



Studies on consumption of fish and seafood and its relation with the health of people in the city of Hendijan, in Iran

Estudos sobre o consumo de peixes e frutos do mar e sua relação com a saúde das pessoas na cidade de Hendijan, no Irã

^{1,*}  Ali ABEROUMAND and ²  Soghra ABOUALI

¹Department of Fisheries, College of Natural Resources, Behbahan Khatam Alanbia University of Technology, Behbahan, Iran, P.O.BOX:63616-47189. Fax: +98-67152829969. Postal Addresses: N. 22, second Alley of Ab va barg, Zolfegari, Behbahan, Khuzestan, Iran.

²Student of Department of Fisheries, College of Natural Resources, Behbahan Khatam Alanbia University of Technology, Behbahan, Iran. Email: s.abouali4@gmail.com

* Author for correspondence: aberoumandali@yahoo.com

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ABSTRACT

Seafood, in addition to having a valuable and high-protein, are rich in various types of nutrients and suitable amounts of vitamins and minerals, but also has a small amount of fat and cholesterol. If we eat more fishes and other seafood in our diet, our health is better and the percentage of our disease is the lower. The main aim of this research was to determine and analyze the amount of seafood used in the Hanijan city. Survey method was used to achieve the research goals and the main tool was research questionnaire. Questionnaires were completed individually in each household. By random sampling, 67 subjects were selected. Because of coastal city and easy access to fresh fishes, the existence of local markets in the region, as well as the suitability of fishes prices, the consumption of fish in Hindijan city households was more than other sources of protein. Finally, consumption per year of seafood in Hanijan city was compared with other cities such as Behbahan, and Zanjan, so that consumption of fish in these cities was low. Studied people in the city of Hendijan in present research, eat twice a three times in week about 100 g or more from fried low-fat fishes (*Liza abu* and *Pseudorhombus arsius*), therefore they are very health, because over 20 years they have been eaten fish and shrimp in their food basket.

Keywords: Fish consumption. Seafood. Hendijan city. Iran. Health.

RESUMO

Os frutos do mar, além de terem uma proteína valiosa e rica em proteínas, são ricos em vários tipos de nutrientes e quantidades adequadas de vitaminas e minerais, mas também possuem uma pequena quantidade de gordura e colesterol. Se comermos mais peixes e outros frutos do mar em nossa dieta, nossa saúde é melhor e a porcentagem de nossa doença é menor. O principal objetivo desta pesquisa foi determinar e analisar a quantidade de frutos do mar usados na cidade de Hanijan. O método de pesquisa foi utilizado para atingir os objetivos da pesquisa e a principal ferramenta foi o questionário de pesquisa. Os questionários foram preenchidos individualmente em cada domicílio. Por amostragem aleatória, 67 indivíduos foram selecionados. Por causa da cidade costeira e fácil acesso a peixes frescos, a existência de mercados locais na região, bem como a adequação dos preços dos peixes, o consumo de peixe em domicílios da cidade Hendijan foi mais do que outras fontes de proteína. Finalmente, o consumo por ano de frutos do mar na cidade de Hanijan foi comparado com outras cidades como Behbahan e Zanjan, de modo que o consumo de peixe nessas cidades era baixo. Estudou pessoas na cidade de Hendijan em pesquisa atual, comer duas vezes a três vezes na semana cerca de 100 g ou mais de peixes fritos de baixo teor de gordura (*Liza abu* e *Pseudorhombus arsius*), portanto, eles são muito saudáveis, porque mais de 20 anos foram comidos peixe e camarão em sua cesta de alimentos.

Palavras-chave: Consumo de peixe. Frutos do mar. Cidade de Hendijan. Irã. Saúde.

