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The type and amount of household oil consumption and the influential factors in Sanandaj city, Iran

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ABSTRACT

Cooking oils are among the most important dietary components. Some of the influential factors in the combustion pattern of cooking oils include the mode of cooking, knowledge of the diseases caused by cooking oils, and price of cooking oils. This cross-sectional, descriptive-analytical study was conducted in the winter of 2018. The research units were selected via simple random sampling. The sample size was calculated to be 460 cases using the formula for the estimation of the sample size in cross-sectional studies at the confidence level of 95%, error rate of 5%, and prevalence of 50%, considering the samples loss of 15%. The variables were measured via interviews and recorded in questionnaires. Data analysis was performed in SPSS version 20. In total, 400 households were surveyed. Mean age of the mothers was 34.01±5.85 years (age range: 19-58 years). Among the households, 19.5% used solid oils, 16.25% consumed liquid oils, 52% used both solid and liquid oils, 10.5% consumed vegetable oils (e.g., olive oil and sesame oil), and 1.75% used animal oils. The mean oil consumption per household was 149.2925 g/day, and the mean daily consumption per person was 39.6927 g. Moreover, 77.75% of the households discarded the used cooking oil and did not store/reuse the oil. On the other hand, 34.5% of the households consumed fast food twice per week. Market solid and liquid oils accounted for the highest consumption rate in the investigated households, while plant and animal oils constituted the lowest consumption rate.

Keywords: Edible Oil, Consumption pattern, Oil consumption, Household

Introduction

Nutrition is a significant parameter affecting health. Proper nutrition and use of foods could prevent disease, whereas inappropriate patterns of food consumption and using unhealthy food could cause various diseases. Lack of attention to proper nutritional patterns is considered to be a major issue in many countries across the world, as well as the subsequent illnesses, such as diabetes, obesity, and cancer. Cooking oils are among the most important dietary components, which are used in most foods and may cause numerous diseases. However, the optimal use of cooking oils could prevent several prevalent diseases.[1, 2] Currently, cardiovascular diseases are considered to be the major causes of disability and mortality. The prevalence of these diseases has reached 45% in some countries, and the associated mortality rate has been estimated at 30%.

In Iran, cardiovascular diseases are among the most important factors affecting the life of individuals,[1] while they have been reported to be the most prevalent cause of mortality in Iran. According to statistics, the mortality rate of cardiovascular diseases is 46%. One of the significant causes of cardiovascular diseases is unhealthy dietary habits, followed by the high consumption of trans fats.[1, 3]

Evaluation of households in terms of the consumption of oils and fats plays a pivotal role in predicting the health status of the community. More than 90% of the composition of edible oils is triglycerides, and the type of fatty acids in

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these oils remarkably influences the health of the consumers.[2] Several studies have denoted the high consumption of solid oils in Iran.[4] Furthermore, statistics have indicated that 84% of the oils in Iranian households are used for cooking, and about 71% of the cooking oils consumed for frying have been solid vegetable oils during the past years. With the current changes in the taste and culture, the consumption of solid cooking oils has reached 55%.[1]

Solid oils contain saturated fatty acids and trans fatty acids, both of which have been shown to increase cholesterol.[5] Improper nutrition (e.g., high consumption of oils), obesity, and genetic factors are associated with various health issues, such as increased cholesterol, production of atheroma plaques, and stenosis in the arteries, as well as symptoms such as angina, myocardial infarction, and stroke.[6, 7]

In a study in this regard, Pasdar et al. investigated the model of consuming various oils and the influential factors in their selection in the households in Kermanshah city (Iran). The mentioned research was conducted on 500 households in Kermanshah, and the samples were selected via multistage cluster sampling from six regions. The data were collected using a demographic questionnaire and a questionnaire of various types of edible oils via interviews with the participants. In addition, the mean daily consumption of edible oils in each household was estimated at 69.75±3.8 grams, and solid oils accounted for more than half of the consumed amount (2.27±34.7 g/d). The share of the energy obtained from the total oils was 31.4% daily calories, 15.6% of which was provided from solid oils. The obtained value was significantly higher compared to the recommended standard (maximum: 10%).[2]

Another research in this regard was performed in Iran on 15 hydrogenated oil samples in the Iranian market, all of which contained high levels of trans fatty acids. Total saturated and trans fatty acids in solid oils was estimated at 59%, while it was more than 70% in some of the samples.[8] Moreover, the findings of Mozaffarian et al. have indicated that the consumption of trans fatty acids in Iran is roughly twice as high as developed countries, such as the United States.[9] It is notable that the consumption rate of synthetic fatty acids is high in many communities, including developing countries. In developed countries, solid vegetable oils are used for cooking, baking breads and sweets, and producing processed foods.[10]

Some of the influential factors in the consumption pattern of cooking oils include the mode of cooking, knowledge of the diseases caused by cooking oil combustion, and price of the cooking oils. Individuals with different social systems and cultures have different food intake. Some of the factors that may prevent sufficient food intake are poor economic status, lack of proper food supply facilities, and cultural and political factors.[11, 12] Therefore, the first step in reforming these consumption patterns is to reduce the consumption of solid oils through raising awareness, promoting the use of liquid oils, and cross-sectoral coordination in order to increase access to these types of oil, change the lifestyle, and improve the quality of cooking oils.[1]

The present study aimed to evaluate the patterns of oil consumption in the households in Sanandaj city and the influential factors in their consumption pattern. It is hoped that our findings provide adequate information regarding dietary habits for the healthcare decision-makers in Iran.

