

# Poor Posture and Death

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Hyperkyphotic Posture Predicts Mortality in Older Community-Dwelling Men and Women: A Prospective Study

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**Objectives:** To determine the association between hyperkyphotic posture and rate of mortality and cause-specific mortality in older persons.

**Design:** Prospective cohort study.

**Setting:** Rancho Bernardo, California.

**Participants:** Subjects were 1,353 participants from the Rancho Bernardo Study who had measurements of kyphotic posture made at an osteoporosis visit between 1988 and 1991.

**Measures:** Kyphotic posture was measured as the number of 1.7-cm blocks that needed to be placed under the participant's head to achieve a neutral head position when lying supine on a radiology table. Demographic and clinical characteristics and health behaviors were assessed at a clinic visit using standard questionnaires. Participants were followed for an average of 4.2 years, with mortality and cause of death confirmed using review of death certificates.

**Results:** Hyperkyphotic posture, defined as requiring one or more blocks under the occiput to achieve a neutral head position while lying supine, was more common in men than women (44% in men, 22% of women,  $P < .0001$ ).

In age- and sex-adjusted analyses, persons with hyperkyphotic posture had a 1.44 greater rate of mortality (95% confidence interval (CI)=1.12 1.86,  $P=.005$ ). In multiply adjusted models, the increased rate of death associated with hyperkyphotic posture remained significant (relative hazard=1.40, 95% CI=1.08 1.81,  $P=.012$ ). In cause-specific mortality analyses, hyperkyphotic posture was specifically associated with an increased rate of death due to atherosclerosis.

**Conclusion:** Older men and women with hyperkyphotic posture have higher mortality rates.

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