Turkish Journal of Sport and Exercise
http://dergipark.gov.tr/tsed
Year: 2018 - Volume: 20 - Issue: 3 - Pages:131-136
DOI: 10.15314/tsed.471161

ISSN: 2147-5652

Investıgatıon of waıst / heıght ratıo and body mass ındexes of sports centers*

Ibrahim Kubilay TURKAY[1], Kadir PEPE[2], Ozgur DINCER[3]

[1] Mehmet Akif Ersoy University, Burdur, Turkey
[2] Mehmet Akif Ersoy University Burdur,Turkey
[3] Ordu University Ordu-Turkey
Corresponding Author to İ.K. Türkay, e-mail: kubilay.turk.ay@hotmail.com
**This study was presented as a verbal submission in the Serbian capital Belgrade, on 10-11 December 2016, at the "Effects of physical activity application with anthropolgical status with children, youth and adults" conference.*

Abstract

This research was carried out to examine waist / aspect ratios and body mass indexes of the individuals who came to the sports center between 2006-2016. The universe of the study is the Olimpia Sports Hall, which is connected to Burdur city center, and the sample is 3001 people who came to Olimpia Sports Center. Tape and scale were used for body measurements. In order to analyze the data, frequency and percentages of the group were taken, descriptive statistical data were determined, and the significance level of age and gender groups were analyzed by One Way ANOVA test. Significance was examined at 0.05 level. As a result of the data obtained, a significant difference was obtained when body mass indexes and waist length ratios of the individuals were compared.

Keywords: Individual, Waist / Height ratio, Body mass index, Sports center

INTRODUCTION

Waist / height ratio is the ez abdominal obesity lam index. Children and adults, regardless of age and gender, are also used to identify individuals at risk. The intersection point is 0.5 (1). Body mass index (BMI) is a highly objective measure used to demonstrate nutritional status in both children and adults. BMI is a measure that is considered very easily (weight [kg] / height2 [m]) and is a good indicator of subcutaneous and total body fat in clinical evaluation. In particular, the use of BMI in the evaluation of obesity is recommended (13). Obesity shows a close relationship with cardiovascular (cardiovascular) risk factors. Although waist / hip ratio is used in defining waist region obesity, which is one of the disturbances of community health, waist to height ratio (WHTR) is a detection parameter suggested by Hsieh and Yoshinaga. Waist / height ratio was determined as coronary heart disease risk factors in male and female patients. Ashwell and colleagues suggest that WHTR is a good guide in determining the need for weight loss. WHTR was found to be useful in determining the amount of visceral adipose tissue rather than waist area fat. Fat tissue located between organs such as stomach, liver, intestines and kidneys is called gibi visceral adipose tissue M. This type of lubrication has a close relationship with cardiovascular system diseases, type 2 diabetes, insulin resistance development and some inflammatory diseases. Fat tissue is also recognized as an important endocrine organ in recent years. This tissue is also the subject of important diseases. Obesity is caused by an increase in fat tissue rather than body weight. Cox and Whichelow have determined that WHTR is a better predictor of body mass index (BMI) for predicting deaths for cardiovascular system.

This research was carried out to examine waist / aspect ratios and body mass indexes of the individuals who came to the sports center between 2006-2016.

MATERIALS & METHODS

The universe of the study is the Olimpia Sports Center connected to the center of Burdur and the sample is composed of individuals who come to the sports center. A total of 3001 people have been reached. Measurements were made by the researcher himself, and the body measurements were made by using the weighing and precision weighing.

Waist / height measurements were evaluated using the, Ashwell Bel / Boy Ratio n values (1,2,3). In the result tables, the data are coded as follows.

1 = 0.4 <no risk (0-0.39)
2 = 0.4-0.5 suitable (0.4-0.49)
3 = 0.5-0.6 risk onset (0.5-0.59)
4 = 0.6> risky (0.6-1.00)

"Body Mass Index Classification" was used to evaluate body mass index measurements of individuals. In the result tables, the data is coded as follows.

