Journal of Nutrition and Food Security
Shahid Sadoughi University of Medical Sciences
School of Public Health
Department of Nutrition
Nutrition & Food Security Research Center

eISSN: 2476-7425 pISSN: 2476-7417 JNFS 2020; 5(3): 259-265 Website: jnfs.ssu.ac.ir

Effective Factors on the Amount and Type of Consumption Milk in Ardabil City of Iran: A Descriptive Study

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ARTICLE INFO

ORIGINAL ARTICLE

Article history:
Received: 6 Dec 2019
Revised: 31 May 2020
Accepted: 31 May 2020

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ABSTRACT

Background: Among various food products, milk is among the most basic nutrient foods. Studies demonstrated that consumption of milk and its products are low in Iranian families. This study was conducted to investigate the type and amount of milk consumption in Ardabil city in 2015-2016. **Methods:** This descriptive study was conducted among 300 people (199 female and 101 male), who referred to health centers of Ardabil. The participants were selected from both genders of healthy people with no diseases aged ≥18 years. Some questioners were applied to measure milk consumption. **Results:** Of 300 studied people, 51.67% consumed pasteurized milk, 40.67% consumed fresh (Bulk) milk, and 4.67% used both of them, while 3% did not use any type of milk. Among the milk company brands, Mihan was the first choice and had the highest consumption rate; 87% of people paid attention to the quality of milk in choosing one brand. Most people used Teflon cookware for boiling milk and many of them used a glass bottle for storing it. **Conclusion:** Posturized milk has the highest consumption rate. A few people did not consume milk in Ardabil and the quality of milk was the most important factor for its consumption. A significant association was found between the type of consumed milk and the individuals' educational level, age, and the household head's educational status. More extensive studies at the national level should be conducted to investigate the causes and effective factors in solving the current problems with regard to milk consumption.

Keywords: *Consumption; Dairy products; Milk; Ardabil*

Introduction

Nowadays, consumption of milk and its products is considered as an indicator of development in human communities. Ongoing research on dairy products showed a high correlation between the consumption of milk products and the level of public health. Among various types of food, milk and dairy products are among the most basic nutritious foods (Sali and

This paper should be cited as: Alighadri M, Musazadeh V, Gholinia B, Hashemi SY, Attarmadraki F, Shojapour A, et al. ***Effective Factors on the Amount and Type of Consumption Milk in Ardabil City of Iran: A Descriptive Study.*** *Journal of Nutrition and Food Security (JNFS),* 2020; 5 (3): 259-265.

[DOR: 20.1001.1.24767417.2020.5.3.1.0]
[DOI: 10.18502/jnfs.v5i3.3798]

Babaei, 2019). These semi-perfect foods are highly beneficial not only for children, but also for adults (Hojati *et al.*, 2013). Milk is the main source of protein, vitamin B2, vitamin A, Vitamin E, Vitamin D, and calcium (Vahedi *et al.*, 2007).

Today consumption of milk and its products is one of the most important recommendations of nutrient sciences, Food and Agriculture Organization (FAO) and World Health Organization (WHO) experts, so that its intake shows the society development (Mirza *et al.*, 2014). Consuming three glasses of milk or a combination of 1-2 glasses of milk, 1 bowl of yogurt, and 40-50 gram of cheese can cover the body's requirement to calcium (Hojati *et al.*, 2013).

According to the last national research over food consumption patterns and national nutritional status in 2000-2001 by the nutrition and food industry research institute, the average daily consumption of dairy products was estimated. The average daily consumption of dairy products in the urban and rural areas were 142 and 134 g/person/day, respectively. The average daily consumption of dairy products at the national level was 139 and 38 g per person, which is less than the recommended level for this group of nutrients (Taghipour *et al.*, 2014). One study concluded that dairy shortage was highly common, so that 77.5 percent of all participants consume less than the recommended standard (Sali and Babaei, 2019).

