

# High physical activity levels may counter serious health harms of poor sleep

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Physical activity levels at or above the weekly recommended amounts may counter the serious health harms associated with poor sleep quality, suggests a large long term study, published online in the *British Journal*

*of Sports Medicine.*

Those who had both the poorest sleep quality and who exercised the least were most at risk of death from heart disease, stroke, and [cancer](#), the findings indicate, prompting the researchers to suggest a likely synergy between the two activities.

Both [physical inactivity](#) and poor sleep are independently associated with a heightened risk of death and/or cardiovascular disease and cancer. But it's not clear if they might exert a combined effect on [health](#).

To explore this further, the researchers drew on information provided by 380,055 middle-aged (average age 55) men and women taking part in the UK Biobank study. The UK Biobank is tracking the [long term health](#) of more than half a million 37-73 year olds, who were recruited from across the UK between 2006 and 2010.

Participants supplied information on their normal weekly [physical activity](#) levels, which were measured in Metabolic Equivalent of Task (MET) minutes. These are roughly equivalent to the amount of energy (calories) expended per minute of physical activity.

For example, 600 MET minutes a week is the equivalent of 150 minutes of moderate intensity activity, or more than 75 minutes of vigorous intensity physical activity a week.

Physical activity levels were categorized as: high (1200 or more MET minutes/week); medium (600 to less than 1200); or low (1 to less than 600); and no moderate to vigorous physical activity, according to World Health Organization guidelines.

Sleep quality was categorized using a 0-5 sleep score derived from chronotype ('night owl' or 'morning lark' preference), sleep duration,

insomnia, snoring and daytime sleepiness: healthy (4+); intermediate (2-3); or poor (0-1).

A dozen physical activity and sleep pattern combinations were derived from the information supplied.

Participants' health was then tracked for an average of 11 years up to May 2020 or death, whichever came first, to assess their risk of dying from any cause as well as from all types of cardiovascular disease; coronary heart disease; stroke; all types of cancer; and lung cancer.

During the monitoring period, 15,503 died: 4095 were from any type of cardiovascular disease and 9064 were from all types of cancer.

Of these, 1932 people died from coronary [heart disease](#), 359 from a brain bleed (haemorrhagic) stroke, 450 from a blood clot (ischaemic) stroke and 1595 from lung cancer.

Some 223,445 (59%) participants were in the high physical activity group; 57,771 (15%) in the medium group; 39,298 (10%) in the low group; and 59,541 (16%) in the no moderate to vigorous physical activity group.

More than half (56%) the participants had a healthy sleep pattern; 42% were classified as having intermediate quality sleep; and 3% were classified as poor sleepers. (Figures are rounded up.)

Those who were younger, female, thinner, better off financially, ate more fruit and vegetables, spent less of their day seated, had no mental health issues, never smoked, didn't work shifts, drank less alcohol and were more physically active tended to have healthier sleep scores.

The lower the sleep score, the higher were the risks of death from any

cause, from all types of cardiovascular disease, and from ischaemic stroke.

Compared with those with the high physical activity + healthy sleep score combination, those at the other end of the scale, with the no moderate to vigorous physical activity + poor sleep combination, had the highest risks of death from any cause (57% higher).

They also had the highest risk of death from any type of [cardiovascular disease](#) (67% higher), from any type of cancer (45% higher), and from [lung cancer](#) (91% higher).

Lower levels of physical activity amplified the unfavorable associations between poor sleep and all health outcomes, with the exception of stroke.

This is an observational study, and as such, can't establish causality, acknowledge the researchers. The study also relied on self-reported data, and the key information on sleep patterns and physical activity was collected at one point in time only, and excluded potentially influential factors, such as job type and household size.

Nevertheless, the researchers conclude: "Physical activity levels at or above the WHO guideline (600 metabolic equivalent task mins/week) threshold eliminated most of the deleterious associations of poor sleep with mortality."

The findings lend weight to efforts to target both physical activity and sleep quality in a bid to improve health, they say.

"As emerging evidence supports a synergistic effect of sleep and [physical activity] on health outcomes, future trials concurrently targeting both behaviours are warranted," they add.

**More information:** Sleep and physical activity in relation to all-cause, cardiovascular disease and cancer mortality, *British Journal of Sports Medicine* (2021). [DOI: 10.1136/bjsports-2021-104046](https://doi.org/10.1136/bjsports-2021-104046)

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