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Dietary and Physical Activity Pattern in Fars Province, National Plan of Chronic Disease Risk Factor Surveillance

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Abstract

***Background*:** Changes in lifestyle, especially in different aspects of nutrition and physical activity, have been associated with change in the patterns of diseases, from contagious diseases to non-communicable diseases, and with the prevalence of chronic diseases. Accordingly, this study is carried out within the framework of National Plan to Care for Risk Factors of Non-communicable Diseases with the aim of comparing the dietary patterns and physical activity of people under study in Fars province during 2006-2007.

***Materials and Methods*:** Using the WHO Step-by-step Evaluation Model for Risky Factors, the present study determined fifty 20-person clusters, totally 1,000 people within the age group of 15-64 for each year as the research population. After identifying the applicable people, they were visited at their homes and the questionnaires were filled out for them. The necessary analysis was carried out using Version 6 of EPI-info and Version 10 of STATA software.

***Results*:** The findings of the present study indicated that men have more intense physical activity than women (p=0.001). The results also indicated a significant increase in consumption of fruit (p=0.01), vegetable (p=0.001), and fish (p=0.001) in 2007 as compared with 2006. The average number of the consumed vegetable units in women was higher than that of men (p=0.01).

***Conclusion*:** The findings of this study indicated that the average number of daily consumed units of fruit and vegetable as well as the frequencies of fish consumption per week was lower than the recommended amounts.

Introduction

The pattern of common diseases in human societies has changed greatly during several past decades from the infectious, mother and child diseases towards chronic and non-communicable diseases such as obesity, diabetes mellitus, cardiovascular diseases, hypertension, cerebral infarction, and some kinds of cancers [1]. The related problem to chronic diseases is increasingly expanding all over the world. According to 2001 report, about 60% of the 56.5 million deaths reported in the world were related to chronic diseases and it is expected that by 2020, the ratio of the problem of non-communicable diseases would reach 57 percent. Almost half of the whole mortalities caused by chronic diseases are related to cardiovascular diseases [1, 2]. Aging, weight, hypertension, smoking, alcohol intake and disorder of blood fats are considered the risky factors of the cardiovascular diseases [2, 3]. Although several factors play their roles in the incidence of cardiovascular diseases, the environmental factors such as diet plays an important role in the development of these diseases [4].

Occurrence of quick changes in diet and lifestyle, concurrent with industrialization, urbanization, economic development and market globalization during past decade have left a considerable effect on the health and nutrition of societies, especially in the developing countries. Some instances include increasing consumption of high-energy and fat-rich diets and decreasing the unpurified carbohydrates [1]. Epidemiologic studies have shown that nutrients of the diet such as potassium, antioxidants and folic acid, which are found a lot in fruits and vegetables, are related to the decrease of number of mortalities caused by the cardiovascular diseases [5]. In addition, many studies suggest that there is a relationship between weekly consumption of fish with the decrease of mortality caused by coronary artery disease (CAD) [5, 6]. Moreover, gaining high amounts of saturated fatty acids would increase serum cholesterol level and mortalities due to cardiovascular diseases [7]. The results obtained from the study of glucose and lipid in Tehran revealed that the average intake of starch vegetable, other kinds of vegetable and fruit were 50.8±49, 304±179, and 211±147 g/day, respectively; 59% of individuals ate fruit everyday, 39.7% ate fruit in a week and 9 percent did not eat fruit at all [4].

The traditional approach in nutritional epidemiology has focused on the effects of a kind of nutrient or a single unit of food; however, nutrients and foods are consumed in combination with each other. Therefore, the effects of nutrients and foods can only be observed while they are studied at the same time [8].

Unfortunately, currently the incorrect food patterns have been associated with loss of physical activity and inactive lifestyle [1]. Physical activity reduces the risk of cardiovascular diseases and sedentary people are subject to the cardiovascular diseases two times more than the active people. This issue is so important in such a way that the American Heart Association in 1992 announced inactivity as the primary risk factor of cardiovascular diseases [9]. Today, there is an ever-increasing attempt in most countries to counter the increase of chronic diseases as the main health priority [1].

The national plan to care for risk factors of non-communicable diseases has provided an opportunity to study the dietary patterns and physical activity from the epidemiological point of view. Aiming to study such patterns on the people under study in Fars province during 2006-2007, the present study is carried out on behalf of the Ministry of Health and Medical Education.

