

**The Association of Low Back Pain with Obesity in One of the  
Primary Health Care Centers†**

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**Objective:** The present study was designed to assess the association between low back pain and obesity in patients attending one of the primary health care centers.

**Methods:** A case control study of patients attending Marka Medical Center (Amman Jordan) was conducted over 7 months (Jan-Jul 1998). All patients with low back pain were included as cases and an equal number of controls, matched for sex and age ( $\pm 3$  years) were randomly selected for comparison. WHO classification was used for categorization of Body Mass Index (BMI).

**Results:** There were a total of 513 (208 males and 305 females) patients complaining of low back pain. Female to male ratio was 1.5 to 1. The mean age of cases was 45.2 years; while that of the controls was 42.8 years. Only 16.7% of patients with low back pain can be considered as ideal body weight as compared with 58.1% among controls. The mean BMI ( $\pm$ SD) of cases was 32.2 ( $\pm 7$ ) Kg/m<sup>2</sup>, while of the controls was 26.5 ( $\pm 6.6$ ) Kg/m<sup>2</sup> (P<0.001) and the difference was statistically significant in both genders (P<0.001).

**Conclusion:** The obese patient is of a higher risk of developing low back pain and it is recommended that, health education regarding weight reduction is a useful means to prevent low back pain.

**Bahrain Med Bull 2000;22(1):**

All physicians should regard obesity as an important health problem because it is an independent risk factor for morbidity and mortality. Obesity is associated with a large number of diseases such as hypertension, coronary heart disease, non insulin dependent diabetes mellitus, hyperlipidemia, cholelithiasis, fatty liver, varicose vein and obesity hyperventilation syndrome<sup>1</sup>. In addition, there is correlation between obesity and osteoarthritis (OA)<sup>2</sup>, particularly of the weight bearing joints (knees, hips and vertebral column)<sup>1</sup> and Orvieto et al have suggested a role of body weight and height in the pathogenesis of low back pain<sup>3</sup>.

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† This article presented in the first Scientific Day of Family Medicine, Royal Medical Services, Amman, Jordan.

Low back pain is a symptom that can be caused by a wide variety of factors such as mechanical, inflammatory, infectious and psychological. During normal daily activities, the forces acting on the back amount to between two and three times the body weight<sup>4</sup>. It would therefore seem reasonable to suggest that an increase in body weight would worsen the symptoms of all types of low back pain whatever the cause was, especially the mechanical type.

The present study was designed to assess the association between low back pain and obesity in patients attending one of the primary health care centers.

## METHODS

A case control study of patients attending Marka Medical Center (situated in East Amman City - Jordan) was conducted over 7 months (Jan-Jul 1998). All patients with chronic low back pain of at least 3 months duration were included as cases. A equal number of controls matched for sex and age ( $\pm 3$  years) were selected from patients who attended the center for other diseases. Pregnant women, patients on corticosteroid therapy or suffering from fluid retention diseases (heart, renal and hepatic failure) were excluded.

For each patient, a data form was completed, consistency of weight in kilograms, height in centimeters and the presence of low back pain. The Body Mass Index (BMI) was calculated for each subject by dividing the body weight (BW) in kilograms (Kg) by the square of the height ( $H^2$ ) in meters (m)<sup>5</sup>. All subjects were weighed on an equilibrated portable balance scale which was zero prior to each weighing to ensure accuracy. The weight was taken without shoes and with light clothes only. Weight was read to the nearest 100g and the standing height was measured without shoes using a tape measure fixed to the wall. The subject stood erect, so that the line of sight was horizontal and the heels and subscapula were aligned with the wall. The distance from the sole of the feet to the top of the head was measured and recorded to the nearest 0.1cm.

Table 1 presents the WHO classification for categorization of Body Mass Index (BMI)<sup>6</sup>. The data was analyzed using personal computer and SPSS version 7.5 software program. The significance of the difference between study group and controls was tested using a paired t-test.

Table 1. WHO classification for categorization of BMI

	<i>BMI Kg/m<sup>2</sup></i>
Underweight	< 18.5
Normal	18.5-24.9
Overweight	>25
Pre-obese	25-29.9
Obese class I	30-34.9
Obese class II	35-39.9
Obese class III	>40

## RESULTS

There were a total of 513 (208 males and 305 females) patients with low back pain. Female to male ratio was 1.5 to 1. The mean age of cases was 45.2 years while that of the controls was 42.8 years.

