

A low omega-3 index is just as strong a predictor of early death as smoking

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A new research paper published in the *American Journal of Clinical Nutrition* last week showed that a low omega-3 Index is just as powerful in predicting early death as smoking. This landmark finding is rooted in

data pulled and analyzed from the Framingham study, one of the longest running studies in the world.

The Framingham Heart Study provided unique insights into cardiovascular disease (CVD) risk factors and led to the development of the Framingham Risk Score based on eight baseline standard risk factors—age, sex, smoking, hypertension treatment, diabetes status, [systolic blood pressure](#), total cholesterol (TC), and HDL cholesterol.

CVD is still the leading cause of death globally, and risk can be reduced by changing behavioral factors such as unhealthy diet, physical inactivity, and use of tobacco and alcohol. Therefore, researchers in this study say biomarkers integrating lifestyle choices might help identify individuals at risk and be useful to assess treatment approaches, prevent morbidity, and delay death.

Among the diet-based biomarkers are [fatty acids](#) (FAs), whether measured in plasma or [red blood cell](#) (RBC) membranes. The FAs most clearly associated with reduced risk for CVD and for total mortality (i.e., death from any cause) are the omega-3 FAs, EPA and DHA, which are typically found in fish like salmon and herring, as well as omega-3 supplements like fish and algal oil.

In a 2018 report that included 2500 participants in the Framingham Offspring Cohort followed for a median of 7.3 years (i.e., between ages 66 and 73), the baseline RBC EPA + DHA content [the omega-3 [index](#) (O3I)] was significantly and inversely associated with risk for death from all causes.

In fact, individuals with the highest omega-3 index were 33% less likely to succumb during the follow-up years compared with those with the lowest omega-3 index. Similar associations have been seen in the Women's Health Initiative Memory Study, the Heart and Soul Study, and

the Ludwigshafen Risk and Cardiovascular Health Study.

The omega-3 index measures the amount of EPA and DHA in red blood cell membranes and is a marker of omega-3 status. An optimal omega-3 index is 8% or higher, an intermediate omega-3 index is between 4% and 8%, and a low omega-3 index is 4% and below. Most Americans have an omega-3 index below 4%, which puts them a significantly higher risk of [early death](#).

According to researchers in this study, the finding that any FA-based metric would have predictive power similar to that of the well-established standard risk factors was unexpected, and it suggests that RBC FAs—via imperfectly understood mechanisms—somehow reflects an in vivo milieu that consolidates into one measure the impact on the body of all these standard risk factors.

"It is interesting to note that in Japan, where the mean omega-3 index is greater than 8%, the expected life span is around five years longer than it is in the United States, where the mean omega-3 index is about 5%. Hence, in practice, dietary choices that change the omega-3 index may prolong life," said Michael McBurney, Ph.D., FCNS-SCN, lead researcher in this study. "In the final combined model, smoking and the omega-3 index seem to be the most easily modified risk factors. Being a current smoker (at age 65) is predicted to subtract more than four years of life (compared with not smoking), a life shortening equivalent to having a low vs. a high omega-3 index."

"The information carried in the concentrations of four red blood cell fatty acids was as useful as that carried in lipid levels, blood pressure, smoking, and diabetic status with regard to predicting total mortality," said Dr. Bill Harris, who was also an author on this study. "This speaks to the power of the omega-3 index as a risk factor and should be considered just as important as the other established [risk factors](#), and

maybe even more so."

More information: Michael I McBurney et al, Using an erythrocyte fatty acid fingerprint to predict risk of all-cause mortality: the Framingham Offspring Cohort, *The American Journal of Clinical Nutrition* (2021). [DOI: 10.1093/ajcn/nqab195](https://doi.org/10.1093/ajcn/nqab195)

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