



A STUDY ON KNOWLEDGE, APTITUDE AND PRACTICE REGARDING CONSUMPTION OF FATS AND OILS IN WOMEN OF MUMBAI CITY

Dr. Rekha Battalwar¹ | Jinal Pasad²

¹Associate Professor, Department of Food, Nutrition & Dietetics, Sir Vithaldas Thackersey College of Home Science (Autonomous), S.N.D.T. Women's University, Mumbai, India, 400049.

²Student, Post Graduate Diploma in Clinical Nutrition & Dietetics, Department of Food, Nutrition & Dietetics, Sir Vithaldas Thackersey College of Home Science (Autonomous), S.N.D.T. Women's University, Mumbai, India, 400049.

ABSTRACT

Fats and oils form the base of Indian cooking and there has been a lot of advancement in the edible oil industry from introduction of olive oil to addition of Oryzanol to Rice bran oil and the newly blended oils available in the market in the last decade. The KAP study was performed with a view to generate information of the knowledge, aptitude and awareness of the consumption of dietary fats and oils of women in the city of Mumbai with the increase in literacy and growing awareness of newly introduced fats and oils in the market and its consumption.

Aim: To study the influence of age or type of family on knowledge and practice regarding consumption of fats and oils in women

Method: A cross-sectional study was conducted in 70 women aged 21-60 years from Mumbai city. Women were divided according to age (≤ 40 years and ≥ 41 years) or type of family (joint or nuclear) for comparison. Analyses were performed using SPSS software for Windows (version 16.0, 2007, SPSS Inc, Chicago, IL). The frequency distributions were tabulated for various parameters by age or type of family and were compared using cross tabulations and chi-square test P-value < 0.05 was considered to be statistically significant.

Results: Out of the total subject size of 70 women, a significantly higher percentage of women from joint family reported that sesame oil ($\chi^2=6.471$), mustard oil ($\chi^2=3.962$) and butter ($\chi^2=3.873$) is healthy as compared to women from nuclear family ($p<0.05$). A significant association of reusing oil for shallow frying was found with type of family with higher percentage of women from joint family always reusing oil for shallow frying as compared to women from nuclear family ($\chi^2=7.708$, $p<0.05$). A significant association of age with type of olive oil that is good was found with significantly higher percentage of women aged ≥ 41 years reporting that extra-virgin olive oil is better as compared to Pomace ($\chi^2=6.200$, $p<0.05$).

Conclusion: Type of family had a more influence on the knowledge and practice regarding consumption of fats and oil. Even age influenced the knowledge and practice regarding consumption of fats and oil. Public awareness camps need to be organized to increase awareness regarding healthy fats and oil consumption patterns in the community.

Keywords: Dietary Fats, Oils, MUFA, N-3 PUFA, N-6 PUFA, Saturated Fatty Acid, Trans Fats, Health And Disease.

Introduction:

Fats consist of a wide group of compounds that are soluble in organic solvents and insoluble in water. They have lower densities than water and at normal room temperature range in consistency from liquids to solids, depending on their structure and composition. Although the words "Oils", "Fats" and "Lipids" are all used to refer to fats, "Oils" are used to refer to fats that are liquids at room temperature, "Lipids" are used to refer to both liquid and solid fat.

A number of studies over the years have proved that increase in intake of dietary fat especially saturated fats and trans fats and lower intake of PUFA, MUFA and essential fatty acids (omega-3 fatty acid & Omega-6 fatty acid) increase the risk to cancer, Coronary Heart diseases, obesity and diabetes (Jun Han et al, 2015; Qianyi Wang et al, 2016;

Patricia Casas-Agustench et al, 2014 and Katherine Bowers et al, 2012 respectively). A study conducted in 2014 proved that the consumption of Extra Virgin Olive Oil illustrated significant anti-osteoporosis, antioxidant, anti-inflammatory,

and anticancer properties in vivo by significantly increasing Bone mass density and decreasing phosphatase, alkaline phosphatase, IL-6, MDA, and nitrate levels (Huilan Liu and Huijuan Huang et al). Sesame oil or Til Oil that is widely used in India has a variety of benefits especially those of antinociceptive and anti-inflammatory due to "Sesamin" which is one of the active constituents of sesame oil and represents a promising target for the treatment of pain and inflammation by inhibiting the formation of prostaglandins and leukotrienes from arachidonic acid (Karatzi Kalliopi and Stamatelopoulos Kimon et al, 2013). In this study A study done in Philippines showed that coconut oil consumption lowers lipid profile in pre-menopausal women as coconut oil did not elevate TC, triglyceride levels and TC/HDL ratio. Also, Dietary coconut oil intake was positively associated with HDL-c levels. On Virgin coconut oil supplementation during chemotherapy there was an improvement in the functional status and global Quality of life of breast cancer patients. In addition to it, it reduced the symptoms related to side effects of chemotherapy (Alan B. Feranil and Paulita L. Duazo et al, 2011). Ghee has been traditionally used in Indian homes since ancient times, a study

