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A Study on Consumption of Omega-3-Fatty Acids and Imparting Nutrition Education Among Adolescents in Puducherry

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Abstract

The present study on intake of Omega-3-fatty Acids was carried out among Adolescents. The study was conducted at rural, semi-urban and Urban areas of Puducherry being the native place for the researcher. The data was collected for a period of three weeks by using the prepared tools. The data collection was done by using Google forms framing the questionnaire, as it was a lockdown period due to the COVID-19 pandemic situation and it was framed in English to the subjects, and in case of doubts, clarified through telephone interview. Selection of sample based on purposive method a total of 170 subjects adolescent subjects, those who were willing to participate were selected as the sample. The study population includes subjects only women were chosen between age group 11-19 years to be studied for three weeks. The research comprises of survey and clinical diagnosis of the subjects. The preliminary questions included general socio-economic status of the individual like Age, Gender, Area of the Respondent, Mother Tongue of the subjects, Religion, Educational qualifications, Occupation, Type of Family, Monthly income earned by Family members, and Marital Status of the respondents. Nutrition education was implemented and results based on dietary intake was monitored .

Keywords: Omega-3 Fatty Acids, Diet, Nutrition.

Introduction

Omega-3 are polyunsaturated fatty acids (PUFAs) with more than one carbon-carbon double bond in their backbone. They are polyunsaturated because their chain comprises several double bonds. One way in which a fatty acid is named is determined by the location of the first double bond, counted from the tail, that is, the omega (ω-) or the n- end. Thus, in omega-3 fatty acids, the first double bond is between the third and fourth carbon atoms from the tail end. These essential nutrients have to be introduced through diet. They can be found in fish such as sardines, salmon, tuna, halibut, and other seafood such as algae and krill (Ulven. S. & etal.,2011), and in lake trout, in some plants, and nut oils. These PUFAs, which are

stored in membrane phospholipids, are responsible for numerous cellular functions including the maintenance of the cell membrane structure, fluidity, signaling, and cell-to-cell interaction.

Review of Literature

Omega−3 fatty acids, also called Omega-3 oils, ω−3 fatty acids or n−3 fatty acids, US (National Institutes of Health,2021) are polyunsaturated fatty acids (PUFAs) characterized by the presence of a double bond, three atoms away from the terminal methyl group in their chemical structure. They are widely distributed in nature, being important constituents of animal lipid metabolism, and they play an important role in the human diet and in human physiology (Scorletti E, Byrne CD. 2013). Moderate and high-quality evidence from a 2020 review showed that EPA and DHA, such as that found in omega-3 polyunsaturated fatty acid supplements, does not appear to improve mortality or cardiovascular health. There is weak evidence indicating that α-linolenic acid may be associated with a small reduction in the risk of a cardiovascular event or the risk of arrhythmia (Abdelhamid, Asmaa. S etal., 2020).

ω-6 and ω-3 PUFAs are essential for the synthesis of eicosanoids such as prostaglandins (PGs), prostacyclin (PGI), thromboxane (TX), leukotrienes, hydroperoxytetraenoic acid, hydroxy-eicosatetraenoic acid, and lipoxins, which play a crucial role in vascular physiology (Shahidi. F& Miraliakbari. H, 2004).

These eicosanoids are involved in several physiological actions, including pro/anti-inflammatory, pro/antiplatelet aggregatory, vasodilation, vasoconstriction, immune response, and cell growth and proliferation

Methodology

Selection of Area

The study was conducted in Union Territory of Puducherry once the original headquarters of the French in India. Puducherry was selected for the study based on convenience sampling as being the researcher's hometown. Puducherry was selected in order to identify the sample as the researcher has easy to access and could establish a good rapport and monitor the intake of Omega-3- Fatty Acids in adolescent subjects.

Collection of Data

We collect primary data during the course of doing experiments in an experimental research but in case we do research of the descriptive type and perform surveys, whether sample surveys or census surveys, then we can obtain primary data either through observation or through direct communication with respondents in one form or another or through personal interviews(https://southcampus.uok.edu.in/Files/Link/DownloadLink/RM%20U2%20P2.pdf).

The study was conducted at rural, semi-urban and Urban areas of Puducherry being the native place for the researcher. The data was collected for a period of three weeks by using the prepared tools. The data collection was done by using Google forms framing the questionnaire, as it was a lockdown period due to the COVID-19 pandemic situation and it was framed in English to the subjects, and in case of doubts, clarified through telephone interview.

