

A Caution on Interpreting Odds Ratios

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WE READ WITH INTEREST THE PAPER BY VGONTZAS ET AL. “INSOMNIA WITH OBJECTIVE SHORT SLEEP DURATION IS ASSOCIATED WITH A HIGH RISK FOR Hypertension.”¹ We found the article to be excellent and highly relevant. However, the article may also serve as a good “teaching moment” to remind researchers of the importance of using caution when interpreting odds ratios. When dealing with a common outcome such as hypertension, the odds ratio can present a greatly distorted picture of the effect size if misinterpreted as a relative risk.²

The authors interpret the odds ratios of 5.12 and 3.53 in their highest risk groups (chronic insomniacs who sleep \leq 5 hours or 5-6 hours per night, respectively) to mean that these groups have a “risk of hypertension 500% or 350% higher” than the reference group (those with no sleep complaints and $>$ 6 hours sleep duration). But this is clearly impossible: the reference group had a hypertension prevalence of about 25% (see Tables 1 and 3), so a 5-fold increase would put the highest-risk group at a hypertension prevalence of 125%. We estimate that the relative risks are instead about 2.5 and 2.2, respectively.³ The most numerically and grammatically correct interpretation is that hypertension prevalence is increased by about 150% and 120%.

Authors have a responsibility to interpret the odds ratios correctly—since impressive statistics such as “a 500% higher risk” catch the attention of readers, the media, and the lay public. We recommend that when reporting odds ratios from logistic regression in a cohort or cross-sectional study, authors estimate the relative risks from the odds ratios according to a simple formula³ or provide readers with the absolute (unadjusted) risks (or prevalences) in the groups of interest. Presenting one or both of these measures will give readers an undistorted sense of the effect size. Caution is particularly warranted when the outcome is common and the effect sizes are modest to strong.

DISCLOSURE STATEMENT

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