conducted in 2010 stated that the beneficial effects of ghee, including dose-dependent decreases in serum total cholesterol, low density lipoprotein (LDL), very low density lipoprotein (VLDL), and triglycerides; decreased liver total cholesterol, triglycerides, and cholesterol esters; and a lower level of nonenzymatic-induced lipid peroxidation in liver homogenate. Similar results were seen with heated (oxidized) ghee which contains cholesterol oxidation products (Hari Sharma and Xiaoying Zhang et al,2010). Canola oil too has health benefits and effects of canola oil consumption protects against coronary heart disease, insulin sensitivity, lipid peroxidation, inflammation, energy metabolism, and cancer cell growth. Data reveal substantial reductions in total cholesterol and low-density lipoprotein cholesterol, as well as other positive actions, including increased tocopherol levels and improved insulin sensitivity, compared with consumption of other dietary fat sources(Lin Lin and Hanja Allemekinders et al,2013). In summary, growing scientific evidence supports the use of canola oil, beyond its beneficial actions on circulating lipid levels, as a health-promoting component of the diet. However, certain oils when consumed on a higher rate are unhealthy, like a study done in 2013 stated that Palm oil contains approximately 49 g saturated fat per 100 g oil, as opposed to 17 g in peanut oil, 16 g in soybean oil, and 7 g in canola/rapeseed oil. Consequently, palm oil induces a larger increase in plasma concentrations of total cholesterol and low density lipoproteins. Palm oil consumption is strongly associated with higher rates of death from myocardial infarction in low and middle income countries, even after adjustment for time trends, tobacco use, and other saturated fat sources(Sanjay Basu and Kim S Babiarz et al,2013). Blended Oils have set a new trend in the Indian markets. A study conducted in 2015 showed that the blend of Rice Bran Oil and Sunflower oil(70:30) with antioxidant technology along with other lifestyle changes helps lowering of blood lipids and stated inflammatory biomarkers and thus, in turn may help prevent lifestyle diseases (C. J. Devaraju and Shashank R. Joshi et al,2015).

According to The National Institute Of Nutrition, India (2011) nutritional guidelines state that the total fat (visible + invisible) in the diet should provide between 20-30% of total calories. The visible fat intake in the diets can go up to 50g/person/day based on the level of physical activity and physiological status. Adults with sedentary lifestyle should consume about 25 g of visible fat, while individuals involved in hard physical work require 30 - 40g of visible fat. Visible fat intake should be increased during pregnancy and lactation to 30g. The higher fat and EFA requirements during pregnancy and lactation are to meet the requirements of foetus and young infants, in view of their crucial role in physical and neuronal growth and development. Diets of young children and adolescents should contain about 30-50g of dietary fat per day.

This KAP study was conducted with a view to study the knowledge, aptitude and practice of consumption and method of utilization of fats and oils consumed in the city of Mumbai so as to help increase awareness of ill-effects of consumption of saturated fats and trans fats and through light of intake of essential fatty acids, PUFA and MUFA that aid in prevention of diseases.

Aim: To study the influence of age or type of family on knowledge and practice regarding consumption of fats and oils in women

Methods: A detailed Knowledge Aptitude and Practice study was conducted through an online questionnaire where the subjects were supposed to answer initially a few general questions related to their gender, age occupation and economic status. After a few general questions they were asked a few questions on their knowledge on dietary fats like which oil is the most healthy for consumption, would changing the quality of fat in diet help improve the quality of life and also a few detailed questions of their knowledge on trans fat, cholesterol and the daily average requirement of dietary fats for an individual. Also questions like after using fat for frying what would they do with the leftover fat were included to judge their knowledge on oxidation of fats.

The online questionnaire was administered to women between the age of 21-60yrs who were literate, as they would be able to answer the questions effectively as they themselves would make monthly purchases of fat and also regularly cook. Women who actively participated were included in the study. Exclusion Criteria of the study were men and all women with food and nutrition background to prevent any bias.

