

E-cigarette use may be detrimental to bone health in adults

November 22 2021



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While conventional cigarette smoking is an established risk factor for osteoporosis and osteoporotic fracture, the effects of electronic cigarette (e-cigarette) use on bone health have not previously been studied. In a

novel study of over 5,500 adult e-cigarette users across all age groups investigators found that e-cigarette use was associated with a higher prevalence of fragility fractures. Their findings, appearing in the *American Journal of Medicine Open*, suggest that e-cigarette use may be detrimental to bone health even in young adults.

Fragility fractures are defined as a composite of self-reported fracture of the hip, spine, or wrist that resulted from minimal trauma such as a fall from standing height or less.

Because of their attractive design and vapor delivery system, the use of e-cigarettes has gained increasing popularity. Since their introduction over a decade ago, e-cigarettes have been marketed as a healthier alternative and an aid to conventional cigarette smoking cessation. E-cigarettes contain a combination of propylene glycol, vegetable glycerin and variable levels of nicotine and additives, generating flavored vapor. While conventional cigarette smoking is an established risk factor for osteoporosis and osteoporotic fracture, the association between e-cigarette use and bone health, specifically fragility fractures, had not been previously studied.

Lead investigator Dayawa D. Agoons, MD, MPH, Department of Medicine, UPMC Pinnacle, Harrisburg, PA, U.S., explained, "In my outpatient clinic I saw a patient after surgery to repair a femoral neck fracture. She was a smoker and used e-cigarettes as an aid to quit smoking. I realized there was a knowledge gap in the literature on the potential relationship between e-cigarettes and fragility fractures and decided to conduct this study."

Investigators conducted a cross-sectional analysis using 2017-2018 data from the National Health and Nutrition Examination Survey (NHANES). Using a sample of more than 5,500 American adult men and women, they studied the association between e-cigarette use and

fragility fractures. There were 4,519 (81.2%) never e-cigarette users, 1,050 (18.8%) ever e-cigarette users, and 444 (8.0%) with self-reported fragility fractures.

Results showed a higher prevalence of fragility fractures among e-cigarette users compared to non-users. Researchers also found that individuals who used both conventional and e-cigarettes had a higher prevalence of fragility fractures compared to conventional smokers alone.

The prevalence of e-cigarette use is highest in the 18-25 years age group in the United States. Therefore, this study suggests that young e-cigarette users may be increasing their risk of [osteoporotic fractures](#) over time. The investigators therefore recommend that [healthcare providers](#), especially those in primary care practice, should consider e-cigarettes as a potential risk factor for [fragility](#) fracture and include risk for fracture to the potential negative consequences of e-cigarettes.

"To our knowledge, this is the first study to investigate the relationship between e-cigarette use and [fragility fractures](#)," commented Dr. Agoons. "It fills an important knowledge gap given the increasing popularity of e-cigarette use and the significant economic burden and known morbidity and mortality associated with osteoporotic [fractures](#). Our findings provide data to inform researchers, healthcare policy makers, and tobacco regulators about the potential association of [e-cigarette use](#) with reduced bone health."

Prior observational studies have reported an association between [e-cigarettes](#) and various disease such as COPD, coronary heart disease, and depression.

More information: Association between electronic cigarette use and fragility fractures among US adults, *American Journal of Medicine Open*

(2021). [DOI: 10.1016/j.ajmo.2021.100002](https://doi.org/10.1016/j.ajmo.2021.100002)

Provided by Elsevier

Citation: E-cigarette use may be detrimental to bone health in adults (2021, November 22)
retrieved 21 November 2023 from

<https://medicalxpress.com/news/2021-11-e-cigarette-detrimental-bone-health-adults.html>

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