INTRODUCTION

Seafood such as fish have a high quality digestible protein. Fish and seafood are important in preventing cardiovascular diseases, because large percentage of fish fats is unsaturated and it contains low levels of cholesterol. Fat "Omega 3" in fish fillet, reduces fat and cholesterol levels. Minerals found in fish meal such as phosphorus, calcium, iron, selenium, magnesium, fluorine, iodine and other micronutrients, effect on human health. Seafood is one of the most important proteins for a healthy diet. It is rich in essential amino acids, unsaturated fatty acids, all vitamins, and all trace minerals. Therefore, it is easy to digest because of lack of connective tissue (KIZILASLAN &NALINCI, 2013; Oğuzhan, et al., 2009; TURAN, et al., 2006). Several researchers have investigated the nutritional high value of fish and its effect in human diet. Some studies have shown that fish consumption helps prevent cardiovascular diseases, high blood pressure, cholesterol, Alzheimer's disease, and various types of cancer (TURAN, et al., 2006; BARBERGER-GATEAU et al., 2002; MCNAUGHTON, et al., 2008; PIENIAK, et al., 2008; VERBEKE & VACKIER 2005).

Despite the many advantages, Seafood consumption part and fishery products in the food basket of Iranian households are low compared to other consumed protein sources. Iran access to great aquaculture resources in the north and south and fish farming in lakes and rivers and cold water fishes pools indicate the abundant capacities and potential of Iran for create significant works in this sub section (FARS FISHERIES, 2015). Many indicators in using water resources are considered by experts, such as catch and aquaculture values, fish consumption per year, etc. The FAO has been reported 17.7 kg fish consumption per year in the world, 26 kg for Western Europe and even 80 to 90 kg for Japan. The same source declares 7.7 kg for Iran, According to the World Food Organization (FAO), fish consumption deficiency in Iran is clear (FAO, 2010).

The city of Hendijan with a population of 45 thousand and about 90 km border with the Persian Gulf is located in south of Khuzestan. About six thousand tons of fishes and shrimps catch annually. Due to the importance of seafood, especially fish and shrimp in the south of the country, people to use seafood. In Iran, because various sources of aquatic production and the made progress in recent years in aquaculture in the southern waters, there are a suitable environment for aquaculture production, but unfortunately due to the lack of understanding of people to variety of food and pharmaceutical properties and how to cook the fish, to use this seafood is limited. Aim of this study was study on seafood consumption levels and its relation with the health of people in the city of Hendijan, in Iran.

MATERIAL AND METHODS

The statistical populations of this study were North Hendijan people, which are divided into several regions including: Farhangian, Danesh Koy, Pasdaran Koy, Kahbad, which have been investigated.

Samples and sampling method

The method of sampling in this research was random. In this research, 67 households were selected from the mentioned areas and the questionnaires were distributed which previously presented in 14 questions with 4-5 options with different answers.

It should be noted that these questionnaires were also distributed to public places. The respondents were answered to these questionnaires were in different age groups, and had degrees from an undergraduate to master or an employee to housekeepers.

In this method, to ensure the satisfaction of the accuracy of the questionnaires response for each household, the required explanations were given for each question. In this method, by calculating the average amount of fish per purchase, multiplied by the number of purchases per year divided by the number of family members, consumption amount per year were obtained (FAILLER & KANE, 2003).

$$F_c = L \times M / G$$

Eq. (1)

where:

L - Average amount of fish purchase; M - Purchase time per year; G - Number of household members and FC - consumption amount per year.

RESULTS AND DISCUSSION

Results of this research have been showed in Figures 1-10.