A cross-sectional study was conducted in 70 women aged 21-60 years from Mumbai city. A structure questionnaire was used to collect information regarding which oil women perceived to be healthy, knowledge regarding olive oil, practice regarding use of blended oils and reusing oil after deep frying. Women were divided according to age (≤ 40 years and ≥ 41 years) or type of family (joint or nuclear) for comparison.

Statistical Methods:

Analyses were performed using SPSS software for Windows (version 16.0, 2007, SPSS Inc, Chicago, IL). Data are presented as percentage. The frequency distributions were tabulated for various parameters by age or type of family and were compared using cross tabulations and chi-square test P-value < 0.05 was considered to be statistically significant.

Results:

Data on 70 women aged 38.5 ± 11.6 years is presented in the current study. Of the 70 women, 36 (51.4%) were aged 40 years and less whereas 34 (48.6%) women were aged 41 years and more; and 44.1% women belonged to joint family and 55.9% belonged to nuclear family.

Fats and Health Benefits:

All women in the study reported that selecting the right oil improves health and 58 (82.9 %) reported that less oil consumption translated to less dietary fat intake. Lesser percentage of women ≤ 40 years (80%) reported that less oil consumption translated to less dietary fat intake as compared women ≥ 41 years (90.9%), however this difference was not significant ($\chi^2=0.165$, $p=0.685$). There was no significant difference in the percentage of women ≤ 40 years (83.3%) and ≥ 41 years (86.8%) reporting that less oil consumption translated to less dietary fat intake ($\chi^2=0.165$, $p=0.685$).

Out of the 70 women, 55.1% reported sunflower oil, 11.6% reported safflower oil, 24.6% reported groundnut oil, 18.8% reported coconut oil, 1.4% reported palmolein oil, 20.3% reported sesame oil, 72.5% reported olive oil, 55.7% reported rice bran oil, 15.9% reported soybean oil, 8.7% reported mustard oil, 10.1% reported fish oil, 39.1% reported ghee, 5.8% reported vanspati or dalda, 4.3% reported butter and 5.8% reported margarine to be healthy. **Table 1** provides percentage of women reporting a particular oil to be healthy when classified according to age or type of family. As seen in **Table 1**, significantly higher percentage of women from joint family reported that sesame oil, mustard oil and butter is healthy as compared to women from nuclear family ($p < 0.05$). There was no significant difference in percentage of women reporting other oils to be healthy when classified according to age or type of family.

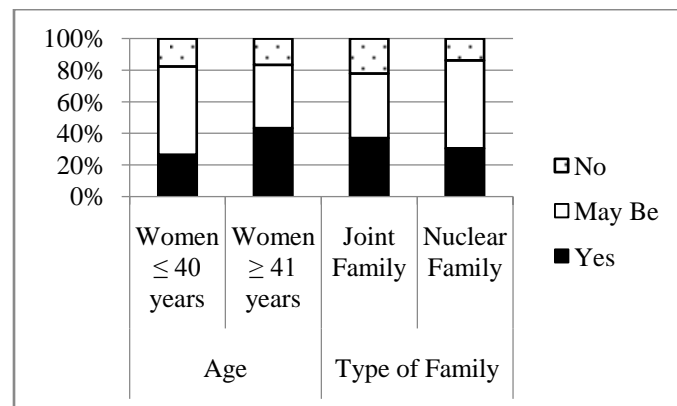
Table 1: Percentage of women reporting particular oil to be healthy when classified according to age or type of family

	Age			Type of family		
	Women ≤40 years	Women ≥41 years	χ ² (p value)	Joint family	Nuclear Family	χ ² (p value)
Sunflower oil	57.1	52.9	0.123 (0.726)	63.3	45.9	2.015 (0.156)
Safflower oil	14.3	8.8	0.502 (0.479)	13.3	10.8	0.100 (0.752)
Groundnut oil	22.9	26.5	0.121 (0.728)	20.0	27	0.405 (0.502)
Coconut oil	11.4	26.5	2.552 (0.110)	20.0	16.2	0.161 (0.688)
Palmolein oil	2.9	0.0	0.986 (0.321)	0.0	2.7	0.823 (0.364)
Sesame oil	11.4	29.4	3.449 (0.063)	33.3	8.1	6.471 (0.009)
Olive oil	80.0	64.7	2.022 (0.155)	80	67.6	1.303 (0.254)
Rice bran oil	51.4	61.8	0.750 (0.387)	53.3	62.2	0.531 (0.466)
Soybean oil	20	11.8	0.873 (0.350)	13.3	18.9	0.377 (0.539)
Mustard oil	2.9	14.7	3.050 (0.081)	16.7	2.7	3.962 (0.047)
Fish oil	8.6	11.8	0.193 (0.660)	13.3	8.1	0.483 (0.487)
Ghee	34.3	44.1	0.700 (0.403)	33.3	43.2	0.685 (0.408)
Vanspati/ Dalda	8.6	2.9	1.001 (0.317)	0.0	10.8	3.449 (0.063)
Butter	2.9	5.9	0.380 (0.538)	10	0.0	3.873 (0.049)
Margarine	2.9	8.8	1.124 (0.289)	3.3	2.7	0.023 (0.880)

