High levels of social stress were associated with greater bone loss in postmenopausal women, a Women’s Health Initiative (WHI) longitudinal study found.

Women that reported more negative social interactions, or social strain, and more limitations in social activity, or social functioning, had a greater loss of bone mineral density (BMD) over a 6-year follow-up compared to women that had low stress, reported Shawna Follis, MS, of the University of Arizona in Tucson, and colleagues.

Researchers found that one point higher social strain was associated with a 0.082% greater BMD loss at the femoral neck, 0.108% at the total hip, and 0.069% at the lumbar spine, they wrote in the *Journal of Epidemiology and Community Health*.

In addition, poor quality of social relationships had a greater magnitude of effect on bone loss in postmenopausal women than the number of relationships did, the authors noted.
"Postmenopausal women are at high risk for osteoporosis and fractures, which can lead to devastating consequences such as physical disability and death," Follis told MedPage Today in an email. "With the growing aging population, fracture rates are increasing despite medical advances."

Osteoporosis is an emergent public health concern in the U.S. In a 2017 report, the National Osteoporosis Foundation stated that 10 million Americans have been diagnosed, and 44 million have low bone density. Postmenopausal women are at an even higher risk, and 1 in 2 women break a bone due to osteoporosis in their lifetime.

Previous research found that social stressors such as major lifestyle changes, lack of access to health insurance, and low levels of optimism, education, and life satisfaction may be linked to fractures. However, there is little research about how social stress impacts bone density.

"We know that bone density and bone health does not exist in a vacuum," said Kendall Ford Moseley, MD, medical director of the Johns Hopkins Metabolic Bone and Osteoporosis Center.

Moseley, who was not involved with the research, said that while there are many biochemical causes that affect bone loss, psychosocial stress is an important factor that is often overlooked. Older patients may experience stress from changes in family dynamics, experience with personal illnesses, or financial burdens.

"We tend to downplay the role of psychological factors in that mind-body connection," Moseley told MedPage Today in an interview.

In this study, Follis and colleagues analyzed BMD measures (g/cm²) from 8,271 women at three clinical centers in Arizona, Pennsylvania, and Alabama, who were participants in the WHI bone density sub-study. BMD measures of the femoral neck, lumbar spine, and total hip were taken using a DXA scan both at year 1 and year 6 follow-up visits.

Psychosocial stress was collected via questionnaire at year 1, in which women self-reported levels of social strain, social functioning, and social support, which measured positive relationships and interactions.

Women reporting more negative social interactions were at a greater risk for BMD loss. When compared with patients that had the lowest level of social strain, women that reported the maximum social strain score had an on average 1.728% greater bone density loss in the total hip.

According to Casey Younkin, MD, professor of obstetrics and gynecology at Southern Illinois University of Medicine, the magnitude of the differences in bone density were small. However, he said that this is an area worthy of further analysis.

Although osteoporosis carries risks of morbidity and mortality, Younkin, who was also not involved with the research, said this disease often does not get enough attention.

"This is a massively undertreated area," Younkin told MedPage Today in an interview.

Women that reported high social strain were younger, had a higher BMI, and were more likely to smoke compared with women that reported low social strain, researchers noted. Black, Latina, and Native American women were also more likely to report high social strain than white and Asian women.

Limitations of the study included healthy volunteer bias, which may have resulted in lower reported levels of psychosocial stress. In addition, psychosocial stress was reported only at baseline, so this research may not reflect chronic stress or stress that changed over time, researchers noted.

Moseley said that a holistic understanding of a patient's day-to-day life is an important preventative measure that is highlighted in this research.

"Assessment of a patient for osteoporosis really does involve a discussion of the whole self," she said. "If our patients are so stressed that they are not caring for themselves, inevitably bone health is going to decline as a result."

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