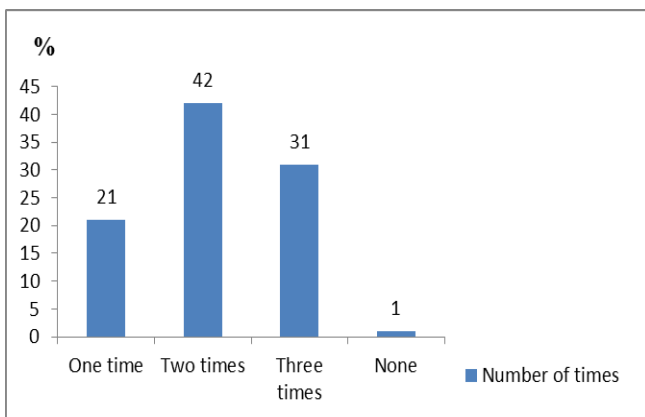


Figure 1. Number of times of fish consumption per week by studied households

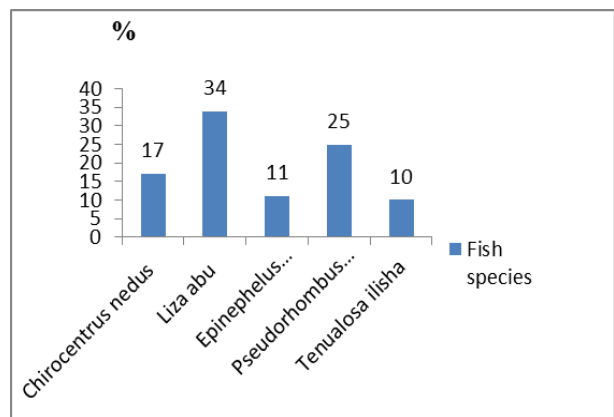


Figure 2. Comparison of used fish species by studied households per week

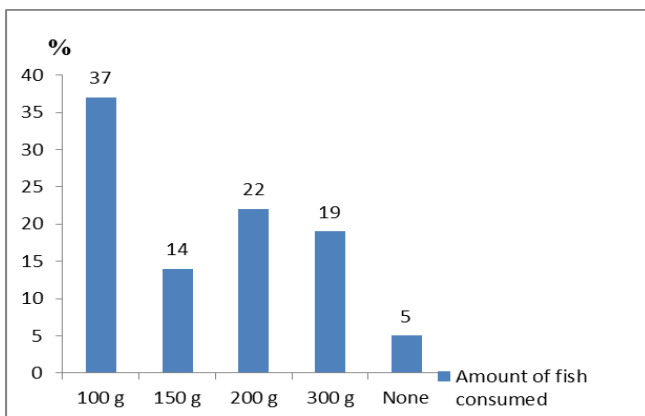


Figure 3. Amounts of consumed fish fillet by studied households per week

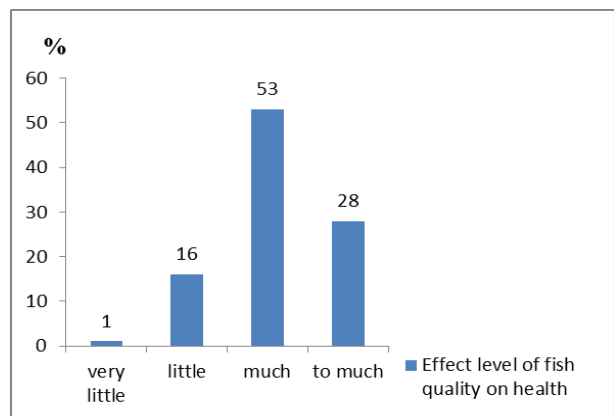


Figure 4. Levels of household information on the impact of fish quality on studied households health



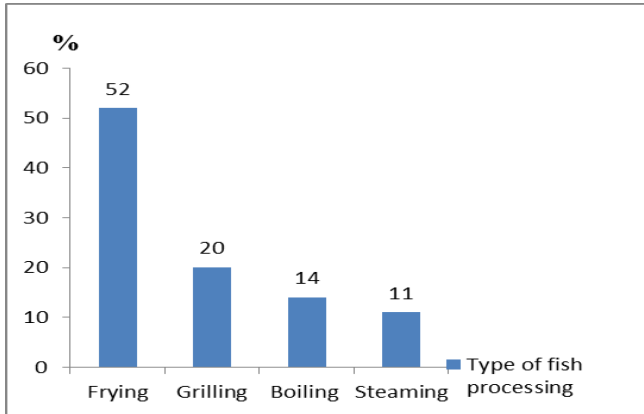


Figure 5. Comparison of studied households information about methods of fish processing