Materials and Methods

The present study is a cross-sectional research, which is designed as a national plan (on behalf of the Ministry of Health and Medical Education) by the Bureau of Non-communicable Diseases Risk Factor Care of Shiraz University of Medical Sciences using the documents of Step-by-step Care approach of risk factor of such diseases. These documents are recommended by the WHO to achieve the valid and comparable data at national and international levels.

The people under study (1996 people: 1000 people in 2006 and 996 people in 2007) were selected throughout the whole Province using the information available in the database of Geographic & Postal Coding Department of the Islamic Republic of Iran Post Company through a systematic approach and multi-stage cluster sampling method. The characteristics of sampling method include the proportion of distribution of the selected cluster-heads with the dispersion of number of families in different postal areas of province and the proportion of urban and rural population. In this province, fifty 20-people clusters, totally 1000 people from the age groups of 15 to 64 (for each year), were determined as the population under study. After identifying the pertinent people, on a specified day, they were visited at their homes and the questionnaires were filled out for them. Each questionnaire includes personal information and the information on all the aspects of the risk factors of non-communicable disease.

The present paper discusses the dietary pattern (fruit, vegetable, fish and oil consumption pattern) as well as physical activities. The intense activity is considered an activity which at least lasts for 10 minutes continuously and causes a sharp increase in respiration and heartbeat, whereas the average activity is considered an activity which at least lasts for 10 minutes continuously and causes a slight increase in respiration and heartbeat. Moreover, the intense and average sports activities were considered similarly. The collected information was entered the computer through version 6 of EPI-info software and finally analyzed by STATA-10 program using independent t-tests, χ^2 and Fisher's exact test.

Results

This study analyzes and evaluates the dietary patterns and physical activities of 1996 people residing in the urban and rural areas of Fars province whose dietary pattern and physical activities were studied during 2006–2007. Table 1 shows the distribution of people according to the physical activity specified by gender and year of study. In terms of the intense physical activity, no significant difference was observed during 2006 and 2007. However, the average number of days for men with the intense activities was significantly more than that of women (p=0.001). Meanwhile, in terms of the average number of days on which one has an intense and/or average physical/recreational activity, no significant difference was observed between women and men (p >0.05). Table 1 shows the fruit and vegetable consumption of the population.

The fruit consumption (p=0.01) and vegetable consumption (p<0.001) in 2007 has increased significantly as compared with 2006. In addition, the average vegetable consumption in women was more than that of men (p=0.01), whereas fruit consumption had not a significant difference (p=0.4). In terms of fish consumption, the frequency of average weekly consumption of fish for all the people under study was 0.5 times. Among those who reported fish consumption, it was 1.4 times in a week (Table 2). The mean of fish consumption in 2007 had a significant increase as compared with 2006 (p< 0.001). However, the average of fish consumption between the two genders did not show a significant difference (p>0.05). The major type of consuming oil for cooking in a family was hydrogenated vegetable oil and liquid vegetable oil placed at the second position (Table 2). Comparing oil consumption conditions during 2006 to 2007, we noticed the decrease of hydrogenated oil consumption and the increase of liquid oil consumption; this difference was statistically significant (p=0.001), but no significant difference was observed between the type of consuming oil and gender within the two years (p>0.05).

Discussion

This study showed that consumption of fruit, vegetable and fish is increased in 2007 as compared with 2006. In addition, consumption of hydrogenated oil is decreased in 2007 and people tended to increase consumption of liquid vegetable oil. The condition of physical activities has not been changed much for two years. Altogether, the women participated in exercises and recreational activities less than men. The population with low consumption of livestock foods and high consumption of fruit and vegetable had lower cardiovascular diseases than the population with high consumption of livestock foods [10].