Statistics showed that 5.6 ton milk was produced in-country in 2001, but due to the high wasting amount, the national consumption is 75 kg/ person/year which is less than other countries and international recommended standard values. Accordingly, increasing per capita milk consumption according to the recommended standards provided by the WHO is one of the main governmental policies. These policies should be applied from production to consumption in order to upgrade the community health (Mirza *et al.*, 2014). The low consumption level of dairy products in Iran can be due to the differences in ethnicity features, cultural status, geographical location, social and individual capacities, and economic status (Esfarjani *et al.*, 2014).

One of the most important food groups in nutrition is milk and dairy products; consumption of these products depends more on their quality. The primary criterion with regard to raw milk quality is its microbial activity, which depends on the storage duration and condition from the farm to factory (Yarahmadi *et al.*, 2008). Milk and dairy products are among the important sources that can be influenced by biological agents. So, it is estimated that 70% of the infectious diseases can be transmitted to humans from unhealthy food and over 450 types of viral, fungal, parasitic, and microbial diseases can be transmitted to human from foods derived from animals. In this vein, all types of milk and dairy products are the major parts of these foods and if their production and distribution are not hygiene and aseptic, disease transmission and food toxicity may follow (Peymaneh and Mohtasab, 2006). Application of palm oil in producing dairy products has led people to consume raw milk instead of the industrial pasteurized milk, which enhanced the prevalence of some diseases such as Brucellosis (Vakili *et al.*, 2007).

Pasteurization decreases the risk of bacterial infections, which can be transmitted from dairy products to humans. Therefore, heating procedures should have the least chemical and physical effects on the dairy products (Hojati *et al.*, 2013).

This study examined the quality of raw milk and investigated the consumption of pasteurized milk in the families of Ardabil city. Moreover, factors affecting milk consumption were studied. Findings of this research can help authorities to design and implement some appropriate programs to increase milk consumption as well as to regulate and implement policies to solve the problems of milk distribution. As a result of such educational programs, the community health will be improved.

Materials & Methods

Study design and participants: This descriptive study was conducted in Ardabil city of Iran in 2015-2016. The sample size was estimated at 300

[DOR: 20.1001.1.24767417.2020.5.3.1.0]
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people selected among healthy people with 18 years of age and over in both genders. Exclusion criteria included reception of supplements, lactose intolerance, pregnancy, and lactation. The data were obtained using unanimous questioners with open-ended and closed questions. The questioner contained two parts. The first part dealt about general information including demographic information such as householder and contributors' age, gender, educational status, and family average income per month. The second part included questions about consumption of milk, dairy products, and type of consumption. To evaluate the questionnaire's formal and content validity, some nutrition and health experts were asked to review and confirm the questions after their revisions were applied. The study data were collected in one step. To this end, 10 centres were selected from Ardabil health centres by random stratified sampling (Azadeghan, Pilehroodi, Bakeri, Ghanad emami, Seyed hatami, Razi, Artashafabakhsh, Emam hospital, Kowsar, and Loghman). To start data collection, an introduction letter was obtained from Ardabil University of Medical Sciences. The researcher attended the centres and provided the participants with the study goals and procedure. Later, the questionnaires were distributed among the participants by the researcher, so that they could ask any questions and the researcher could clarify the items if needed.

Data analysis: 300 people were selected using random sampling from Ardabil health centers and were asked to complete the questioners. The SPSS 19 software and Pearson correlation coefficient were used for data analysis.

Ethical considerations: To meet the ethical considerations of the research, we obtained a license from Ardabil University of Medical Sciences. This university provided the researchers with an introduction letter to carry out the study and to access the information in the health centers. Furthermore, written consent forms were obtained from the participants and they were explained about the study goals and instructions.

Results

According to **Table 1**, most participants were women aged from 30 to 50 years who lived mostly in urban area (80%). From 300 participants who referred to health centers, individuals who referred to Seyed Hatami Center and Azadegan Center had the highest and lowest contribution in responding the questions, respectively.