Data presented as percentage

From the 70 women, 34.4% reported that fats and oils provide other nutrients other than energy, 48.4% reported that may be fats and oils provide other nutrients other than energy whereas 17.2% reported that fats and oils do not provide other nutrients other than energy. **Figure 1** presents the percentage of women reporting that fats provide other nutrients as than energy when classified according to age or type of family. There was no significant association of age ($\chi^2=2.157$, $p=0.34$) and type of family ($\chi^2=1.469$, $p=0.473$) with percentage of women reporting that fats provide other nutrients other than energy (**Figure 1**)

Figure 1: Percentage of women reporting that fats provide other nutrients as than energy when classified according to age or type of family



Data presented as percentage

Awareness about olive oil:

Of the 70 women, 7.4% reported that Pomace olive oil is healthy, 74.1% said extra virgin olive oil is healthy and 18.5% reported that both olive oil are healthy. Of the 70 women, 32.8% reported that olive oil is good for deep frying. **Table 2** gives awareness about olive oil when classified according to age or type of family. As seen in **Table 2**, there was a significant association of age with type of olive oil that is good with significantly higher percentage of women aged ≥41 years reporting that extra-virgin olive oil is better as compared to Pomace ($p < 0.05$). No other association of age or type of family with awareness regarding olive oil was observed ($p > 0.05$) (**Table 2**).

Table 2: Awareness about olive oil in women when classified according to age or type of family

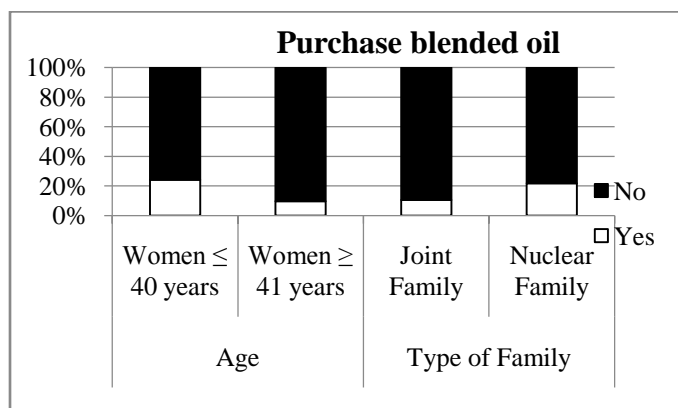
	Women ≤40 years	Women ≥41 years	χ ² (p value)	Joint family	Nuclear Family	χ ² (p value)
Which olive oil is good						
Pomace	11.1	3.7	6.200 (0.045)	4.3	10	0.729 (0.694)
Extra – virgin	59.3	88.9		73.9	73.3	
Both	29.6	7.4		21.7	16.7	
Is olive oil good for frying						
Yes	45.4	16.7	6.010 (0.014)	22.2	37.1	1.597 (0.206)
No	54.5	83.3		77.8	62.9	

Data presented as percentage

Practice regarding use of blended of oils:

