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ORIGINAL ARTICLE

# Relationship between obesity and disability in adult individuals-retrospective screening

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**Abstract**
**Aim:** The objective is to examine the relationship between the musculoskeletal system (MSS)-based disability and the body mass index (BMI).
**Material and Method:** The medical board reports (MBR) issued for patients in 2010, who applied for a disability report, were screened. From a total of 283 MBR's, 99 disability reports were included. BMI was calculated and the relationship between disability ratios and BMI was examined.
**Findings:** Out of the 99 patients, 77 were male and 22 were female. The mean age was 46.7±17.8, the BMI was 25.5±5.7 kg/m², the total disability ratio (TDR) was 46±24% and the MSS disability ratio was 33±23%. Both the BMI and age of the patient were significantly correlated with TDR values ($p<0.05$). The female mean age, the TDR, MSS disability ratio and BMI were higher compared to males. However, only the TDR was statistically significantly higher ($p<0.05$). 46% of the disability reports were due to acquired diseases (most commonly caused by arthrosis), 37% injuries (most frequently falls, work accidents and firearm injuries) and 11% were for congenital diseases. It was determined that the most patients, had applied to The Department of Physical Medicine and Rehabilitation and the most affected region was the lower extremities.
**Conclusion:** It was identified that the increase in BMI may have an increasing effect on the disability ratios as well as the positive effect of disability on BMI. This fact should be taken into consideration when the ratio of disability is calculated in health board reports.

**Keywords:** Body Mass Index; Obesity; Disability.

## INTRODUCTION

Several countries, including Turkey, use estimates from the World Health Organization (WHO) as these countries do not have statistical data on disabled citizens.

Disabled individuals are people who have lost their physical, mental, spiritual, emotional and social skills at various degrees at birth or later as a result of an illness or accident and who are not able to adapt to the norms of typical life. The disability profile in Turkey was extensively studied by the "Turkey Disability Survey" conducted by the Turkish Prime Ministry, Department of the Administration of the Disabled. According to the results of the study, the ratio of disabled population to the total population of Turkey was 12.29%.

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Thus, approximately 8.431.937 people in Turkey continue their lives as disabled individuals. However, disability does not only affect the individual who experiences this problem, but also his/her family and immediate circle are economically, socially and psychologically affected (1,2).

The Regulation on the Classification of Disability Criteria and the Reports of the Medical Board to be Issued to the Disabled, which are still in use in Turkey, includes a total of 181 pages. Under the premise of a social state, some advantages such as tax reductions for disabled people, ease of employment, and monthly salary or family allowance can be provided to those who are unable to work in several countries. Thus, determination and correct disability ratios are important.

Also, revealing the parameters which could be effective in this matter is important in terms of advantages that could be achieved by individuals (3). Obesity is a chronic disease that is rapidly increasing in prevalence in developed and developing countries, and places a great financial burden on the related country's economy. By definition, obesity is the excessive amount of fat that accumulates in the body that is sufficient to cause harmful consequences to the health of the individual

based on size, weight, gender and race (4). The objective of the present study is to examine the relationship between the MSS-based disability and the BMI.

## MATERIALS and METHODS

In the present study, the medical board reports issued to patients in 2010, who applied to a 1000-bed university hospital for a disability report, were surveyed. From a total of 283 Medical Board Reports, 177 were related to systems other than the MSS, and a total of 184 cases were excluded, including 3 reports due to lack of data required for MSS calculations and 4 reports with a zero-disability ratio. A total of 99 reports with an indicated disability ratio related to MSS were included in the study. The demographic data of the patients, the disability ratios they obtained from medical boards were screened. MSS and the most effected body area disability scores which calculated according to The Regulation on The Classification of Disability Criteria and the Reports of The Medical Board to be Issued to The Disabled (3) were examined.

