

**Strength Training and Biological Aging: Telomere Evidence from a National Sample of 4,813 U.S. Adults**

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**ABSTRACT**

Telomere length is an index of biological aging. As humans age, their telomeres become progressively shorter. Additionally, healthy lifestyle practices are associated with longer telomeres and unhealthy habits predict shorter telomeres. **PURPOSE:** This study evaluated the association between weekly time spent strength training (ST) and leukocyte telomere length (LTL) in 4,813 randomly selected U.S. adults, 20-69 years old. **METHODS:** Data collected as part of the National Health and Nutrition Examination Survey (NHANES) was employed to answer the research question using a cross-sectional design. The findings are generalizable to the U.S. adult population. Time spent ST per wk was calculated by multiplying the number of days of ST per wk by min. per session. Participation in other forms of physical activity (PA) was also calculated based on reported involvement in 47 other PAs. Data were analyzed using multiple regression. Partial correlation was used to adjust for differences in potential confounders, including demographic (age, sex, race, and economic status) and lifestyle factors (smoking, BMI, diabetes status, and participation in PA other than ST). **RESULTS:** In the total sample, with all the covariates controlled, ST and LTL were linearly related ( $F=12.1$ ,  $P=0.0016$ ). With men and women studied separately, LTL was not related to ST time in women ( $F=3.3$ ,  $P=0.0813$ ), probably because relatively few U.S. women ( $n=2483$ ) engaged in regular ST (4.9%). Of the 2,330 men in the sample, 9% reported some ST. The association was significant and positive in men. After adjusting for the demographic covariates ( $F=10.3$ ,  $P=0.0032$ ) and the demographic and lifestyle covariates combined ( $F=9.1$ ,  $P=0.0053$ ), results showed that as time spent ST increased, telomere length increased, meaning biologic aging decreased. In men, for each min. spent in ST per week, telomeres were 0.57 base pairs (bp) longer, on average. Therefore, men with the same age, race, economic status, smoking, BMI, diabetes status, and other PA habits, who ST 90 min. per week, had telomeres that were 51 bp longer than non-lifters, on average. In this national sample, the difference in bp associated with 90 min. of ST per wk was equivalent to about 3 yrs less biological aging. **CONCLUSION:** Regular ST is predictive of longer telomeres and less biological aging, especially in men.