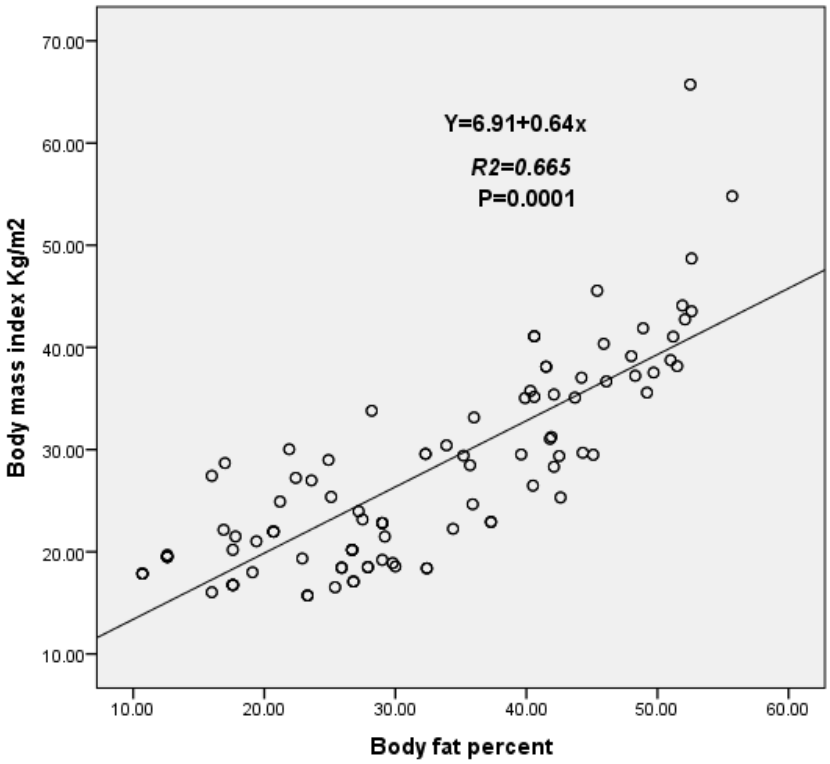

Figure (1) Impact of BF% on BMI.

Figure1 shows that BF % explained 66% of the variability in BMI (R^2 = 0.66).

DISCUSSION

The aim of the study was to change the classical thinking of importance of BMI only, and to consider body composition in assessment of the subjects. The finding that sex with a significant role in BF% and FFM (p=0.0001,p=0.0001)respectively, it is in agreement with that reported in literature.[13,15] Age was showing a positive effect on BF% and FFM (P=0.0001, P=0.004) respectively. This finding is consistent with that reported by others.[12,13,15] it might explained by substitution of lean muscle by fat mass. The study showed that 66% of variability in BMI was attributed to BF%. It is consistent with that of literatures.[7,10] Few of the reasons that can

be adduced for this include protein-energy malnutrition,[10] and disuse muscle atrophy which might arise from inactivity or lack of inadequate physical activity.[11] These findings are similar to that of a study among populations of African origin.[13] Other researchers have also reported that BMI strongly correlates with BF%.[14] BMI was significant positively related to BF%(P=0.001). This finding is similar with that reported in literature in spite of the shape of function (linear or curvilinear).[14] despite the fact that 94% of their subjects had BMI values <30 kg/m^2 and in UK adults.[13] with BMI values <35 kgm^2. The curvilinear relationship is usually seen in samples with higher BMI of >35 kg/m^2 which have been reported in the literatures.[9,15] However, 70% of males and 64% females had BMI of <30 kg/m.^{2} This is in line with previous study where there was a significant linear correlation between BF% and BMI in both black and white women.[12]

CONCLUSION

It is a step to demonstrate the role of BF% in assessing nutritional status of subjects.

REFERENCES

1. Anyaegbu EI, Dharnidharka VR. Hypertension in the Teenager. Pediatr Clin North Am, 2014; 61: 131-51.
2. Martinez KE, Tucker LA, Bailey BW, et al. Expanded Normal Weight Obesity and Insulin Resistance in US Adults of the National Health and Nutrition Examination Survey. J Diabetes Res., 2017; 2017: 9502643.
3. Nuttall FQ. Body Mass Index: Obesity, BMI, and Health: A Critical Review. Nutrition Today, 2015; 50: 117-28.
4. Calcaterra V, Pelizzo G, Cena H. BMI Is a Poor Predictor of Nutritional Status in Disabled Children. What Is the Most Recommended Method for Body Composition Assessment in This Pediatric Population? Front Pediatr, 2019; 7: 226.
5. Whitney DG, Miller F, Pohlig RT, et al. BMI does not capture the high fat mass index and low fat-free mass index in children with cerebral palsy and proposed statistical models that improve this accuracy. Int J Obes (Lond), 2019; 43: 82-90.
6. Jin M, Du H, Zhang Y, et al. Characteristics and Reference values of fat mass index and fat free mass index by bioelectrical impedance analysis in an adult population. Clin Nutr., 2019; 38: 2325-32.
7. VanItallie TB, Yang MU, Heymsfield SB, et al. Height-normalized indices of the body's fat-free mass and fat mass: potentially useful indicators of nutritional status. Am J Clin Nutr, 1990; 52: 953-9.
8. Kuczmarski RJ. Bioelectrical impedance analysis measurements as part of a national nutrition survey. Am J Clin Nutr, 1996; 64: 453S–458S.
9. National Center for Health Statistics. Plan and Operation of the Third National Health and Nutrition Examination Survey, 1988–1994. Vital Health Stat, 1994; 1: 1–407.
10. World Health Organization. Global strategy on diet, physical activity and health: obesity and overweight. Available from: http://www.who.int/mediacentre/factsheets/fs311/en/.
11. Evans WJ. Exercise, nutrition and aging. *J Nutr*, 1992; 122: 796-801.
12. Gallagher D, Visser M, Sepulveda D, et al. How useful is body mass index for comparison of body fatness across age, sex, and ethnic groups? *Am J Epidemiol*, 1996; 143: 228-39.
13. Luke A, Durazo-Arvizzu R, Rotimi C, et al. Relation between body mass index and body fat in black population samples from Nigeria, Jamaica and the United States. *Am J Epidemiol*, 1997; 145: 620-8.
14. Bortz WM., 2nd Disuse and aging. *JAMA*, 1992; 248: 1203-8.
15. Ranasinghe C, Gamage P, Katulanda P, et al. Relationship between body mass index (BMI) and body fat percentage, estimated by bioelectrical impedance, in a group of Sri Lankan adults: a cross sectional study. *BMC Public Health*, 2013; 13: 797.