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Research Article

Fish consumption status in the north of Iran: A population based study

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Abstract: Human health depends on proper nutrition and the role of fish consumption to reduce cardiovascular disease has well known. The main objective of this study was to assess the however fish consumption and some related factors among Fars-native, Turkman and Sisstanish ethnic groups in Golestan province in northern Iran. This was a population-based cross-sectional study that enrolled 1969 subjects aged 15-65 years using stratified and cluster sampling and subjects were randomly selected from 100 clusters and each cluster included 20 cases. The sample size with 0.03 margin of error and 95% confidential interval at least estimated 1067 cases. Interviewers recorded the data using a multidimensional questionnaire comprising socio-demographic indexes. The fish consumption defined the times of intake in last week as follow: Under 1 or 1 to 4 times and more. We used Spss.16 software for analyses. Average fish consumption at least once a week and two times a week was seen in 16.5% and 7.3%, respectively. Consuming fish at least once a week in the Turkmen ethnic group (30%) was more than Fars-native (27%) and Sisstanish ethnic group (21.2%) and statistical differences was significant among of them (P=0.011).Odds ratio of fish consumption once a week or more in Turkman ethnic group was 1.569 times more than Sisstanish ethnic group and in Fars-native was 1.380 times more than Sisstanish ethnic group (P=0.001). Educational level and Economic status were not risk factor for fish consumption. The rate of fish consumption in Golestan province is low and it was seen in Turkman ethnic group more than and in Sisstanish ethnic group less than others. Contrary on other studies, low education and poverty are not risk factors for low fish consumption in this area.
Keywords: Fish consumption, Ethnicity, Education, Economic, Northern Iran.

INTRODUCTION

Nutritional status positively is associated with human health and imbalance diet lead to somatic and mental diseases. Nutrition is multifaceted and influenced by several factors including the geographical environment, the culture, economy, religion and custom [1,2].

A Mediterranean diet rich in vegetables and seafood sources well known as a reducing cardio vascular disease factors [3,4] and consumption of fish as a rich source of polyunsaturated fatty acids same as omega-3 investigated in lowering incidence of ischemic heart disease and longer life [5].

Studies in Iran [6,7] and in other worldwide [8] have shown that food behaviors among ethnic groups is not similar and knowledge about proper diet is different.

In New Zealand between fish consumption and mental health was shown a positive association [10,9] and study on the 2942 cardiovascular disease subjects was determined that omega-3 have a role of anti-arrhythmic, anti-thrombotic and anti-inflammatory [11]. The prevalence of cancer was low in high fish consumption people [12] and more intake of polyunsaturated fatty acids same as eicosapentaenoic acids and docosapentonoic acids decreased the stroke in women [13].

Previous studies were shown the low awareness about suitable diet in Iran [14,15]. Based on Iranian Fisheries Organization the average consumption of fish is 7 kg for capita in 2006. The average fish consumption in Africa and South America is somewhat equal while it was lower in developing countries compare to global average [16]. The Statistical Center of Iran [17] reported the average net cost of food in Iranian urban households is 23.6% of total net revenue

and it is high compared with a global average of 1,6 million people in Golestan province (northern Iran and south east of Caspian Sea), 43.9% and 56.1% are living in urban and rural area, respectively. Different ethnic groups such as Fars (native), Turkman and Sisstani are living in this region and most people in villages are farmers [18].

Due to the restriction in executing epidemiological projects, there has not been any study on the level of fish consumption in this area up till now; therefore it was necessary to design a research project about it. The aim of this study was to evaluate whether fish consumption and some socio-demographic related factors among three ethnic groups in Iranian northern families in 2010. The results of this study will be help the local health officials to establish a proper plan for make a good nutrition policy.