1 = 0-18.49 Weak
2 = 18.5 – 24.99 Standard
3 = 25- 29.99 Overweight (Fat)
4 = 30- 39.99 Obesity (Overweight)
5 = 40 and above Morbid Obesity

In order to analyze the data, frequency and percentages of the group were taken, descriptive statistical data were determined, and the significance level of age and gender groups were analyzed by One Way ANOVA test. Significance was examined at 0.05 level.

RESULTS

When the body mass index and waist length ratios of the individuals were compared, a significant difference was obtained.

Table 1. Gender Distribution of Participants

Variables	N (Distribution)	%(Distribution)
Man	2074	69.1
Woman	927	30.9
Total	3001	100.0

Table 2. Distribution of Participants by Age Range

Variables	N(Distribution)	%(Distribution)
0-20	1078	35.9
21-30	1303	43.4
31-40	405	13.5
41-50	175	5.8
51-65	40	1.3
Total	3001	100.0

Table 3. Waist/ Height Ratio Distribution of Participants

Variables	N(Distribution)	%(Distribution)
1. 0.4< No risk (0-0.39)	225	7.5
2. 0.4-0.5 Suitable (0.4-0.49)	1354	45.1
3. 0.5-0.6 risk onset (0.5-0.59)	1143	38.1
4. 0.6> risky (0.6-1.00)	279	9.3
Total	3001	100.0

Table 4. Body Mass Index Rates of the Participants

Variables	N(Distr.)	%(Distr.)
1. 0-18.49 Weak	146	4.9
2. 18.5- 24.99 Standard	1420	47.3
3. 25- 29.99 Over weight (Fat)	961	32.0
4. 30- 39.99 Obezity (Over weight)	448	14.9
5. 40 and above Morbid Obezity(Fatal)	19	0.6
Total	2994	99.8
Unanswered	7	0.2
Total	3001	100.0

Table 5. Distribution of Waist/ Height and BMI by Participants According to Their Gender

Variables	Gender	N	Mean	Std. Deviation
Waist/Height	Man	2074	2.4171	0.75964
	Woman	927	2.6591	0.75245
BMI	Man	2068	2.5624	0.80725
	Woman	926	2.6533	0.85343

Table 6. Distribution of the Waist/ Height and BMI of the Participants

Variables	Levene's Test for Equality of Variances	t-test for Equality of Means
		Sig. (2tailed)
Waist/ Height		0.000*
BMI		0.005*
P<0.05*		

Table 7. Distribution Waist/ Height of and BMI by Participants according to Age Groups

Waist/Height	0-20	1078	2.2273	0.72961
	21-30	1303	2.4835	0.72130
	31-40	405	2.8667	0.66153
	41-50	175	3.1600	0.69282
	51-65	40	3.1750	0.67511
	Total	3001	2.4918	0.76552
BMI	0-20	1075	2.3470	0.76442
	21-30	1300	2.5823	0.79751
	31-40	404	2.9257	0.79041
	41-50	175	3.2629	0.75775
	51-65	40	3.0750	0.76418
	Total	2994	2.5905	0.82274

Table 8. Distribution of Participants by Age Range Values

Variables	Age Range	Age Range Values	Sig.(p<0.05)*
Waist/Height	0-20	21-30	0.000*
		31-40	0.000*
		41-50	0.000*
		51-65	0.000*
	21-30	0-20	0.000*
		31-40	0.000*
		41-50	0.000*
		51-65	0.000*
	31-40	0-20	0.000*
		21-30	0.000*
		41-50	0.000*
		51-65	0.070
	41-50	0-20	0.000*
		21-30	0.000*
		31-40	0.000*
		51-65	1.000
	51-65	0-20	0.000*
		21-30	0.000*
		31-40	0.070
		41-50	1.000
BMI	0-20	21-30	0.000*
		31-40	0.000*
		41-50	0.000*
		51-65	0.000*
	21-30	0-20	0.000*
		31-40	0.000*
		41-50	0.000*
		51-65	0.001*
	31-40	0-20	0.000*
		21-30	0.000*
		41-50	0.000*
		51-65	0.779
	41-50	0-20	0.000*
		21-30	0.000*
		31-40	0.000*