Table 1. Frequency of people in terms of physical activity and consumption of fruit and vegetable specified by gender in 2006 and 2007

Frequency / Questions on Physical Activity	2006 (n=1000) Male	2006 (n=1000) Female	2006 (n=1000) Total	2007 (n=996) Male	2007 (n=996) Female	2007 (n=996) Total	Total (n=1996)
Having a kind of work involving intense activity	135 (27)	43(8.6)	178(17.8)	117(23.6)	22(4.4)	139(14)	317(15.9)
Average of number of weekdays with too intense physical activity	4±2.1	3.7±2.3	4±2.2	4.7±2	2.6±1.6	4.3±2.1	4.1±2.1
Having a kind of work involving activity with moderate intensity	265(53)	266(53.2)	531(53.1)	277(55.8)	278(55.7)	555(55.8)	1086(54.4)
Average of number of weekdays involving physical activity with moderate intensity	4±2.2	4.7±2.4	4.3±2.3	4.8±2	5.3±2.1	5.1±2	4.7±2.2
Using bicycle or walking for commuting (At least 10 min)	344(68.8)	379(75.8)	723(72.3)	353(71.6)	374(74.9)	727(73.3)	1450(72.8)
Average number of days on which they use bicycle or walk	5±2	4.4±2.2	4.7±2.1	5.2±1.9	4.4±2.1	4.8±2.1	4.7±2.1
Doing exercise or recreational activity with high intensity	151(30.2)	31(6.2)	182(18.2)	144(29.2)	38(7.6)	182(18.3)	346(18.3)
Average number of days involving high intensity exercise or recreational activity	2.6±2	2.1±1.6	2.5±1.9	2.4±2	2.6±2.3	4.8±2	2.5±2
Doing exercise or recreational activity with medium intensity	144(28.8)	92(18.4)	236±(23.6)	153(31)	107(21.4)	260(26.2)	496(24.9)
Average number of days on which fruit are consumed in a usual week	3.4±2.3	3.9±2.4	3.7±2.3	3.9±2.2	4.3±2.4	4.1±2.3	3.9±2.3
Average number of units of fruit consumed in a day	1.1±1.3	1.2±1.39	1.2±1.39	1.3±1.1	1.3±1.2	1.3±1.18	1.2±1.3
Average number of days on which vegetable is consumed in a usual week	4.1±2.3	4.6±2.3	4.4±2.3	4.5±2.3	5.2±2.2	4.9±2.3	4.6±2.3
Average number of vegetable unit consumed in a day	1.09±1.2	1.2±1.2	1.1±1.2	1.5±1.2	1.6±1.25	1.6±1.2	1.3±1.2
Average number of fruit and vegetable unit consumed in a day	2.26±2.1	2.4±2.1	2.3±2.1	2.8±1.9	2.9±1.9	2.9±2	2.6±2
Percentage of people with consumption of 5 units or more fruit or vegetable	56(11.2)	63(12.6)	119(11.9)	84(16.8)	84(16.8)	168(16.9)	287(14.4)

* Numbers in table shows the number (percentage) of positive replies and average ± standard deviation

Table 2. Frequency of fish consumption and type of (cooking) oil in terms of gender in 2006 and 2007 (The numbers in table shows the number (percentage) of positive replies and average±standard deviation)

Variable	Frequency	2006 (n=1000) Male	2006 (n=1000) Female	2006 (n=1000) Total	2007(n=996) Male	2007(n=996) Female	2007(n=996) Total	Total (n=1996)
	No consumption at all	356(71.2)	357(71.4)	713(71.3)	186(50.8)	185(49.2)	371(50)	1084(62.2)
	Once a week	103(20.6)	95(19)	198(19.8)	124(33.9)	129(34.3)	253(34.1)	451(25.9)
	More than once a week	41(8.2)	48(9.6)	89(8.9)	56(15.3)	62(16.5)	118(15.9)	207(11.9)
Fish	Average of consumption of all people	0.7±0.3	0.8±0.4	0.7±0.4	0.8±0.6	0.9±0.7	0.9±0.7	0.8±0.5
	Average of number of consumption in consumers	1.3±0.6	1.4±0.9	1.4±0.8	1.4±0.7	1.4±0.8	1.4±0.79	1.4±0.7
	Hydrogenated Vegetable oil	317(63.4)	329(65.8)	646(64.6)	240(48.4)	233(46.6)	473±(47.5)	1119(56.1)
Consumed	Liquid Vegetable Oil	176(35.2)	168(33.6)	344(34.4)	250(50.4)	266(53.2)	516(51.8)	860(43.1)
oil	Butter or Animal Oil	2(0.4)	2(0.4)	4(0.4)	6(1.2)	__	6(0.6)	10(0.5)
	Others	5(1)	1(0.2)	6(0.6)	__	1 (0.2)	1(0.1)	7(0.4)