According to **Table 2**, pasteurized milk (51.7%) had the highest consumption rate and the number of people who did not consume milk was very low. As shows in **Table 2**, quality of the milk overcomes its price and brand. Most consumers' priority (87%) in buying a brand or type of milk was its quality. Mihan was the most popular brand and Damdaran was in the second place regarding the participants' viewpoints. The amount of milk needed by different people varies and the average milk consumption per week is about 2 liters for most people.

Pearson correlation coefficient shows a significant relation between the participants' educational level and their milk consumption rate. So, considering 99% confidence, a relationship was observed between the participants' level of education and milk consumption as well as between milk consumption and the level of education of the household head. In other words, no significant relationship was found between the education level of the household head and the amount of milk consumption. A significant difference was observed between 3 parameters of milk type, householders' age, and householders' educational level ($P < 0.05$). The results showed a significant relationship between the type of consumed milk and the household head's age ($P < 0.05$). No significant relation was observed between the household head's age and milk consumption ($P > 0.05$). Based on the results, a significant relationship was found between the respondents' educational level and their milk consumption with 95% confidence interval. However, milk consumption did not have a significant association with age and education level of the household head as well as the householders' age. Pearson test results **(Table 3)** show the

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effective factors on the type of consumed milk in Ardabil among participants, which include education level of the householders and household heads as well as the household heads' age. The householders' age was not effective on milk consumption. The householders' age and educational level were effective in the amount of milk consumption, but the household head's age and educational level were not effective on the amount of milk consumed by the householders.

Table 1. Demographic Information

Variables	N	%
Gender		
Male	101	33.7
Female	199	66.3
Life		
Rural	60	20.0
Urban	240	80.0
Age (year)		
Under 30	20	6.4
30 to 50	181	60.4
Over 50	99	33.2
Education		
Illiterate	15	5.0
Elementary	13	4.4
Middle school	21	7.0
High school	74	24.6
University	177	59.0

Table 2. Distribution of milk consumption based on the milk type, milk consumption priority and amount milk consumption

Variables	N	%
Type of consuming milk		
Raw	122	40.7
Pasteurize	155	51.7
Don’t consumption	9	3.0
Pasteurize and Raw	14	4.7
Total	300	100
Milk consumption priority		
Price	25	8.4
Quality	261	87.2
Brand	13	4.4
Total	299	100
Consumption milk amount liter per week		
≤ 1	43	14.3
2	92	30.7
3	54	18.0
4	14	4.7
5	75	25.0
6 ≤	22	7.3
Total	300	100

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Table 3. Pearson correlation coefficient for correlation determining

Variables	N	R	P-value[a]
Type of milk consumption with			
People' age	300	-0.097	0.095
Household head's age	298	-0.156	0.007
People's educational status	300	0.136	0.018
Household head's educational status	298	0.151	0.009
Amount of milk consumption with			
People's age	300	0.260	0.000
Household head's age	298	0.049	0.396
People's educational status	300	-0.178	0.002
Household head's educational status	298	-0.110	0.057