	51-65	0.647
51-65	0-20	0.000*
	21-30	0.001*
	31-40	0.779
	41-50	0.647

Table 9. Distribution of Participants Between Groups Waist/Height and BMI

ANOVA		
Variables	F	Sig.
Waist/Height Grup	112.311	0.000*
Bmı Grup	80.824	0.000*
P<0.05*		

DISCUSSION & CONCLUSION

Abdominal obesity is closely related to cardiovascular risk factors. Waist / height ratio was determined as an indicator of risk factors for coronary heart disease in male and female patients (1). Body mass index (BMI) is a highly objective measure used to demonstrate nutritional status in both children and adults. BMI is a measure that is considered very easily (weight [kg] / height2 [m]) and is a good indicator of subcutaneous and total body fat in clinical evaluation. In particular, the use of BMI in the evaluation of obesity is recommended (13).

In terms of gender, 69 %, 1 male and 30.9 % female were identified as women (Table 1). This result is due to the fact that women are less interested in sports in our society.

When the percentage ratios are examined according to age groups, 35.9% are 0-20 years, 43.4 % is 21-30 years, 13.5 % is 31-40 years and 5.8 % is 41-50 age, and 1.3 % 51-65 age group (Table 2). When we look at this result, we see that the preference intensity is between 21-30 age group in the age groups who prefer to do sports, followed by 0-20 age group. The least preferred group is the 51-65 age group. This result is due to the fact that the young population is more interested in sports.

When the waist-length ratio was examined, it was found that the density was in the sections called oran appropriate and risk onset göre according to the ratio of waist / height in the 2nd and 3rd periods (Table 3). According to this result, we can understand that in the Waist / Height ratio, individuals are in the appropriate group but are gradually moving towards the risk group. The reason for this is that we can say still life and malnutrition.

When body mass index ratio percentage was examined, 4.9 % were weak, 47.3 % were standard, 32 % were obese (overweight), 14.9 % were obese (overweight) and 0.6 % were obese. It has been found that the morbid obese (fatal fat) is (Table 4). When we evaluate this result, we can comment again similar to the previous Bel / Boy result. At the moment, approximately half of the individuals are in the standard group but the second rank is the fat class. This shows us that the risk of obesity increases with the same ratio. The main reason for this is that we can say that it is still life and careless diet.

When we examined the mean differences according to their gender, 2074 male and 927 female individuals and 2068 male and 926 female individuals were measured in BMI ratio (Table 5). When we look at the P value of the difference according to sex, it was found that women have higher data at waist / height ratio and BMI values than men (Table 6). Hormonal difference (estrogen) can be said to be.

When we look at the waist / aspect ratio according to age groups, it has been found that the 20-30 age range is at 2 levels, 31-40 age range is 3, 41-50 and 51-65 age range is at 3 levels. In the same way, the 31-40 range was found to be above 3, and the 41-50 and 51-65 age range were above 3 levels in terms of BMI (Table 7). When these data are taken into consideration, we determine that both the waist / aspect ratio and the risk groups in the BMI are the same groups. The reason for this is that as the age progresses, the capacity of movement is low, the energy taken is not too much and the metabolic rate is slowed due to the progression of the age.