Statistical analysis was undertaken using the statistical package for social sciences (SPSS version 16.0). Mean +/- Standard Deviations (SD) were used to identify the data related to the continuous variables, and the number was used to identify the ones related to the categorical variables. Independent sample *t* test, Mann-Whitney U test, and Pearson's correlation tests were used as appropriate statistical methods for analyses. Differences were considered to be significant if p values were $<0.05$.

## RESULTS

Out of 99 patients who were included in the study, 77 were male and 22 were female. The mean age was 46.7±17.8 and the BMI was 25.5±5.7 kg/m$^2$.

When the disability ratios in medical board reports were examined, it was determined that the TDR was 46±24% and the MSS disability ratio was 33±23%. Both the BMI and age of the patient were significantly correlated with TDR values ($p<0.05$). The female mean age, the TDR, the ratio of MSS disability and BMI were higher than the males. However, only the total disability rate was statistically significantly higher ($p <0.05$).

The reasons for obtaining a disability report were identified as follows: 46% were for acquired diseases (most commonly caused by arthrosis), 37% for injuries (most frequently falls, work accidents and firearm injuries) and 11% for congenital diseases. It was determined that the patients who obtained a disability ratio for MSS problems applied to Physical Medicine and Rehabilitation Department the most and when the ratios of obtaining MSS disability were examined, it was found that the most affected region was the lower extremities.

## DISCUSSION

The results obtained in the present study indicated that the positive effect of disability on BMI, as well as the increase in BMI might have increased the disability ratio. This could lead to a negative vicious cycle. In case of incapacitation and disability in the event of illness or injury, BMI should be normalized by removing the ratios due to obesity and/or excessive weight gain. Otherwise, higher incorrect ratios than those caused only by disease and/or injury might be obtained.

In 2002, the Turkey Disability Survey was published to make up for the lack of information and data about disability. In the survey, the ratio of the population with disabilities in Turkey was reported as 12.29% of the total population (1). On the other hand, the prevalence ratio of obesity in Turkey was reported to be 20.5% for males and 41.0% for females, on average 30.3% according to the preliminary Turkey Nutrition and Health Survey 2010 report. In total, 34.6% were overweight, 64.9% were overweight and obese, and 2.9% were extremely obese. Childhood age group rates were found as 8.5% (male 10.1%, female 6.8%) for 0-5 year olds and 8.2% (male 9.1%, female 7.3%) for 6-18 year olds (5).

In 2002 Turkey Disability Survey, the ratio of disabled population was 13.45% for females and 11.10% for males (5). Our study group was found to have a higher disability incidence for women, despite the higher number of the male population. This was in line with the general population distribution. Similarly, the female obesity incidence was 41% compared to the national data and 20.5% for males (5). Based on the data of the present study, females had higher BMI when compared to males.

In a thesis investigating the levels and causes of obesity in individuals with disabilities living in Malatya province, the data for 258 participants were reported. Based on this data, the prevalence of obesity in physically disabled individuals was 13.2% (6).

A study investigating functional mobility and quality of life among obese people emphasized that obese patients were at high risk of loss of function due to the coexistence of musculoskeletal, neurological, cognitive, personal and environmental factors (7). A study of 5304 patients over the age of 60 in the United States conducted between 2005 and 2010 revealed that physical disability was high in the presence of obesity or excessive weight (8). In the present study, the mean BMI of our cases was 25.5±5.7 kg/m$^2$ and was considered in the overweight group.

Obesity is often associated with degenerative processes in the load-bearing joints such as the knee, hip, and lumbar spine. In addition to the increased risk of developing OA with obesity, disease progression and symptom severity increase and treatment response is adversely affected (9,10). In our patient group, arthrosis was the most common etiological cause of MSD. Furthermore, the fact that osteoarthritis occurs more frequently in load-bearing joints is consistent with the more frequent involvement of lower extremities in our MSS-impaired patient group (11,12).