Selection of Sample Size

Selection of sample based on purposive method a total of 170 subjects adolescent subjects, those who were willing to participate were selected as the sample. The study population includes subjects only women were chosen between age group 11-19 years to be studied for three weeks. The research comprises of survey and clinical diagnosis of the subjects. The preliminary questions

included general socio-economic status of the individual like Age, Gender, Area of the Respondent, Mother Tongue of the subjects, Religion, Educational qualifications, Occupation, Type of Family, Monthly income earned by Family members, and Marital Status of the respondents.

Anthropometric Measurements

Height

Height is the measurement of a length of the human body, from the bottom of the human body of the feet to the head when standing erect (www.answer.com).

The individuals were asked to make a marking on the wall and to measure their height Height was measured using a good measuring tape and was recorded to the nearest 0.1 centimetres.

Weight

A portable standard body weighing machine was used by the subjects to find out the weight of the individual samples. The respondents were made to stand with head straight and they were asked to wear clothing with less weight and the values were noted during the interview schedule.

Body Mass Index (BMI)

A BMI scale provides information about whether your body weight is appropriate for your height. The method involves considering your body weight in kilograms (Kgs) and height in meters and dividing the weight by square of the height.

Calculated BMI

Height was recorded using a stadiometer while, weighing scales were used to weigh the samples Body Mass Index (BMI) was calculated height and weight measurements.

Dietary Pattern

The intake of foods rich in Omega-3-Fatty Acids included Proteins, fish, seafoods such as Crustaceans, Nuts and Oilseeds, Fruits, Vegetables, Fortified foods and Additional Supplements.

Nutrition Education

The nutrition education explained through Google Meet on visual learning by the researcher to the subject about the intake of foods in general to be taken and the functions, benefits and recommended intake of Omega-3 rich foods to be taken naturally.

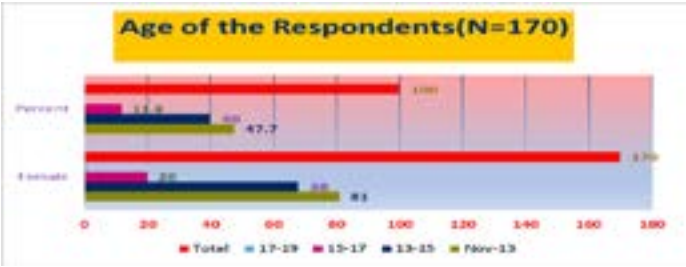
Result & Discussion

General Background

Socioeconomic Profile

Age of the Respondents

Age is the interval of time between the day, month and year of birth and the day and year of occurrence of the event expressed in the largest completed unit of solar time such as years for adult's months, week, days, hours or minutes of life, as appropriate, for infants under one year of age (Gregorian calendar) (Bocanegra A., & etal, 2009).



Majority 81(47.7 percent) were between the age group of 11-13 years, 68(40 percent) under the 13-15 years category, 20(11.8 percent) in 15-17 years age group and only 1(0.1 percent) under 17-19 years were found.

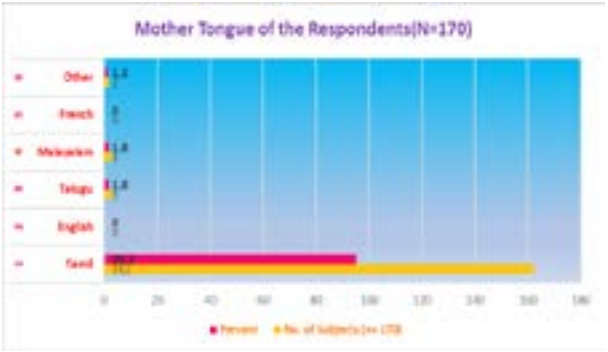
Religion of the Respondents

Religion is a cultural system of designated behaviours and practices, orals, sanctified places, prophecies, ethics, or to supematural, transcendental, or spiritual elements. However, there is no consensus over what precisely constitutes a religion (Schuchardt. JP et al., 2011).

Majority 91.2 percent of the subjects were found to be Hindus. This could be due to dominant population of Hindus in Puducherry Three percent each of the samples to Christian and Muslim minority category.

Mother Tongue of the Respondents

Mother tongue is a language system of designated behaviors and describes a persons of the Tamil, English, Telugu, Malayalam, French and other language are example of such status and sometimes may be a language.