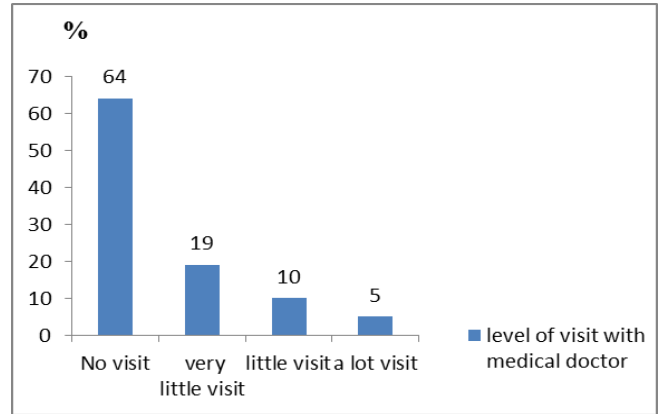


Figure 6. Comparison of visits levels studied households with medical doctors for diseases check per month

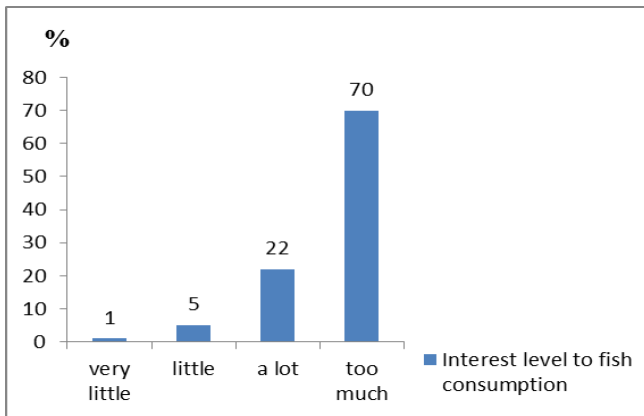


Figure 7. Levels of interest of studied household to fish consumption

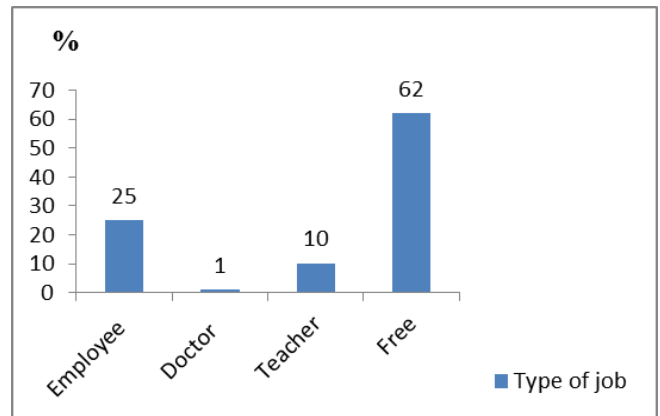


Figure 8. Comparison of jobs of studied household heads

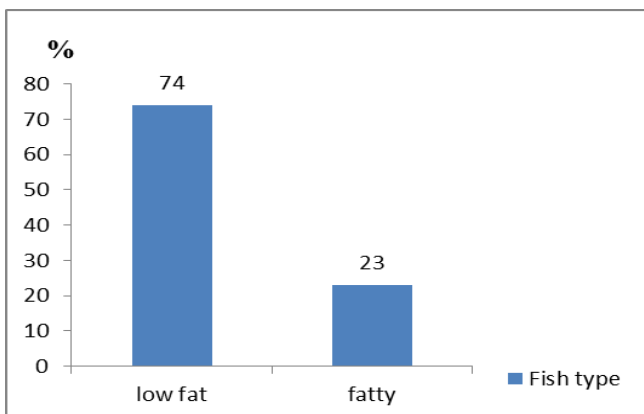


Figure 9. Comparison of consumption of fish species in studied household in per month