MATERIAL AND METHODS

We established a cross-sectional and analytical study with a sample of 1969 cases with equal age and sex and with three ethnic proportion (Fars-native=977, Turkamn=647 and Sisstani=345) of urban and rural area population aged 15-65 years living in 11 districts in Golestan province in northern Iran. With resumption of 50% rate; a confidence level of 95% and a maximum marginal error about 0.03, the sample size was calculated at lest1067 subjects. For more efficiency the sample size raised up 1969 subjects. We conducted a multistage cluster sampling techniques by 100 clusters with equal size of 20 subjects. In the first stage, the clusters were chosen randomly using systematic sampling technique based on postal code in urban areas and family health number in Primary Health Centers in rural areas. In the second stage, we randomly selected 20 subjects in each cluster. All family members in blocks (a complex of building) who were in 15-65 years were included in our study.

The frequency of fish consumption during before last week of study recorded by food frequency questionnaire on the five categories: under 1 time, 1 time, 2 times, 3 times and 4 and over times.

Educational level classified in three groups: Uneducated, 1-9 year schooling and high school or College. Economic status, with regard to Iranian social-economic, was categorized based on the six facilities item, the same as, separate bathroom, separate kitchen, vacuum cleaner, computer, separate freezer and washing machine. Each of them is one score. According to this list, the scoring of the economic status of samples in this study was as follows: poor $\leq$ 2 score, moderate = 3-4 score, and good $\geq$ 5 score.

The ethnic groups in this study were divided into three groups: 1) Fars -native: The natural inhabitant of this province, which they are recognized with same name in the society 2)Turkman: The inter marriage of this ethnic group with other ethnic group were rare therefore this ethnic group can be recognized as pure race. 3) Sisstani and Bluch ethnic group: This ethnic group were immigrated from Sisstan and Bluchestan province from the east of Iran far earlier.

The reliability was assessed using Cronbach's alpha coefficient and found to be 0.83. SPSS 16.0 software was used for the statistical analysis and chi-square test used for comparing frequencies. Multivariate logistic regression analysis was applied to estimate the odds ratio of fish consumption at 95% significant level. The P-value less than 0.05 were considered as statistical significant.

This study approved by Ethical Research Committee and consent was received from all participants. The subjects whose unwilling to participate in this study were excluded.

RESULTS

The mean and standard deviation of age was 39.2±14.3 years and 36.5% of them were living in urban area. The proportion of ethnicity was 49.6%, 32.9% and 17.5% in Fars-native, Turkman and Sisstani, respectively. Generally college education was seen in 6% and illiteracy was seen in 30.8% of subjects. Based on economic status, 33.1% were good and 22.5% were in poor level(Table 1).

On the whole, the fish consumption at once and twice in week was seen in 16.5% and 7.3%, respectively. Fish consumption at least onece in week in Turkman ethnic group (30%) was more than in Fars-native (27%) and in Sisstanish ethnic groups (21.2%). Statistical differences was significant among three ethnic groups (P=0.011)(Table 2).

Multiple logistic regressions were used to identify variables that contribute to fish consumption at least once a week. The odds ratio estimate was 1.569 [OR=1.721-2.172, CI 95%] for Turkman compare to Sisstani; 1.380 [OR=1.852-1.028, CI 95%] for Fars-native compare to Sisstani. The odds ratio estimate was 1.130 [OR=1.015-1.259, CI 95%] for men compare to women, and 1.214 [OR=1.088-1.354, CI 95%] for urban area compare to rural area. There was no statistical significant difference among economic stats and educational levels(Table 3).