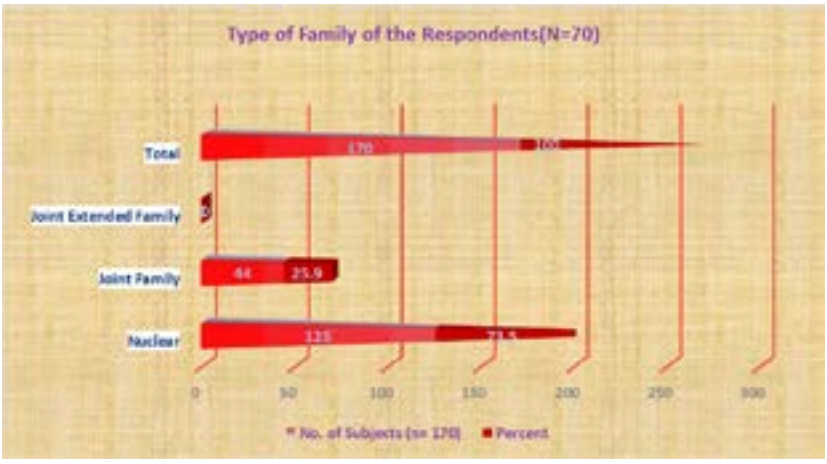
Majority 95.3 Percent (162) of the subjects were found to be Tamil. This could be due to dominant population were found to be Tamil from Puducherry, (3)1.8 percent spoke Telugu, (3)1.8 Percent of them were found to speak Malayalam, (2)1.2 percent to speak English, none from French though they come from the French ruled population Puducherry.

Total Monthly Income (Rs.) of the Family of Respondents

From the above Figure it is clear that, almost 44.1 Percent (24) of the subjects were found to earn between Rs.4000-8000 as total monthly income of family. 14.1 Percent (75) had total income Below Rs.4000 and 41.8 Percent (71), were found in the category of earning Above Rs.8000 total monthly income of the family in Puducherry.

Type of Family of the Respondents

It is obvious that 73.5 Percent (125) of the subjects were found to be in the Nuclear family category. This could be due to the floating population in Puducherry 25.9 Percent(44) of Joint family background for generations and 0.6 Percent(1) Joint extended family being minority category.



Educational Qualification of Family Members of the Respondents

S. No.	Educational Qualification of Family Members	No. of Subjects (n= 170)	Percent
1	School	102	60
2	Higher secondary	38	22.4
3	College / University	30	17.6
	Total	170	100

Majority of them 60 Percent (102) of the subjects were found to have finished studies at School Level. This could be due to the awareness on literacy rate in Puducherry, 22.4 Percent (38) of them had completed Higher Secondary education and 17.6 Percent (30) had underwent College or University Education.

Anthropometric Measurements

Height of the Respondents

The above graph reveals that 52(30.6 percent) falls in the 131-140 centimetre(cm) height category, 55(32.4 percent) between 111-120 cm category, 40(23.4 percent) in between 141-150 cm category, and 23(13.6 percent) in the 121-130 cm category as far as height of the individuals were concerned.

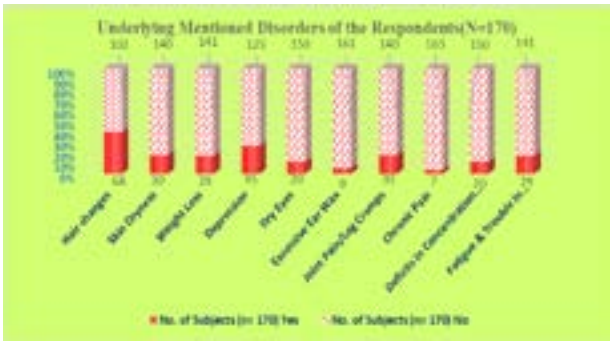
Weight of the Respondents

Majority 63(37.1 percent) in the 41-50 Kgs group, 55(32.4 percent) the 51-60 Kilograms weight group, 49(28.8 percent) in between 61-70 category group, 49(28.8 percent) falls in 71-80 Kgs category and 2(1.2 percent), 1(0.5 percent) respectively.