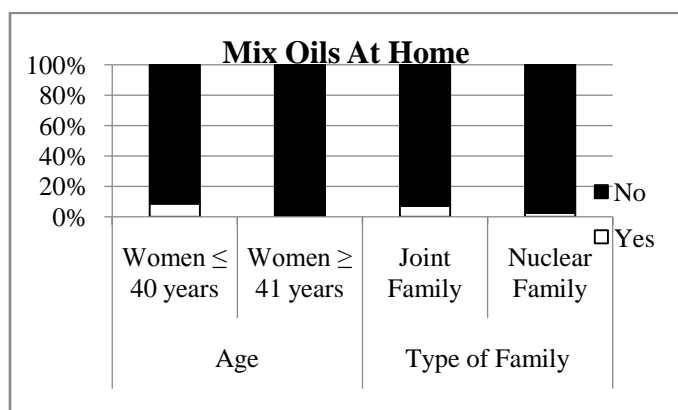
Of the 70 women, 15.2% purchased blended oils always, 9.1% purchased blended oils sometimes and 75.8% did not purchase blended oils. On the other hand, 4.5% mixed oils at home and stored whereas 95.5% did not blend oils at home and store. As seen in **Figure 2**, there was no significant difference in the percentage of women purchasing blended oils when classified according to age ($\chi^2=4.931$, $p=0.085$) or type of family ($\chi^2=3.346$, $p=0.188$). Similarly there was no significant difference in the percentage of women mixing oils at home and storing when classified according to age ($\chi^2=2.871$, $p=0.090$) or type of family ($\chi^2=0.756$, $p=0.385$) (**Figure 3**).

Figure 2: Percentage of women purchasing blended oils when classified according to age or type of family



Data presented as percentage

Figure 3: Percentage of women purchasing mixing oils at home when classified according to age or type of family



Data presented as percentage

Practice regarding reusing oil after deep frying:

Of the 70 women, 20.3% women throw away the oil after deep frying, 45.3% reuse oil immediately after deep frying and 34.4% store oil for further use after deep frying. 14.5% women reused oil for deep drying always, 35.5% reused oil for deep frying sometimes and 50% never reused oil for deep frying. On the other hand, 32.3% reused oil for shallow frying, 40.3% reused oil for shallow frying sometimes and 27.4% never reused oil for shallow frying. Table 3 gives practice regarding re-using oils when classified according to age or type of family. As seen in Table 3, there was a significant association of reusing oil for shallow frying and type of family with higher percentage of women from joint family always reusing oil for shallow frying as compared to women from nuclear family ($p < 0.05$). There was no other association of reusing oil with either age or type of family ($p > 0.05$) (Table 3).

Table 3: Practice regarding reusing oil after deep frying in women when classified according to age or type of family

	Women ≤40 years	Women ≥41 years	χ^2 (p value)	Joint family	Nuclear Family	χ^2 (p value)
What do you of oil after deep frying						
Throw it away	20.6	20	1.781 (0.411)	28.6	13.9	2.143 (0.343)

Reuse it immediately	38.2	53.3		39.3	50	
Store for further use	41.2	26.7		32.1	36.1	
Reuse oil for deep frying						
Always	19.4	9.7	4.716 (0.095)	7.1	21.2	3.653 (0.161)
Sometime	22.6	48.4		46.4	27.3	
Never	58.1	41.9		46.4	51.5	
Reuse oil for shallow frying						
Always	20	43.8	5.160 (0.076)	48.1	20.6	7.708 (0.021)
Sometimes	26.7	28.1		40.7	41.2	
Never	53.3	28.1		11.1	38.2	

Data presented as percentage

From the 70 women, 34.4% reported that fats and oils provide other nutrients other than energy; 7.4% reported that Pomace olive oil is healthy, 74.1% said extra virgin olive oil is healthy and 18.5% reported that both olive oil are healthy; 15.2% purchased blended oils always, 9.1% purchased blended oils sometimes and 4.5% mixed oils at home and stored; 20.3% women throw away the oil after deep frying, 45.3% reuse oil immediately after deep frying and 34.4% store oil for further use after deep frying; 14.5% women reused oil for deep frying always and 32.3% reused oil for shallow frying. Significantly higher percentage of women from joint family reported that sesame oil ($\chi^2=6.471$), mustard oil ($\chi^2=3.962$) and butter ($\chi^2=3.873$) is healthy as compared to women from nuclear family ($p < 0.05$). A significant association of reusing oil for shallow frying was found with type of family with higher percentage of women from joint family always reusing oil for shallow frying as compared to women from nuclear family ($\chi^2=7.708, p < 0.05$). A significant association of age with type of olive oil that is good was found with significantly higher percentage of women aged ≥ 41 years reporting that extra-virgin olive oil is better as compared to Pomace ($\chi^2=6.200, p < 0.05$).

Conclusion: Type of family had a more influence on the knowledge and practice regarding consumption of fats and oil. Even age influenced the knowledge and practice regarding consumption of fats and oil. Public awareness camps need to be organized to increase awareness regarding healthy fats and oil consumption patterns in the community.

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