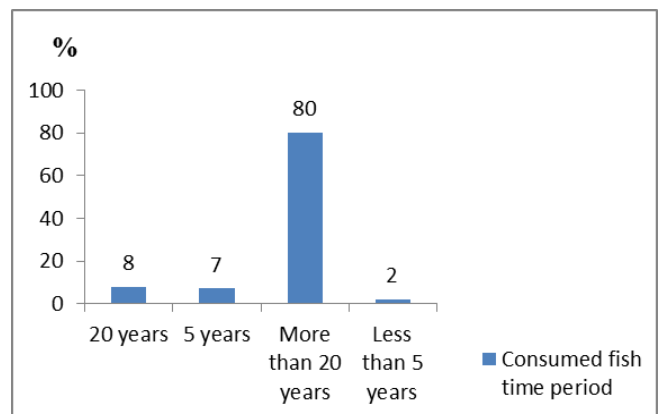


Figure 10. Comparison of fish consumption time period in studied households



The results of the research show that 42% of people twice in week intake fish in their diet and 31% of them weekly 3 times. These results are a good indicator for amount of used seafood by the population, and they are very important for the consumption of households, but, at very low levels, 1% of households do not eat per week (Figure 1). Figure 2 showed that highest consumption of fish in Hendijan city. The obtained data are as follows: fish *Liza abu* with 34%, fish *Pseudorhombus arsius* with 25%, fish *Chirocentrus nedus* with 17%, fish *Epinephelus coioides* with 11 %, and fish *Tenualosa ilisha* with 10%. The fish *Liza abu* do not have a big size and it catches more in the summer and autumn seasons. Because of the collective movement of this fish, it catch by fishermen, and it can be found in the market in large quantities and, of course, low prices in the season of fishing, It is also rich in omega-3. Despite its small body, its texture and taste was good, it has a lot of customers, so it is used most in the Hanijan city. The second fish that has been accepted by studied people after fish *Liza abu* is fish *Pseudorhombus arsius*. This fish has a special quality due to its tasty fillet and very little thorns and, of course, it is easy cooking. It has a about 25% consumption. Fish skin easy separation, as well as very little waste, it is exception among number of fishes so that is economical to buy and cooking. Fish like fish *Tenualosa ilisha* and *Chirocentrus nedus*, despite good and delicious flavor, it have been shown less willing to be consumed by studied people due to their very thorns than other fishes. According to research, about 35% of living costs were paid for purchase of seafood, and about 1% of studied people did not pay any cost for buying fish. This indicates that very few families will not be able to buy fish, and there is much hope for pay money on buying seafood which is one of the main monthly plans for each household. The costs are considered differently for buying seafood (fish and shrimp) based on jobs of head of household and the salary of work per household. Regard to coastal city and the high numbers of fishermen in the families or those who do other jobs in addition to their main job, the paid cost for seafood was low relative to the estimated amount for consumption per household. It was expected that the consumption of seafood in households twice per week would be higher than the cost of purchasing more than 50% per household, but 8% of studied people, about 50% of their salaries has been paid for buying seafood.

Figure 4 showed effect of fish quality on studied people health. According to obtained results, about 53% of the people have much information about this subject, which can be seen as a positive result in consumption of fish per week. People very well use fishes, because of having good information on quality of fish in health, and 28% have a lot of information about it, but a small percentage of studied people know little or very little information (16% and 1% respectively). The amount of fish fillet consumption per week per household in this study is divided into five categories showed in Figure 3, which is 100 g, 150 g, 200 g, 300 g, and none which was the highest percentage to 100 g with 37%, and next was 200 g with 22% and 300 g with 19%. The fish consumption, according to the statistics obtained by the association of heart of the United States, which recommended consumed fish was about 100 g per serving, so that agreed with consumption of fish fillets by Hendijan studied people. Figure 4 showed that because of coastal city Hendijan and presence of fresh fishes in market, citizens have a good information about healthy and fresh fishes from spoilage fishes. According to results, about 50% of studied households had a lot of information about the health of the fish and about 28% of people have good information and about 5% of households have very little information. We conclude that we conclude that unhealthy fishes are not in household diets tables. In Figure 5 we compared methods of fishes cooking and consumption, which,