**Table 2. Distribution of BMI Kg/m<sup>2</sup> among cases and controls according WHO classification**

	<i>BMI</i> <i>Kg/m<sup>2</sup></i>	<b>according WHO classification</b>	
		<i>Cases</i> <i>No. (%)</i>	<i>Controls</i> <i>No. (%)</i>
Underweight	< 18.5	1 (0.1)	14 (2.7)
Normal	18.5-24.9	85 (16.7)	298 (58.1)
Overweight	>25		
Pre-obese	25-29.9	86 (16.8)	68 (13.3)
Obese class I	30-34.9	192 (37.4)	43 (8.3)
Obese class II	35-39.9	94 (18.3)	82 (16)
Obese class III	>40	55 (10.7)	8 (1.6)
Total		513 (100)	513 (100)

As shown in table 2, only 16.7% of cases can be considered to have an ideal body weight as compared to 58.1% among controls. Obesity with BMI  $\geq$  30 Kg/m<sup>2</sup> was found in 66.4% of cases as compared to 25.9% among controls.

**Table 3. Distribution of mean weight (Kg) and height (cm) among cases and controls**

	<i>Cases</i> <i>No (mean <math>\pm</math> SD)</i>	<i>Controls</i> <i>No (mean <math>\pm</math> SD)</i>	<i>Mean</i> <i>differences</i>	<i>t.</i> <i>value</i>	<i>Sig.</i>
Mean weight					
Male	208 (87.4 $\pm$ 13.4)	208 (76.6 $\pm$ 15)	10.7	9.7	000
Female	305 (90 $\pm$ 15.2)	305 (69.6 $\pm$ 15.8)	20.4	16.8	000
Total	513 (87 $\pm$ 14.5)	513 (72.9 $\pm$ 16)	14.2	15.4	000
Mean height	513 (164.6 $\pm$ 8.8)	513 (165.2 $\pm$ 8.5)	-.6	1.3	.18

Table 3 shows that there was a statistically significant difference in the mean weight for cases and controls (P<0.001), but, the difference in the mean height between cases and controls (P>0.18) was not statistically significant.

Table 4. **Distribution of BMI (Kg/m<sup>2</sup>) among cases and controls**

	<i>Cases</i> <i>No (mean ± SD)</i>	<i>Controls</i> <i>No (mean ± SD)</i>	<i>Mean</i> <i>differences</i>	<i>t.</i> <i>value</i>	<i>Sig.</i>
Male	208 (30.1 ± 5)	208 (26.4 ± 5.9)	3.7	6.6	000
Female	305 (34.7 ± 7.8)	305 (26.8 ± 7.1)	7.9	17.1	000
Total	513 (32.2 ± 7)	513 (26.5 ± 6.6)	5.7	16.3	000

Table 4 revealed a statistically significant difference in the mean BMI for cases and controls (P<0.001). The differences were statistically significant for the BMI of the female and male groups, which was 7.9 Kg/m<sup>2</sup> and 3.7 Kg/m<sup>2</sup> respectively (P<0.001).

## DISCUSSION

In this case control study the BMI was higher in cases than controls, higher in females than males and the differences were statistically significant in both genders. This result is similar to that reported by Al-Shamari et al<sup>7</sup>. Whether obesity contributes to the development of low back pain or whether the latter and subsequent inactivity causes obesity is a matter of dispute. It seems clear, however, that obesity worsens the symptoms of an existing low back pain. This fact was clearly demonstrated by McGoey et al<sup>8</sup> who found that among the morbidly obese, 88% had on most days of the month chronic musculo-skeletal pain which was severe enough to interfere with the daily activities. There are preliminary studies which suggest that weight reduction may have favorable effects on low back pain<sup>8</sup>, so, patients with affected weight bearing joints should not only be encouraged to lose weight, but be given the means to do so by dietary instructions and monitoring of their progress<sup>9</sup>. It is recommended that, health education regarding weight reduction is a useful means of preventing low back pain.

## CONCLUSION

**The obese patient is of a higher risk of developing low back pain and it is recommended that, health education regarding weight reduction is a useful means to prevent low back pain.**

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