When we examine the tukey values of the waist / height and BMI ratios according to age groups, it is seen that the difference between 0 and 20 years and 21-31 years of age creates a significant difference between the two groups (Table 8). When we compared the waist/ height and BMI rates in Anova according to the groups, a significant difference was obtained (Table 9). According to this result, the relations between the groups on each meter support each other. The position of the individual in the Waist-to-Length ratio shows the same way in the BMI. In other words, it is the standard group in the BMI in the same way that the individual is in the standard group. Both gauges measure physical fitness. The waist / height ratio, which is used especially for the determination of the abdominal region lubrication, coincides with the BMI used in the ideal weight calculation and supports each other. The main reasons for the emergence of risk factors for individuals in these gauges are sedentary life, poor nutrition, hormonal differences and age-related problems. Waist-to-length ratio covers the length measured by standard methods and can tolerate errors that may arise from waist circumference measurement. Therefore, looking at the waist / aspect ratio may be useful in different ethnic, age and gender groups. In recent years, the number of studies showing that waist ratio is a valid measurement for detecting central obesity is increasing (16). In the analysis of a study to determine whether waist-to-aspect ratio is better than BMI as an indicator of coronary artery disease, the probability of coronary artery disease is seen, those with a BMI of 25 kg / m2 and above and with a waist-to-height ratio greater than 0.55. The order is more than 3.06 and 6.77 times. The waist to aspect ratio was found to be a better indicator of coronary artery disease than BMI (12). In a study, the mean BMI of men was 22.0 = 16.1 kg / m2 and women 23.3 = 4.7 kg / m2 (14,15). In another study, the mean waist / height ratio of men was 0.47 = 0.07; women was found to be 0.52 = 0.08 (13). BMI is a commonly used method in the diagnosis of obesity, but does not give any idea about body composition and fat accumulation. However, central obesity is very important in terms of metabolic anomaly. Therefore, waist-to-length ratio and waist circumference give better results from the parameters used to measure visceral and abdominal fat distribution (7). In another study on a population with high cardiovascular risk, the combination of waist circumference and waist / height ratio; According to the combination of BMI and B / K ratio, it has been found to be more useful in determining the cadiyometabolic risk factors in terms of clinically (17).

In a long-term follow-up study, it is reported that the increase in the risk of developing type 2 diabetes in individuals aged 18-30 is associated with abdominal obesity (11). Abdominal obesity is also an important risk factor for type 2 diabetes as well as snow-diovascular diseases and metabolic syndrome and it is reported that IDF is involved in the metabolic syndrome diagnostic criteria (8). diabetes prevalence of made TURDEP-I and TURDEP-II study results in Turkey to rise from 7.2 % to 13.7 % along with lifestyle increase in obesity is closely related factor is one of the most important factors affecting it (10,11). Anthropometric measurements and cardiovascular waist of a study on the best measurement ranking made in Turkey to determine the risk / aspect ratio, waist circumference, BMI and waist / were found to be hip ratio (4). The cut-off point for the cardiometabolic risk in Turkish adults was 0.59 in the study conducted in 2009 and 0.5 in the study conducted in 2013 (5). On the other hand, according to the results of a meta-analysis study, waist-to-height ratio from anthropometric measurements related to abdominal obesity and cardiometabolic risk is more important in determining the risk of type 2 diabetes compared to BMI and waist circumference (8). In our study, our main goal was to find the answer to the following question: aba Is an individual who has problems in Body Mass Index in the individuals who applied to the sports center, in the same group in Waist/ Heigth ratio which is a scale used in obesity detection? Do these two gauges support each other in parallel?

As a result of all the data obtained; The body mass index was found to be either obese or obese, but also in the Waist / Height Ratio. Based on these findings, we can make the following suggestions.

Suggestions

✓ Further information should be provided to increase the participation of women and the elderly in regular physical activity. In particular, the number of women trainers equipped with information in terms of the increase in the point of view of our society will increase the interest of women in sports.

✓ For the elderly, the conscious and well-equipped coaches will increase the exercise culture of the elderly and will count the individual's commitment and continuity to exercise when the older person shows the necessary interest and interest.

✓ In order to maintain the intense interest of young people in exercise, the coaches who work in the existing sports centers should be good examples to young people by having sufficient knowledge both in theory and in practice. Thus, young people's interest in sports will be continuous and conscious.

✓ Current sports centers around the country should exercise exercise not only for performance, but for a public health system with a thought and work system. The goal should be social development rather than individual development in sport.