Materials and Methods

This cross-sectional, descriptive-analytical study was conducted in the winter of 2018. The sample population included all the households in Sanandaj city, Iran. In order to access the households, the women were selected from the referrals to the health centers in Sanandaj since women are better informed on the nutritional status of their family members.

The research units were selected via simple random sampling. The sample size was calculated to be 400 cases using the formula for the estimation of sample size in cross-sectional studies at the confidence level of 95%, error rate of 5%, and prevalence of 50%, with the estimated sample loss of 15%. The final sample

size was determined to be 460. The studied variables included the age of the head of the households, type of consumed oil, amount of consumed oil, employment status of the mother, education level of the head of the household, income of the head of the household, frequency of oil consumption, amount of consumed oil in fast foods, and residence status (ownership/rental). The variables were obtained via interviews and recorded in questionnaires.

In total, 20 health centers were selected from 30 county health centers, and 23 questionnaires were completed and collected in each center. The required data were also collected using a researcher-made questionnaire. The questionnaire consisted of 23 items on demographic data and objectives of the research. The reliability of the questionnaire was verified by examining a sample of 100

households in Sanandaj.

Data analysis was performed in SPSS version 20 using the Kolmogorov-Smirnov test to determine the normal distribution of the data, nonparametric tests (Mann-Whitney U test and Kruskal-Wallis test), and correlational tests.

Results and Discussion

Out of 460 questionnaires and with the sample loss of approximately 60 (15%), 400 questionnaires with the correct answers were collected and analyzed. Mean age of the mothers was 34.01±5.85 years (age range: 19-58 years). The selected households were classified in terms of education level, employment status of the mothers, income status, household size, type of consumed cooking oil, home ownership, and frequency of oil combustion and fast food combustion per week (Table 1).

Table 1. Classified factors associated with consumption patterns of edible oils

Variable	Variable level	Frequency	Percentage
Education head of household	Uneducated	56	14
	High School, no degree	79	19.75
	Diploma degree	130	32.5
	University degree	102	25.5
	Master and doctorate degree	33	8.25
Mother's household job	Employed	112	28
	House keeper	288	72
Income	Low	28	7
	Medium	227	56.75
	High	145	36.25
Household size (person)	2 person	66	16.5
	3 person	139	34.75
	4 person	118	29.5
	5 person	62	15.5
	6 person	10	2.5
	7 person	3	0.75
	8 person	2	0.5
Oil type	Solid	78	19.5
	Liquid	65	16.25
	Solid and liquid	208	52
	Vegetable	42	10.5
	Animal	7	1.75
Home ownership	Rental	124	31
	personal	276	69
Oil reuse	Non-reuse	311	77.75
	Reuse	89	22.25
Use fast food (Number per week)	Non-use	26	6.5
	Once	102	25.5
	Twice	138	34.5
	3 times	77	19.25
	4 times	45	11.25
	5 times	9	2.25
	6 times	3	0.75

The maximum, minimum, and mean consumed oil per household and individual are presented in Table 2. The correlations between the type and amount of the consumed oil with the education level, employment status

of the mothers, income status, household size, type of oil, home ownership, oil reuse, and frequency of fast food consumption per week are shown in Table 3.

Table 2. Amount of consumed oil per household and household members in 24 hours

Variable	Minimum	Maximum	Average	Std. Deviation
Oil consumed by household (gr)	24.2500	489.500	149.2925	78.3254
Oil consumed by individual (gr)	12.1250	75.7000	39.6927	21.4528

Table 3. Correlations of type of oils and influential factors

Type of oil consumed	Value	df	Sig.
Education level	266.000	40	p<0.05
Mother's job	124.000	10	p<0.05
income	160.000	20	p<0.05
Household size	171.000	60	p<0.05
Home ownership	14.000	10	p<0.05
Oil reuse	29.000	10	p<0.05
Number of fast food per a week	102.000	60	p<0.05

Table 4. Correlations of household oil consumption and influential factors

The amount oil consumed by household	df	Sig.	N
Education level	4	p<0.05	400
Mother's job	Z= -3.000	p<0.05	400
Income	2	p>0.05	400
Household size	5	p<0.05	400
Home ownership	Z=0.000	p<0.05	400
Oil reuse	Z= -1.060	p<0.05	400
Number of fast food per a week	5	p<0.05	400
Type of oil consumed	3	p<0.05	400

According to the information in Table 1, the education level of the majority of the heads of the selected households was high school diploma (32.5%), while the minority had PhD or master's degree (8.25%). Moreover, the majority of the women referring to the selected health centers (72%) were housewives. The majority of the households (56.75%) had moderate income (1,700,000-2,300,000 Tomans). Approximately 34.75% of the housewives had a dimension of 3 people. 52% of the households used a combination of solid and liquid oils, while animal oils were consumed least frequently (1.75%). Additionally, 69% of the households were owned properties. According to the findings, 77.75% of the households in Sanandaj disposed of used oil and did not store or reuse the cooking oil. Moreover, 34.5% of the households used

fast foods twice per week.

