

# Habitual Sleep Deprivation and Type 2 Diabetes: What Actually Comes First?

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Dear Editor,

We have read the comments regarding our study on sleep deprivation and type 2 diabetes mellitus (T2DM)<sup>1</sup> with interest and would like to address the authors points.

We would like to emphasize that it was shown by several studies that sleep deprivation is a risk factor for diabetes and, therefore, sleep deprivation causes T2DM.<sup>2,3</sup> In our study, we asked participants to report the number of sleep hours per night and not the number of awakenings per night, which might be the case in some patients suffering from T2DM and/or obstructive sleep apnea (OSA). The main objective of the study was to assess the association of sleep duration rather than sleep disturbance with T2DM.<sup>3</sup>

Regarding the comment about the use of *t*-test to compare night sleep duration in diabetic and control groups; the Student's *t*-test was done and mentioned in the statistics section and the results given in Table 1.

Regarding the second point raised by the author, we agree that a case-control study will not prove temporality. Therefore, we reported that sleep deprived subjects have a higher chance of developing diabetes as explained above. In logistic regression,  $\beta$  represents the odds ratio.<sup>4</sup> As mentioned in the statistics section, the association between nocturnal sleep duration and diabetes was performed using diabetics as the outcome variable, and sleep duration

as predictor using lipids and body mass index as confounders. The values of  $\chi^2$  for increased OSA risk and diabetes in males and females, although not mentioned in the table, were stated at the end of result section.

Finally, regarding the last comment, the author is mixing sleep deprivation with risk for OSA. In Table 3, we mentioned that there was no significant association between risk of OSA in cases and controls. Therefore, it was not included in the logistic regression model. It is worth to mention that our study did not test the effect of sleep deprivation on the development of diabetes, but it addressed the issue of association between sleep deprivations and diabetes.

## Disclosure

The authors declared no conflicts of interest.

## REFERENCES

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