

# In Women, Depression and Obesity Are Linked

BY ROBERT FINN

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SAN FRANCISCO — Depression might lead to overweight and obesity, and overweight and obesity might also lead to depression, but only in women, according to a longitudinal study of 5,031 participants in the Multi-Ethnic Study of Atherosclerosis.

Numerous studies have demonstrated associations between depression and the development of type 2 diabetes and cardiovascular disease. According to lead investigator Rosemay A. Remigio-Baker, a doctoral candidate at Johns Hopkins Bloomberg School of Public Health, Baltimore, her study suggests that overweight and obesity might provide the link connecting depression with diabetes and cardiovascular disease.

Participants entered the study between 2000 and 2002, when they were 45-84 years of age. Investigators followed them for 5 years. None of the participants had diabetes at baseline. The investigators defined overweight as a body mass index of 25 kg/m<sup>2</sup> or greater, and they defined depression as a score of 16 or above on the Center for Epidemiologic Studies Depression Scale (CES-D).

To see whether depression was associated with the later development of overweight, the investigators restricted their analysis to the 1,496 individuals whose baseline BMI was less than 25. At baseline, 19% of those women and 12% of those men were depressed.

After controlling for age, ethnicity, education, in-

come, smoking status, daily caloric intake, exercise, and levels of interleukin-6 and C-reactive protein, the investigators found that women with depression were 54% more likely to develop overweight or obesity within 5 years than were those without depression. The hazard ratio was statistically significant. The investigators found no statistically sig-

nificant association between depression and incident overweight among men.

To see whether overweight/obesity was associated with the later development of depression, the investigators restricted their analysis to the 3,801 participants without depression at baseline. At baseline, 65% of those women and 70% of those men were overweight or obese.

After controlling for the same covariates, the investigators found that overweight or obese women were 27% more likely to develop depression within 5 years than were normal-weight women. Again, the hazard ratio was statistically significant, and there was no link between overweight/obesity and depression in men.

"Treating depression should be considered as a public health initiative to prevent development of overweight/obesity, especially among women," Ms. Remigio-Baker said. ■

## VITALS

**Major Finding:** Women with depression were 54% more likely to become overweight or obese within 5 years than were those who were not depressed, and women who were overweight or obese were 27% more likely than normal-weight women to develop depression within 5 years.

**Data Source:** A study of 5,031 men and women aged 45-84 years at baseline.

**Disclosures:** The lead investigator stated that she had no disclosures.

## Activity Levels Prevent Weight Gain Only in Lighter Women After Middle Age

BY MARY ANN MOON

FROM JAMA

Physical activity prevents weight gain in middle-aged and older women only if they are already of low or ideal weight, not in those with body mass indexes of 25 or more, according to a large 13-year study.

Even lighter women must sustain vigorous physical activity—1 hour or more of moderate-intensity activity every day, on average—to prevent weight gain over time. Women who exercise regularly but do so at lower intensity gain weight at the same rate as those who are inactive, said I-Min Lee, Sc.D., of Brigham and Women's Hospital, Boston, and her associates.

These findings imply that following federal and other recommendations advocating 150 minutes of physical activity per week isn't sufficient to prevent weight gain in most middle-aged women, although it may well provide other health benefits, the investigators noted.

Dr. Lee and her colleagues assessed weight changes associated with various levels of physical activity, they said, because different expert groups have recommended widely varying levels of activity. For example, the federal government, the American College of Sports Medicine, and the American Heart Association recommend a minimum of 150 minutes per week, while the Institute of Medicine suggests nearly three times that amount, 420 minutes per week, to avoid becoming overweight or obese.

The researchers examined the issue using data from the Women's Health Study, a prospective cohort study of healthy women who had a mean age of 54 years at baseline in 1992. The team assessed 34,079 of these subjects who have been followed up

on periodically since the main portion of that study was concluded in 2004.

At baseline, approximately half the women were classified as inactive, performing less than 150 minutes per week of moderate-level physical activity such as brisk walking, running, bicycling, swimming, weight training, or aerobic dance or exercise. Another 29% performed an intermediate amount of physical activity, and 22% performed a high level, at 21 or more hours of such activity per week.

In an initial data analysis, all three groups showed similar patterns of weight gain over a mean 13 years of follow-up. The inactive group gained a mean of 0.12 kg and the intermediate group gained 0.11 kg, which was an insignificant difference.

Further analysis showed, however, that women starting with BMIs lower than 25 showed an inverse correlation between physical activity and weight gain (JAMA 2010;303:1173-9).

Another analysis examined the likelihood of gaining 2.3 kg or more over the course of 3 years. Again, there was no correlation between activity level and weight gain except in the subgroup of women with BMIs lower than 25. Only in those women did a high level of activity prevent weight gain.

Finally, an analysis of the subgroup of women of normal weight who maintained that weight throughout follow-up showed that they spent at least 60 minutes per day performing moderately intense activity.

These findings indicate that once women are overweight, "it may be too late" for physical activity to stave off further weight gain, the investigators said. ■

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Once women are overweight, "it may be too late" for physical activity to stave off further weight gain.

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## No. of Steps Vary to Reach Activity Goals

BY SHERRY BOSCHERT

FROM THE JOURNAL OF SCIENCE AND MEDICINE IN SPORT

Public health recommendations to get 150 minutes per week of moderate-intensity physical activity could be met by walking 100 steps per minute in that time, but the number of steps needed varies depending on the height of the individual, preliminary data in a small study suggest.

Investigators measured the height, body mass index, and leg length of 20 healthy adults, then measured oxygen uptake by connecting them to a portable spirometer during five 6-minute walks at different speeds. One researcher set the pace in front of the subject using a distance-measuring wheel and cycle computer, and another followed behind to measure steps using a hand-operated counter.

They defined moderate-intensity activity as expending three metabolic equivalents (METs), with each MET defined as oxygen uptake of 3.5 mL/kg per minute. Using the subjects' mean values for body mass index and leg length, they estimated that 100 steps per minute would be needed to expend 3 METs, reported Michael W. Beets, Ph.D., of the University of South Carolina, Columbia, and his associates.

Individuals with longer legs, however, needed fewer the steps for moderate-intensity activity. The correlation between height and leg length suggests that to expend 3 METs, a 5-foot-tall person would need 111 steps per minute, someone who is 5 feet 6 inches tall would need 103 steps per minute, a 6-foot-tall person would need 94 steps per minute, and someone who is 6 feet 6 inches tall would need 85 steps per minute, the investigators said (J. Sci. Med. Sport 2010 [doi:10.1016/j.jsams.2009.11.002]).

The researchers extrapolated that, in order to get 30 minutes of moderate-intensity physical activity, a 5-foot person would need to take 3,330 steps, while a 6-foot person would need only 2,820 steps—a 510-step difference. To meet the public health goal of 150 minutes per week of moderate-intensity activity would require 16,650 steps within that time period for someone 5 feet tall, compared with 14,100 steps for someone 6 feet tall—a difference of 2,550 steps.

The small size of the study limits the ability to generalize the results, but some of the findings are supported by previous data suggesting that 100 steps per minute may be a useful marker on average for meeting moderate-intensity activity goals (Am. J. Prev. Med. 2009;36:410-5). ■

**Disclosures:** The investigators stated that they did not have any conflicts of interest.