The research conducted by Fung et al. showed that more consumption of fruit, vegetable, fish, whole grains, and poultry meat has an inverse relationship with fasting insulin level and serum homocysteine and has a direct relationship with plasma folate level [8]. Several studies have shown that consuming more folate, fiber and antioxidants reduces the risk of cardiovascular diseases. American Heart Association and other international institutes have advised that the daily consumption of fruit and vegetable should exceed 5 units a day to prevent the cardiovascular diseases. This advice is based upon this theory and belief that useful combination of micronutrient, phytochemicals, antioxidants and fiber in fruits and vegetables decreases the risk of cardiovascular diseases and plays a role in preventing such diseases [10]. In the present study, the average consumption of fruit and vegetable in 2006 and 2007 are 2.3 and 2.6 units a day respectively, which greatly differs with the daily consumption of 5 units of fruit and vegetable. Of course, a similar trend is observed in other regions of Iran. For instance, Setayeshgar et al. conducted a study in 2007 aiming to evaluate the consumption of fruit and vegetable in high school girl teenagers, in three socioeconomic regions of Tehran [11]. This study showed that 72 percent of them consumed less than 5 units of vegetable and fruit. Several extensive studies showed that rather low consumption of fish regularly is effective in preventing cardiovascular diseases [12-14].

Consuming fish, even moderate or little amount of that, has considerable effects and its effects greatly depend upon the profile of fatty acids of the consuming fish [15]. The study conducted by Zhang et al. showed that consuming fish decreases the risk of cardiovascular diseases [16]. In the present study, fish consumption in

2007 had an increasing trend as compared with 2006. Given that Boushehr province, which is the center of fishing, is the neighboring province of Fars province, fish has always been available there. However, the major reason for changing fish consumption pattern in the province might be the increase of people's knowledge about the advantages of omega-3 fatty acids. By increasing the level of serum cholesterol, saturated fatty acids increase the risk of cardiovascular diseases. By decreasing synthesis and activity of cholesterol receptors, saturated fatty acids increase the level of serum cholesterol. Replacing saturated fatty acids with non-saturated ones, the total cholesterol and LDL cholesterol decrease [7].

In spite of the extensive trainings about the risks of consuming hydrogenated oil on society, unfortunately, this type of oil is quite common in Fars province. Of course, in the present study, the increase of liquid oils consumption and the decrease of hydrogenated oil indicate the increase of people's knowledge on the disadvantages of the saturated oils. Inactivity is one of the risk factors of coronary artery diseases [17].

A study carried out by Rahmaninia et al. in 2004 showed that there is an inverse relationship between the level of physical activity and serum total cholesterol, low density cholesterol, and the ratio of total cholesterol and LDL [9]. A study also carried out by Motafaker et al. in 2007 in which the levels of physical activities was as follows: 67.3 % had no physical activity; 15 % had adequate activity, and 17.7 % had high activity [18]. In this study, the average number of days on which they had intense physical activity was registered; here, men had a higher record. The difference has caused by the position of women in the society, their limitations to access valuable sources, and society's expectations toward women lives. With respect to the importance of exercises in preventing the chronic diseases, especially cardiovascular diseases, the necessity of these measures should be taken into account: increasing people's knowledge, planning to increase physical activities through creating more facilities, and planning for public sport, especially for women. In addition, the results obtained from the study showed that the quantities of the consumed fruit, vegetable and fish are lower than the recommended ones. The population should also be informed more about the advantages of consuming such items.

In this study only some items of diet are discussed. Accordingly, it is recommended to discuss all the items of diet, including dairy, meat, salt, processed foods, etc and cooking method of consuming food to comment better on the dietary condition of the province population and dietary risk factors of the cardiovascular diseases in the province. Given that the first step to involve in controlling of non-communicable diseases in the society is the study of the present status, conducting similar research to study the outbreak of risk factors and effective factors in them can be considered an important step towards the design of suitable measures for prevention of such diseases.

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Authors' Contributions

All authors had equal role in statistical analysis and manuscript writing.

Conflict of Interest

The authors declare no conflict of interest.

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