Body Mass Index (BMI) of the Respondents

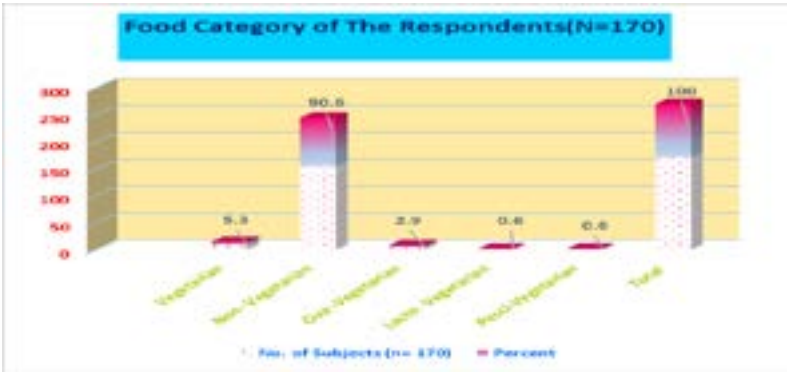
According to World Health Organisation[WHO](2020), 20(11.7 percent), belong to Underweight Category, 52(30.6 percent) in the Normal weight Category, 20(11.8 percent) were found to be Overweight, 15(8.9 percent) in Class I-Obesity, 43(25.3 percent) in the Class II- Obese Category and lastly, 20(11.7 percent) in the Class III Obesity Category, which can be due to sedentary Lifestyle.

Underlying Mentioned Disorders of the Respondents



From the above figure it is obvious that 68(40 percent) had changes in hair colour and thickness as well as growth, 30(17.7 percent) from dryness of skin, 29(1.8 percent) had weight loss not due to dieting,45(26.5 percent) from depression could be due to pandemic situation, to remain at home, 20(11.8 percent) from dryness of eyes had to consult an ophthalmologist for eye drops in some cases, 9(5.3 percent) had excessive ear wax had to clean frequently as they experienced irritation or itching, 30(17.7 percent) from Joint pain or leg cramps especially during menstruation, only 7(4.1 percent) had Chronic pain like migraine, or in the stomach, 20(11.8 percent) had deficits in concentration and lastly 29(17.1 percent) experienced fatigue at work or while studying and had trouble in sleeping.

Food Category



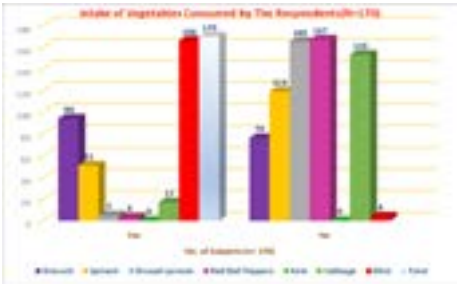
Majority 90.6 Percent (154) of the subjects were found to be Non-Vegetarian. 5.3 Percent(9) of them were Vegetarian, 2.9 Percent(5) were found to be Ova- Vegetarian, 0.6 Percent (1) of them were Lacto –Vegetarian and 0.6 Percent (1) of them under Pesci-Vegetarian category in the present study.

Vegetarian / Non-Vegetarian Foods

Majority 46.5 Percent (79) of the subjects were found to consume Weekly, 14.7 Percent(25) of them ingested Daily, 7.6 Percent(13) of them Monthly and 31.2 Percent(53) of them Twice in a week.

Intake of Vegetables Consumed by The Respondents

Eat the vegetables every day is important for health. They provide essential vitamins, minerals, and other nutrients, such as antioxidants and fibre rich foods in omega-3 fatty acids rich vegetables.

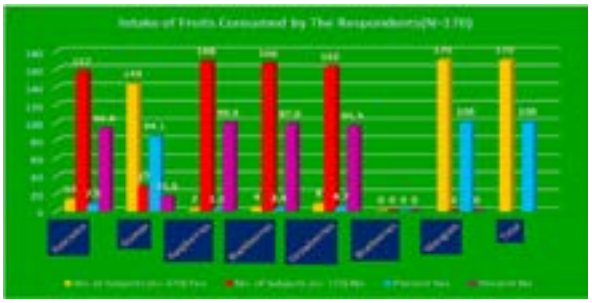


Majority 55.3(94) Percent of the subjects were found to take Broccoli. 30 Percent(51) of them took Spinach, 2.9 Percent(5) had taken Brussel sprouts, 1.8(3) Red Bell Peppers otherwise known as red chillies or capsicum and 10 percent (17) of them took Cabbage under Cruciferous Family of veggies, 97.64 percent (166) took mint in the form of chutney, kurma or biryani.

