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Fish and seafood products as a source of iodine in the UK and reasons for consumers' low intake

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Fish and seafood products have a rich nutrient profile (omega 3 fatty acids, protein, vitamin D, vitamin A, selenium, iodine)[1]. Their consumption has been related to cardiovascular (25 % reduction in CHD risk, 6 % decreased risk for all cause mortality) and cognitive health benefits[2–4]. Iodine, key in thyroid hormones production, is present in fish in high concentrations (~105 µg/100 g in white fish vs. 48 µg/100 g in oily fish)[5]. The National Diet and Nutrition Survey (NDNS) has shown that fish intake remains low in the UK, despite its promising potential as a dietary source of iodine - a re-emerged nutrient insufficiency in the UK[6,7]. However, the full range of reasons of this low intake have not been explored. This study investigated the consumption and perceptions (knowledge, awareness) around seafood products, as well as the factors which influence their intake.

A validated questionnaire was disseminated online and in the community (social media, fora, snowball recruitment in public spaces) to English-speaking UK residents aged >14 years, from November 2016 to May 2017. The questionnaire was informed by the theory of planned behaviour (TPB), including dimensions of attitudes towards behaviour, perceived behavioural control, subjective norms, intentions, behaviour (fish intake) and knowledge as an external construct. The drivers for choosing seafood products were rated using 5-point Likert scales (1: not at all, 5: very much). Iodine intake was estimated using a validated food frequency questionnaire[8]. Descriptive statistics included median and interquartile range (IQR) for continuous non-parametric data and as frequencies (n) and percentages (%) for categorical data (SPSS version 21.0, IBM Corporation). Groups were compared with Mann-Whitney U tests. Binomial logistic regression was used to predict fish intake as a binary dependant variable.

The median age of the participants (n = 1511) was 31 years (IQR 21–37), with 5 % (n = 75) following a vegetarian or vegan diet. Fish intake was 1·9 (IQR 0·9–3·7) servings/week, with over half (53 %, n = 797) of the respondents consuming below the recommended 2 portions/week ("low" fish consumers). The median iodine intake from fish was 24 µg/day (IQR 13-41), in a total of 122 µg/day (IQR 79-186), below the World Health Organisation recommendation (150 µg/day), indicating an insufficient intake. "High" fish consumers (47 %, n = 711) had higher iodine intake compared to "low" fish consumers (149 µg/day (IQR 104-222) vs 102 µg/day (IQR 60-149), $p < 0{\cdot}01$). The TPB explained 16 % (Nagelkerke R^2) of the variance on whether the recommendation for fish would be achieved. "High" fish consumers (⩾2 servings/week) had significantly higher knowledge, intentions, attitudes and perceived behavioural control towards fish consumption compared to "low" consumers.

The main factors influencing fish intake (Likert scale 4&5) included taste (85 %, n = 1281), freshness (65 %, n = 976), cost (61 %, n = 918) and convenience of preparation (54 %, n = 813). Related health risks (53 %, n = 804) and environmental practices (38 %, n = 566) also emerged as potential barriers. Both "low" (63 %, n = 498) and "high" (68 %, n = 483) fish consumers agreed that they would increase fish intake or provision to the household if they were told about the importance of fish as an iodine-rich source for pregnancy and children.

Fish is an iodine-rich dietary source, but is only contributing 16 % in the recommended adult iodine intake (150 µg/day). Exploring perceptions and barriers in the increase of fish in the diet could inform the design of future interventions that would aim to increase iodine intake of the population. Fish consumption has a potential to facilitate the population achieving a sufficient iodine intake, when the recommended fish intake is met.

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