[a]: based on Pearson correlation.; R: Pearson correlation coefficient

Discussion

An important factor in choosing a milk type was its quality rather than price or brand. Considering the effects of milk consumption on the individuals' health, its hygiene should be preserved throughout the production and transportation process (Hojati *et al.*, 2013, Mousavi *et al.*, 2016). In the case of not employing heating methods, such as pasteurization and sterilization, consumption of raw milk causes some diseases such as tuberculosis, brucellosis (Typhoid fever), dysentery, and gastrointestinal tract inflammation. The heating process, such as pasteurizing, can eradicate all bacterial infections (Hojati *et al.*, 2013). Mirmiran et al. demonstrated that dairy products and milk consumption was half of the normal recommended level. This low consumption in Iran can be due to ethnicity, national, cultural, geological, personal, and social differences (Mirmiran *et al.*, 2003). Gilani in a vast national review indicated that the common type of milk was raw milk, which was mostly used in rural than urban areas (Gallup & Gilani, 2011). Other studies also showed a direct relationship between the family income and milk consumption. Consumption of packed and bottled milk increased with individuals' educational level (Auld *et al.*, 2002, Evans *et al.*, 2010). In England, 87% of the consumed milk was pasteurized and 8.7% was packed. The effective environmental factors in producing, processing, storing, and packing can determine the milk price and consumption request (Foster *et al.*, 2010). Today, milk is the cheapest and best organic protein in the household basket. In this regard, studies showed that the proteins derived from every kg of milk are more economic than other animal proteins (Ahadi *et al.*, 2013). A study was conducted on the effect of training on college students' attitude and performance towards dairy products and milk consumption in Yazd city. The results showed that the nutrition training program for milk and dairy product consumption had a positive effect on the students' awareness, attitude, and performance. So, due to the low level of girls' attitude, awareness, and performance, the researchers recommended training plans to enhance consumption of dairy products and milk among this population (Vakili *et al.*, 2007). Another study by Farzin reported that chain stores and markets had a minor role in milk distribution in Iran. Considering the short distance between milk production centers and the markets, the most important reason of cost difference was expensive costs of transportation and product corruption. The researchers of this study recommended the authorities to take some measures to reduce the cost of milk so that children, especially in deprived areas can facilitate consumption of dairy products. In this regard, they mentioned that supporting producers can help (Farzin, 2007). A study by Vahedi et al. was conducted on milk consumption awareness and milk consumption patterns among the primary school children and their mothers in Sari city from 2006 to 2007. The results illustrated that milk consumption in half of the studied population was lower than the recommended level

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(Vahedi *et al.*, 2007). In a study by Esfarjani et al., most individuals in west Azerbaijan consumed raw milk, while this consumption was lower than the recommended level. They found that the most important effective factors on milk consumption were living place, ethnicity, and socioeconomic status (Esfarjani *et al.*, 2014). Kaya investigated the consumers' tact and approach on pasteurized and sterilized milk and observed that the economic and cultural situations were effective on milk consumption (Kaya, 2016). De Alwis et al. showed that monthly income, health problems, and educational status affected the amount of milk consumption in Srilanka (De Alwis *et al.*, 2009). Soroush mentioned that the daily intake of dairy products was lower than the necessary level for calcium intake. This issue does not have a strong relationship with one's average income, but is mostly affected by the people's culture with regard to milk consumption. Iran's average ilk consumption rate is even lower than the Asian country's level (Soroush, 2008). The average amount of milk consumption in the western diet is about 250 ml per day for each person (William, 1998). Totally, this study demonstrated that the most commonly used milk type among Ardabil families was raw milk. The average weekly milk consumption in most people (30.7%) was about 2 liters. These amounts are less than the daily recommended amount that can have adverse effects on people's health status. To the best of our knowledge, this is the first study over the factors affecting the amount and type of milk consumption in Ardabil. Furthermore, the questionnaires were completed with a high response rate. Considering the study limitations, we can indicate that this research was conducted in one city among a small sample size. So, generalizability of the results should be performed with caution.

Conclusions

Milk and dairy products are among the most nutritious foods. A significant relationship was observed between the type of milk and people's educational level. In general, milk consumption is reduced by the aging process. To improve milk consumption status in Iran, the traditional distribution and consumption processes should be improved. To this end, people should be educated the media and governmental policies.

Acknowledgment

The authors acknowledge Ardabil University of Medical Sciences for their financial support. We also appreciate the staff working in Ardabil health centers for their help.

Authors' contributions

Alighadri M, Attarmadraki F and Shojapour A contributed in the study design and data collection. Gholami S contributed in the study design, data collection, data analyses, and manuscript preparation. Hashemi SY and Musazadeh V were involved in manuscript preparation. Gholinia B translated this manuscript into English. All authors read and approved the final manuscript.

Conflict of interest

The authors declare that there is no conflict of interest.

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[DOR: 20.1001.1.24767417.2020.5.3.1.0]

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