Intake of Pesci-Vegetarian Type of Foods

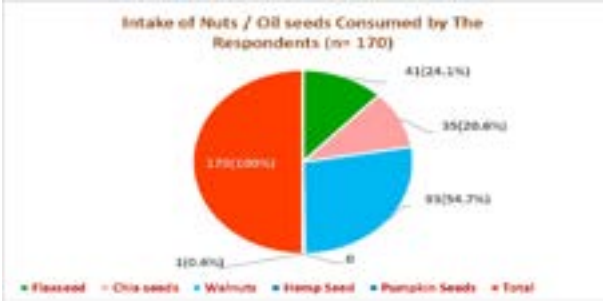
From the above graph it is clear that none of the subjects were found to consume Salmon found abroad and not found in India rich in omega-3- fatty acids and Vitamin D, Lake Trout, Halibut, and Sea Bass was also not consumed. 117(68.8 percent) of the Mackerel, 23(13.5 percent) Tuna, 5(2.9 percent) had taken Herring 20(11.8 percent) of the Sardines and 5(2.9 percent) Anchovies rich in calcium.

Intake of Fruits Consumed by the Respondents



Majority 143(84.1 percent) of the subjects were found to have Guavas rich in Vitamin C enhancing immunity power and eases digestibility. 13(7.6 percent) of them had Avacados, 2(1.2 percent) Raspberries, 4(2.4 percent) enjoyed taking Blackberries in pastries or bakery items and 8(4.7 percent) of them had Strawberries in the form of juice or ice creams, none of them had blackberries, all of them had mangoes the seasonal fruit.

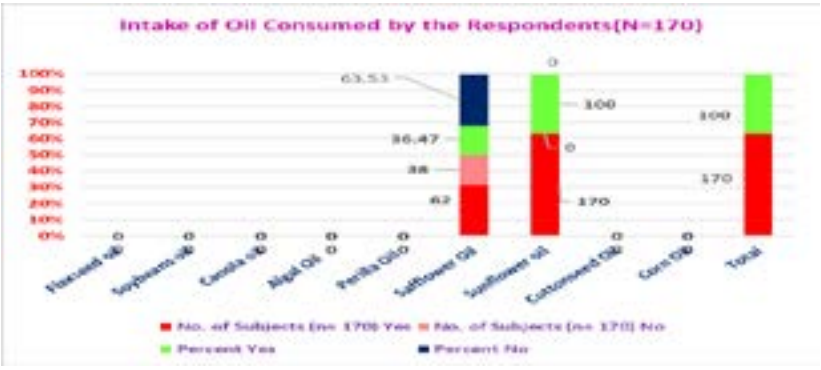
4.2.10 Intake of Nuts / Oil seeds Consumed by the Respondents



Majority 93(54.7 percent) of the subjects were found to consume Walnuts. This could be due to dominant population who have passion for Walnuts residing in Puducherry, 41(24.1 percent) of them had Flaxseed, 35(20.6 percent) consumed Chia seeds as salads, and 1(0.6 percent) of them had Hemp Seed, minority category found in the study at Puducherry.

Intake of Oil used in Cooking By The Respondents

Cooking oil is plants, animals, or synthetic fat used in frying, baking, and other types of cooking. It is also used in food preparation and flavouring not involving hat, such as salad dressings and bread dipping like bread dips, and may be called edible oil.



None of them consumed Flaxseed oil, Soybean oil, Canola oil, Algal oil, Perilla Oil, Cottonseed oil, Corn oil and rarely 62(36.47 percent) consumed Safflower oil and 100 percent (170) used Sunflower oil for cooking purpose in the form of seasoning and in shallow or deep fat frying.

Conclusion

A general recommendation is to follow a dietary pattern predominantly based on whole foods (i.e., fruits and vegetables, whole grains, nuts, seeds, legumes, other dietary fibre sources, PUFA-rich seafood) with a relatively lower intake of energy dense processed and fried foods, and sugar sweetened beverages; and to avoid consumption of large portion sizes. Moderate consumption of dairy products and lean meats and poultry can also be an important part of recommended food-based dietary guidelines. Maintaining recommended dietary patterns, appropriate energy intake and adequate physical activity levels are critical to prevent unhealthy weight levels (e.g. overweight and obesity) and to ensure optimal health for those predisposed to insulin resistance.

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