REFERENCES

1. Ashwell M, Cole TJ, Dixon AK. Obesity. New insight into the anthropometric classification of fat distribution shown by computed tomography. Br Med J, 1985; 290:1692.
2. Ashwell M, Cole TJ, Dixon AK. Ratio of waist circumference to height is strong predictor of intra abdominal fat. Br Med J, 1996; 313:559.
3. Ashwell M, Lejeune S, McPearson K. Ratio of waist circumference to height may be beter indicator of need weight management.Br Med J, 1996; 312: 377.
4. Can AS, Bersot TP, Gönen M. Anthropometric indices and their relationship with cardiometabolic risk factors in a sample of Turkish adults. Public Health Nutrition, 2008;12(4), 538-546.
5. Can AS, Yıldız EA, Samur G, Rakıcıoğlu N, Pekcan G, Özbayrakçı S, Palaoğlu KE, Gönen M, Bersot TP. Optimal waist: height ration cut-off point for cardiometabolic risk factors in Turkish adults. Public Health Nutrition, 2009; 13(4), 488-495.
6. Hajian-Tilaki K, Heidari B. Is Waist Circumference A Better Predictor of Diabetes Than Body Mass Index Or Waist-To-Height Ratio In Iranian Adults? International Journal of Preventive Medicine. 2015;6:5.doi:10.4103/2008-7802.151434.
7. International Diabetes Federation. The IDF consensus worldwide definition of the Metabolic Syndrome. Brussels: International Diabetes Federation. (2006).
8. Kodama, S., Horikawa, C., Fujihara, K., Heianza, Y., Hirasawa, R., Yachi, Y., Sugawara, A., Tanaka, S., Shimano, H., Tada lida, K., Sa-ido, K., & Sone, H. Compariosns of the strength of associations with future type 2 diabetes risk among antropometric obesity indicators, including waist-to-height ratio: A meta-analysis. American Journal of Epidemiology, 2012; 176(11), 959-969.
9. Mbanya VN, Kengne AP, Mbanya JC, Akhtar H. Body mass index, waist circumference, hip circumference, waist–hip-ratio and waist– height-ratio: Which is the better discriminator of prevalent screendetected diabetes in a Cameroonian population?. Diabetes research and clinical practice 2015; 108:23-30.
10. Rajput R, Rajput M, Bairwa M, Singh J, Saini O, Shankar V. Waist height ratio: A universal screening tool for prediction of metabolic syndrome in urban and rural population of Haryana. Indian journal of endocrinology and metabolism 2014; 18: 394–9.
11. Reis JP, Loria CM, Lewis CE, Powell-Wiley TM, Wei GS, Carr JJ, Terry JG, Liu K. Association Between Duration of Overall and Abdominal. Journal of the American Medical Association, 2013; 310(3), 280-288.
12. Sabah KMDN, Chowdhury AW, Khan HILR, Hasan H, Haque S, Ali S, Kawser S, Alam N, Amin G, Mahabub SME. Body mass index and waist/height ratio for prediction of severity of coronary artery disease. BMC Research Notes 2014; 7:1-7.
13. Sarria A, Moreno LA, Garcia-Llop LA, Fleta J, Morellon MP, Bueno M. Body mass index, triceps skinfold and waist circumference in screening for adiposity ins male children and adolescents. Acta Paediatr; 2001; 90: 387-392.
14. Satman I, Omer B, Tutuncu Y, Kalaca S, Gedik S, Dinccag N, Karsidag K, Genc S, Telci A, Canbaz B, Turker F, Yilmaz T, Cakir B, Tuomilehto J. Twelve-year trends in prevalance and risk factors of diabetes and prediabetes in Turkish adults. European Journal of epidemiology, 2013; 28, 169-180.
15. Satman I, Yılmaz T, Sengül A, Salman S, Salman F, Uygur S, et al. Population-based study of diabetes and risk characteristics in Turkey. Diabetes Care, 2002; 25(9), 1551-1556.
16. Xu Z, Qi X, Dahl AK, Xu W. Waist-to-height ratio is the best indicator for undiagnosed Type 2 diabetes. Diabetic Medicine 2013; 30: 201-7.
17. Vikram NK, Latifi AN, Misra A, Luthra K, Bhatt SP, Guleria R, Pandey RM.Waist-to-Height Ratio Compared to Standard Obesity Measures as Predictor of Cardiometabolic Risk Factors in Asian Indians in North India. Metabolic syndrome and related disorders 2016; 14:492-9.