In a study by Jafari et al., the majority of the participants had high school diploma (or lower degrees) and were housewives. In the mentioned study, the most commonly consumed cooking oils were liquid and solid oils. This is consistent with the results of the present study.[1] In the current research, the consumption of solid oil was higher compared to liquid oil. Meanwhile, Majdi et al. reported that more than 80% of the consumed cooking oils were solid, followed by liquid oils.[13]

According to the information in Table 2, the mean oil consumption per household was 149.2925 grams, and the mean oil consumption per individual was 39.6927 grams in 24 hours. In a study by Pasdar et al., the mean daily consumption of edible oils in each household was reported to be 69.75±3.8 grams.[2] In another

research in Kermanshah (Iran), the mean oil and fat consumption per person was 42 grams in 24 hours.[14]

According to the information in Table 3, there were significant correlations between the type of the consumed oils and various influential factors, including the education level, employment status of the mother, income status, household size, home ownership, frequency of consumed oil, and frequency of fast food consumption per week ($P<0.05$).

In the present study, use of olive and sesame oils was higher in the low-population households compared to the populated households. This could be due to the high cost of these oils, which increases the household food costs by increasing the household size. Therefore, populated households were observed to consume solid or liquid oils or a mixture of both more frequently. According to the current research, the consumption of vegetable oils in the high-income households was higher compared to the low-income households, and the latter used more solid and liquid oils comparatively. Furthermore, vegetable oils (e.g., sesame and olive oils) were more frequently found in the food basket of employed women, while housewives used solid and liquid oils more frequently.

In the present study, the households with higher education level used sesame and olive oils more commonly compared to the families with low education levels. Moreover, the use of sesame and olive oils was higher in the owned households compared to the rentals. The number of the households that reused or kept the used oil was significantly lower than the households who used the cooking oil only once. In the households where the cooking oils were reused, the highest consumption rate belonged to solid and liquid oils, while vegetable oils were consumed less frequently. On the other hand, the consumption of vegetable oils was higher in the households using less fast food compared to the other households. This finding could be due to the fact that the households that consumed less fast food were more likely to care for the health of the family and used vegetable oils instead of solid and liquid oils.

According to the information in Table 4, there were significant correlations between the amount of the consumed oil by the households and education level, employment status of the mother, household size, home ownership, reuse of oils, and frequent use of fast food per week. However, no significant association was observed between the oil consumption and household income.

In the present study, increased household size was associated with the higher consumption of oil per individual, which could be attributed to more waste of oil in populated families, so that in populated households, the amount of oil remaining in the frying dish to be disposed would be more than low-populated households. Moreover, the amount of oil consumed by housewives was higher than employed women, which can be attributed to the inability of employed women to cook often.

The consumed amount of oil in the household heads with higher education levels was lower compared to the households with lower education levels. Moreover, the consumed amount of oil in the households of the homeowners was higher compared to tenants, which could be attributed to higher economic status and consumption of oil per household. The consumed oil in households who would reuse oil was lower comparatively, which was due to the reuse of oil, resulting in lower oil consumption.

With the increased rate of fast food consumption per week, the amount of consumed oil decreased, which could be attributed to the use of fast food instead of home-made food. According to our findings, the consumed amount of vegetable oil was lower than solid and liquid oils since vegetable oils are mainly based on sesame and olive, which are costly and can be reused. In a study by Jafari et al., the association between the type of consumed oil and the household size, occupation status of the mothers, and education level of the family head were significant as well.[1]

According to the study by Pasdar et al., there was a significant correlation between the type of consumed cooking oils, education level, and socioeconomic status.[2] In general, higher

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education level enabled the individuals to receive more health-related information, particularly with respect to the required nutritional knowledge for the promotion of health behaviors and modify dietary habits.[15, 16] In a study by Jafari *et al.*, a significant association was observed between the consumed amount of oil and employment status of the mothers.[1] In nutritional studies in developed countries, it has been noted that healthy dietary habits increase with higher education and socioeconomic status.[15-18]

In this study, improving the socioeconomic status led to the switching of households to using vegetable oils for cooking. Previous studies in the United States have shown that quality diets are associated with higher income and vice versa.[15-20] Furthermore, the improvement of socioeconomic status led to the use of vegetable oils (e.g., sesame and olive), as well as the reduction of consuming solid and liquid oils. According to Jafari *et al.*, use of liquid oils was higher in the households with higher education level, where the use of solid oils was relatively low. Moreover, the authors reported that the consumption of solid animal oils and butter was higher in housewives compared to employed women.[1]

Conclusion

According to the results, most of the households used solid and liquid oils. Therefore, it is recommended that proper training programs and interventions be carried out in order to reduce the use of solid and liquid oils. It is also advisable to lower the costs of low-risk and healthier oils (e.g., olive and sesame), so that every household would be able to use these oils for cooking.

Acknowledgements

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