Another point to be emphasized is that obesity in childhood increases the risk of loss of function in later

life (7,13). Thus, it is important for the individuals with congenital diseases to organize their eating habits in order to reduce the possible disability due to loss of function in their future lives, and they should be guided to sufficient physical activity. In Turkey, similar to several developed countries, there are some benefits available for the disabled people such as reduced taxes rates in many areas, employment facilities, and monthly salary or family allowances for those who are unable to work. Therefore, identification and correct disability rating is important. Disability ratios and related daily life limitations for the individual based on the severity of the current medical impairment should be determined in percentages (%) through Regulations Regarding the Reports of the Medical Council specifications that are required to be issued to the Physically Disabled Individuals and medical specialists (3).

For disabilities resulting due to several causes, at least the identification and treatment of preventable causes such as obesity must be conducted; an attempt should be made to lower the disability ratios. Because, as the results of the present study indicate, the disability ratio increases along with the BMI, depending on various reasons; and as the disability increases, the BMI increases due to loss of movement. It was determined in the present study that the increase in BMI might have an increasing effect on the disability ratios as well as the positive effect of disability on BMI. There is a need for further case-control studies to objectively determine and calculate the amount of this effect of increase and to differentiate it from the disability and/or impairment ratios that would be determined after the calculation.

## REFERENCES


1. Basbakanlik Özürlüler Idaresi Baskanligi-Projeler. Özürlülük Araştırmaları. Türkiye Özürlüler Araştırması Temel Göstergeleri-2006. http://www.engelsiz.hacettepe.edu.tr/belge/ozida.pdf (erişim tarihi) 04.01.2017
2. Ulas B, Uncu F, Soylar P. Prevalence of obesity and physical inactivity in individuals who applied to the family medicine center: the case of Elaziğ [Aile hekimliği birimine başvuran bireylerde obezite sıklığı ve fiziksel inaktivite: Elazığ örneği]. Med-Science 2016;5(2):529-38.
3. Özürlülük Ölçütü, Sınıflandırması ve Özürlülere Verilecek Sağlık Kurulu Raporları Hakkında Yönetmelik. http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.17250&MevzuatIliski=0&sourceXmlSearch=%C3%B6z%C3%BCrl%C3%BCle (erişim tarihi) 04.01.2017
4. Gökçel A. Major bir kardiyovasküler risk faktörü: Obezite. BMJ Obezite Eki 2005;1:28-32.
5. Türkiye Halk Sağlığı Kurumu-Obezite, Diyabet ve Metabolik Hastalıklar Daire Başkanlığı-2010 http://beslenme.gov.tr/index.php?page=40 (erişim tarihi) 04.01.2017
6. Çiğdem B, Malatya İl Merkezinde Yaşayan Bedensel Engelli Bireylerde Obezite Prevelansı ve Etkileyen Faktörlerin İncelenmesi, İnönü Üniversitesi Yüksek Lisans Tezi-2013.
7. Forhan M, Gill SV. Obesity, functional mobility and quality of life. Best Pract Res Clin Endocrinol Metab 2013;27(2):129-37.
8. Vásquez E, Batsis JA, Germain CM, Shaw BA. Impact of obesity and physical activity on functional outcomes in the elderly: Data from NHANES 2005-2010. J Aging Health 2014;26(6):1032-46.
9. Güven SC, Özdemir O, Dinçer F. The Relationship Between Osteoarthritis and Obesity. JPMR Sci 2016;19:76-84.
10. Vincent HK, Vincent KR, Seay AN, Hurley RW. Functional impairment in obesity: a focus on knee and back pain. Pain Manag 2011;1(5):427-39.
11. Felson DT. Weight and osteoarthritis. Am J Clin Nutr 1996;63(3 Suppl):430-2.
12. Grotle M, Hagen KB, Natvig B, Dahl FA, Kvien TK. Obesity and osteoarthritis in knee, hip and/or hand: An epidemiological study in the general population with 10 years' follow-up. BMC Musculoskelet Disord 2008;9:132.
13. Araz NÇ, Balat A, Araz M. Metabolic syndrome prevalence in childhood obesity and assesment of obesity related conditions. Med-Science 2012;1(4):271-82.