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**A SYSTEMATIC REVIEW ON THE
ASSOCIATION BETWEEN DIETARY INTAKE OF OMEGA-3 PUFAS AND
HEARING**

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Abstract

Title: A systematic review on the association between dietary intake of OMEGA-3 PUFAS and hearing

Background: The current systematic review aimed at characterizing the links between HL and dietary consumption of Omega-3 PUFAs through assessing the audiological findings of adults with and without dietary consumption of Omega-3 PUFAs and checking its preventive function against hearing loss and other benefits.

Methods: Studies except for narrative and systematic reviews, published until 20 April 2022, including adult populations of the age above 49 years with normal hearing sensitivity and sensorineural hearing loss (SNHL) with Pure tone audiometry (PTA) and semiquantitative food-frequency questionnaire (SFFQ) as outcome measures were included. The systematic searches were carried out in 6 electronic databases including PMC, Scopus, PubMed, The Cochrane Library, Web of Science, and Embase with keywords “Omega-3 polyunsaturated fatty acids”, “Omega-3 PUFAs” and “hearing” used with the Boolean operators ‘OR’ and ‘AND’. This study is registered on PROSERO, number CRD42022316478.

Findings: The data were extracted from a total of three studies, with a total 66,832 participants from 49 years to 80 of age for participants and the results showed that participants who consumed ≥ 1 or < 2 portions of fish/week at baseline, had a lower risk of a decline in hearing function over the next five years than for participants who consumed only one portion of fish.

Interpretation: Higher plasma concentrations of n-3 PUFA over three years were discovered to have an association with less low-frequency hearing loss. The number of qualitative studies included is the most substantial while variations in dietary factors, study designs, and outcomes are seen in the data across studies add on as limitations of the current systematic review. It is imperative that further research into this area is conducted considering the limited and sometimes contradictory results.

Rationale

Nutrition is a vital component of health and development as it contributes to more favorable infant, child, and maternal health, stronger immune systems, safer pregnancy and childbirth, fewer non-communicable diseases like diabetes and cardiovascular disease, and longer life expectancy (Marshall et. al., 2021). In humans, nutritional status affects the development of a variety of diseases (Jung et. al., 2019), and hearing loss is one of these conditions (Rodrigo et. al., 2021). Nutrients such as macronutrients (Omega-3 PUFA, carbohydrates, fats, proteins, sugar), micronutrients (magnesium, potassium, riboflavin, niacin, vitamin A, C, E), and others (coffee, chocolate and tea) have been reported to possibly prevent/ delay the development of ARHL (Rodrigo et. al., 2020).

Omega-3 PUFAs have been reported to play a role in protecting neurons and can be considered as probable management options for a variety of neurological as well as neurodegenerative disorders, which help in maintaining the central auditory pathway functions (Dyall et. al., 2015). Even though there have been systematic reviews addressing the association between nutrition and hearing loss as a whole, addressing the

individual association is necessary. Thus, we systematically reviewed the association between the consumption of omega-3 PUFAs and hearing.

Keywords: Omega-3 Polyunsaturated fatty acids, Omega-3 PUFAs, Nutrition, hearing