unfortunately, found highest level for frying type with 52%, which was worst kind of cooking. Fish frying in a lot of oil, reduces nutritional value of fish and fish oil. In addition, it increases the percentage of heart attack in people. The best type of processing was boiling and grilling and steaming can be found with 20% of households. They use fish as grilled, and the percentage of fish consumed in steam was about 11 %. This kind of cooking was a better cooking method than frying. In order to prevent the disease, this method of cooking of frying should be used as low as possible, so that the people health is guaranteed. This can be prevented by informing and educating families about the disadvantages of frying. In Figure 6, number of visits to medical doctor has been reviewed in the month. Since Hendijan people were eaten three times in week seafood and are well aware from benefits of eating fish and shrimp, it was expected that a very little percentage from them in month were visited to the doctor, when they answer the questions. In this present study, we almost conclude that about 19% too little visit, but most do not visit with a 64%. Another result of this research is as follows: little visit to doctor were 10% and much visit to doctor was 5%. The place of life of people has a significant impact on the diet and nutrition of them families. In a city where fresh fishes are available easily and cheap, seafood is definitely included in diet table and the tastes of people are also enjoyable in marine food. For this reason, the interest of people in marine food, has shown about 70% was very much, and in addition, about 22% of people have a high option, 5% are low and 1% have chosen too little option (Figure 7). Results in Figure 8 showed that the geographical location of each city has a significant impact on the jobs of the household heads, and as the city of Hendijan was near the sea and the river, there are many fishermen working in this area, so that about 62% of heads of households have free jobs, about 10% was teachers, and 23% was employees and one% was doctors. Results in Figure 9 showed in the fishes market of Hendijan city, the fishes are less fatty. Because of salty water of sea, the salty fishes in this city were more than cold water, fresh and high-fat fishes, so that people tend to buy low-fat seafood and fish more than fatty and processed fishes. Therefore, about 74% of the people use low-fat fishes and about 23% also high-fat fishes. According to obtained results in Figure 10, period of time the consumption of fish in the households was too old, so that 80% of consumption of fish was more than 20 years old, about 8% was 20 years, 7% was 5 years old, 2% to less than 5 years.

It is known that education and local culture levels might have an effect on fish consumption (HICKS et al., 2008). Fish freshness is another important factor affecting fish consumption. People can safely eat 2–3 serves a week of most types of fish. However, because of the presence of higher levels of mercury in some fish there are a few types that should be limited (FOOD STANDARDS AUSTRALIA NEW ZEALAND, 2015). People who regularly consume diets high in fish tend to have lower risks of a range of conditions including heart disease, stroke, macular degeneration and dementia in older adults. Fish provides energy (k j), protein, selenium, zinc, iodine and vitamins A and D, as well as omega-3 long-chain polyunsaturated fatty acids (omega-3) to the diet (NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL, 2013).

CONCLUSION

Because studied people in the city of Hendijan in present research, often have fishing jobs, and eat twice to three times in week about 100 g or more from fried low-fat fishes (such as *Liza abu* and *Pseudorhombus arsius*) and shrimp. Since they have useful information about the effects of quality of fish on

human health and they are interested in fish consumption, therefore they are very health and they do not take diseases so that they less visit to the doctor, because they have been eaten fish and shrimp in their food basket over 20 years.

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AUTHOR CONTRIBUTION

The Dr. Ali Aberoumand, PhD in Food Science accompanied the studies on consumption of fish and seafood and its relation with the health of people in Iran, participated in the sequence alignment, and drafted the manuscript.

Iran Soughra Abouali, as student, from Behbahan Khatam Alanbia University of Technology, Behbahan, Iran, supporting of samples analysis, as well contributed to the suggestion of scientific references.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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