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Coronary heart disease risk reduction and consumption of foods rich in omega-3 polyunsaturated fatty acids: A psychosocial perspective using information to mediate between attitudes, intentions and decision-making behaviour

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Background – Long chain omega-3 polyunsaturated fatty acids (n-3) are thought to benefit human health, particularly in respect to reducing risk of heart disease. However, most Australians do not consume enough n-3. Socio-demographic variables and psychological variables such as perceptions, attitudes and beliefs impact on food-orientated health behaviours. Furthermore, consumers are demanding information on the health-promoting properties of food with conflicting evidence as to whether this knowledge increases consumption of certain foods.

Objective – The aim of this research was to understand what demographic, situational and psychological variables influence people’s attitudes, beliefs, and ability to consume beneficial quantities of n-3 foods.

Design – A quantitative longitudinal study involved a survey of 500 adult South Australians. Using an adaptation of Protection Motivation Theory (1), the study examined facilitators of and barriers to the consumption of n-3 foods. A 3 x 2 x 2 informational source design was used. Half the sample was provided with information about n-3 foods at baseline, with further provision of additional information over a 6-month period. The effect of this intervention on attitudes, intentions and subsequent follow-up behaviour was compared across people with varying levels of heart disease risk.

Outcomes – Results of preliminary analyses at baseline show significant attitudinal and intentional differences toward the consumption of n-3 foods dependent upon level of heart disease risk. Information provision was also found to affect the likelihood of increasing consumption of some n-3 foods.

Conclusions – The study has implications for how health-related information relating to n-3 and cardiac risk may be provided to enhance people’s awareness and behaviour.

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Dietary omega-3 polyunsaturated fatty acids counteract murine experimental periodontitis

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Background – Periodontitis is an infective disease caused predominantly by Gram negative anaerobic bacteria. However it is becoming apparent that alveolar bone loss, which characterises periodontitis, results from the host inflammatory response to pathogenic bacteria and not the infectious agents directly. Omega-3 polyunsaturated fatty acids (PUFA) have recognised anti-inflammatory effects and their oxygenated derivatives are key mediators in resolving inflammation.

Objective – To test the hypothesis that dietary supplementation with tuna fish oil rich in the omega-3 PUFA docosahexaenoic acid would reduce alveolar bone loss in mice inoculated with periodontopathic bacteria.

Design – 80 mice were fed experimental diets containing either 10% tuna oil (HiDHA; NuMega Ingredients, Australia) or sunola oil (placebo) for 57 days. After two weeks each dietary set was split into four groups of ten mice, which were a) untreated or inoculated with b) Porphyromonas gingivalis, c) P. gingivalis and Fusobacterium nucleatum, d) carboxymethylcellulose (treatment control). Oral cavity soft tissues were taken from mice at sacrifice for gas chromatographic determination of fatty acid composition. The maxilla was removed, stained with methylene blue and digitally imaged to assess bone loss around the upper molars.

Outcomes – Omega-3 PUFA levels were substantially higher in oral soft tissues of mice fed tuna oil compared to those fed sunola oil. Eicosapentaenoic acid increased from 1.9 ± 1.1 to 18.0 ± 2.6 mg/100g and docosahexaenoic acid from 335 ± 41 to 579 ± 72 mg/100g. Mice fed tuna oil exhibited 72% less alveolar bone resorption in response to infection with P. gingivalis and 54% less bone resorption following the combined inoculum than those fed sunola oil (P<0.05).

Conclusions – Fish oil dietary supplementation may have potential benefits as a host modulatory agent in the prevention and/or adjunctive management of periodontitis.