



## Letter to the Editor

**Comment on "Hearing loss, diet, and cognitive decline: interconnections for dementia prevention"**

Dear Editor,

We read with great interest the article titled "Hearing loss, diet, and cognitive decline: interconnections for dementia prevention", and commend the authors on their significant contribution to understanding dietary patterns as modifiable factors for reducing both hearing loss and cognitive decline in older adults [1]. However, we would like to raise some considerations to further clarify the applicability and robustness of these findings.

First, the self-reporting of hearing loss raises key concerns. As acknowledged by the authors, the reliance on self-reported hearing loss may have introduced measurement bias. While validated in large population studies, [2,3] self-reports lack the precision of pure-tone audiometry, the gold standard for hearing assessment. This limitation may have led to either underestimation or overestimation of cases, particularly for mild hearing loss, thus potentially affecting the observed associations between hearing loss, dietary patterns, and cognition. Additionally, the binary nature of this self-reported measurement (hearing loss: yes/no) limits the assessment of hearing loss severity and its progression. Given that the biological mechanisms linking hearing loss, diet, and cognitive function may differ by severity, understanding dose-response relationships across mild, moderate, and severe cases of hearing loss would help refine the proposed pathways and implications for intervention.

Second, dietary patterns and residual confounding merit further discussion. The study highlights the protective role of healthful dietary patterns like MIND, Mediterranean (MedDiet), and DASH diets in delaying the onset of hearing loss and mitigating cognitive decline. While these findings align with existing evidence linking vascular health to hearing and brain function, [4] dietary intake was self-reported using a Food Frequency Questionnaire, which introduces recall bias and inaccuracies in nutrient quantification. Moreover, although the multivariable models accounted for several socio-demographic and cardiovascular factors, the possibility of residual confounding remains. For example, physical activity is an important predictor of both hearing health and cognitive performance but appears not to have been fully adjusted for in the models.

Third, the Kaplan-Meier and survival analysis approaches warrant scrutiny. The use of Kaplan-Meier survival curves and discrete-time hazard modeling is well-suited for exploring the time to hearing loss within tertiles of dietary adherence. However, hearing loss is often a gradual process, and cognitive decline may precede subjective recognition of auditory impairment. The temporal distinction between pre- and post-hearing loss cognitive decline was modeled effectively but may still un-

derestimate potential reverse causation if earlier cognitive changes impair hearing perception.

In summary, the study delivers novel insights into lifestyle approaches for addressing hearing loss-related dementia risk. We thank the authors for providing a robust foundation for future studies and eagerly await follow-up research incorporating objective hearing measures, refined temporal modeling, and comprehensive lifestyle interactions.

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**Declaration of competing interest**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

**CRediT authorship contribution statement**

**Cuiqing Zhao:** Conceptualization, Data curation, Formal analysis, Writing – original draft. **Jian Gong:** Conceptualization, Writing – original draft. **Jia Huang:** Supervision, Writing – review & editing.

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**Declaration of Generative AI and AI-assisted technologies in the writing process**

I confirm that I have disclosed the use of AI and AI-assisted technologies in the writing process

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