Table 1: The distribution of characteristics of subjects (N=1969)

Variable		N	%
Ethnicity	Fars-native	977	49.6
	Turkman	647	32.9
	Sisstani	345	17.5
Gender	Men	985	50
	Women	984	50
Location area	Urban	719	36.6
	Rural	1250	63.5
Economic status	Good	652	33.1
	Moderate	874	44.4
	Poor	443	22.5
Education	Uneducated	479	24.3
	1-9 Y schooling	766	38.9
	9-12 Y schooling	606	30.8
	College	118	6.0

Table 2: The comparison of fish consumption status among three ethnic groups

Ethnicity	< once	Once	Twice	Thrice	Fourth ≤
Fars-native (977)	713(73.0)	182(18.6)	68(7.0)	9(0.9)	5(0.5)
Turkman (647)	453(70.0)	87(13.4)	63(9.7)	26(4.0)	18(2.8)
Sisstani(345)	272(78.8)	55(15.9)	12(3.5)	3(0.9)	3(0.9)
Total(1969)	438(73.0)	324(16.5)	143(7.3)	38(1.9)	26(1.3)

Table 3: The estimated odds ratio of lack of fish consumption during a week before study with different levels of socio-demographic factors using logistic regression (CI 95%)

Variable		P. value	Odds (Lower-Upper)
Ethnicity	Sisstani	-	1
	Turkman	0.003	1.596(2.172-1.172)
	Fars-native	0.032	1.380(1.852-1.028)
Gender	Women	-	1
	Men	0.026	1.130(1.259-1.015)
Location Area	Rural	-	1
	Urban	0.001	1.214(1.354-1.088)
Economic status	Good	-	1
	Moderate	0.289	1.019(1.283-0.928)
	Poor	0.990	1.001(1.214-0.826)
Educational level	College	-	1
	Uneducated	0.802	1.046(1.486-0.736)
	1-9 Y schooling	0.224	1.236(1.751-0.877)
	9-12 Y schooling	0.610	0.911(1.303-0.637)

DISCUSSION

Fish consumption has a undeniable role in health and preventive of cardio vascular disease [10] and food behavior is associated with socio-demographic factors, culture and food security [1,2].

In present study, 27% and 7.3% of subjects at least once and twice intake fish in per week, respectively and Turkman ethnic people tended to more consumption of fish than others while it was in Sisstanish ethnic group is low.

The studies in Iran about Fiash consumption are scarce. Farivar [14] in three province of Iran reported that level of fish consumption is low or medium and intake of fish is more than meat. Also in west of Iran [19] only 15.8% of families consumed fish twice a week and 49% of them didn't have fish in their food basket during a week before of study [29,20].

In Australians' families [21], the consumption of fish for twice a week were shown in 12% and cast was the main obstacle to intake of it.

In present study, socio-demographic factors such as gender, gender, location area and ethnicity influence on fish consumption while, economic status and educational level had no effect. The relationship between educational level and fish consumption was not shown in another study in Iran [20], and price of fish was a obstacle of fish consumption.

Verbeke [22] reported that fish razor and price were resulted to negative attitude about fish and using food flavors was a good way for more willing it. In Noeway [23], lack of fish product diversity was the main reason for low fish consumption.

In our study the fish consumption rate was statistically significant among three ethnic groups , so far in Turkman ethnic group is more than others. The fish consumption level among black, white and Spanish ethnic groups in was different in US [24] and it was different between Black and White hypertensive patients , too [25]. In Canadian people, the consumption rate among Cree, Inuit and Quebecers ethnic groups was different [26]. Burger in US [27] observed the fish consumption in Black more is more than White and education status more than economic status influenced on it in this area. Fish intake in college educated people was lower than under educated people.

In Canada [28], Bangladishi fishers mostly consumed frozen non-sport fish but Vietnamese fishers ate more ocean than freshwater fish.

Deviation from proper diet in northern Iran is in line with other study in Iran [15]. We don't evaluate the quantity and quality of fish consumption in food basket in Iranian northern families and it is our limiting factors.

CONCLUSION

Fish consumption in Goletstan province is low and compared with other ethnic groups, it was more in Turkman ethnic group. Unlike other regions, income and education are not fish consumption related factors. The low fish consumption odds ratio in rural area was more than urban and in women was more than men. In this area, the reasons of low fish consumption have not been determined, while establishing a training program about fish consumption benefits is necessary.

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