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ORIGINAL ARTICLE

The Families' Attitude and Awareness toward Consumption of Milk and Dairy Products in Ardabil, Iran

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ABSTRACT

Background: Infected and unpasteurized dairy is one of the most important ways to transfer zoonotic diseases like Malta fever. In order to prevent this disease, milk and dairy products should be pasteurized. The purpose of this study was to survey the awareness, attitude and people's function about milk and dairy products consumption in Ardabil, Iran.

Methods: In a descriptive randomized study, 300 people who came to health centers of Ardabil, Iran were enrolled. Data collection was undertaken by a questionnaire and analyzed.

Results: The correlation between participants' awareness about milk transmitted diseases and educational level, occupation, milk type and storing time and way of consumption were significant. No significant correlation was noticed between income and amount of milk consumption, disease transmission and method of milk boiling and storing and the boiling time, and educational level, and awareness about benefits of milk.

Conclusion: Common way for milk consumption among Ardabil families was drinking and its amount was lower than the recommended amount for each individual. The most important factors affecting milk consumption were educational level and job. It seems that designing and performing some policies and functional programs in order to increase the milk consumption as a culture should be considered.

Introduction

Dairy products like milk contain beneficial proteins, fat, vitamins and the required electrolytes that should be in a daily household basket. According to WHO per capita, consumption of 200 litters of milk and its derivatives per year is one of the effective factors on raising IQ level, life span and learning ability (1). Continuous researches about

dairy products demonstrated that there is a strong correlation between consumption of these products and people's health level (2). Average amount of daily milk consumption in western diet is estimated 250 mL for each person (3).

The ministry of health and medical education statistics illustrated that consumption of milk per capita in Iran was 35 L/year, while in world, the

average consumption is 350 L/year (4). Daily milk intake can provide 65% to 72% of adult calcium requirement (5). Milk and dairy products are the essential nutrients closest to a complete food with necessary elements for life such as high quality proteins, calcium and other essential minerals (6). Lack of knowledge about milk and its derivatives nutritional value among people and a true consumption pattern are important determinative factors in consumption of milk and other dairy products (7).

Reports from Management and Programing Organization of Ministry of Health and Medical Education of Iran and Food and Nutrition Committee denote to the obvious gap between our country and developed countries per capita for milk consumption revealing a low milk consumption in our country (8). Low consumption of milk and dairy products in Iran could be due to cultural, geographical, social and individual features and economical power of people as the most effective factor (9). It is obvious that determining the effective factors and their effect on demands for milk and dairy products could be a proper objective for administrative organizations to take appropriate policies in order to increase the demand and internal consumption of these products. It also can support policy makers and planners to predict the future status by evaluation of past policies to provide an accurate planning for a desirable condition (7).

The main reason for the low consumption of dairy products is false food information as one of the main nutritional and malnutrition complaints in Iran (10). The fast way to promote the people knowledge and according to WHO reports on maternal and neonatal health, it is necessary to enhance the parents awareness, especially for mothers (11). The milk consumption per capita would improve if people knowledge and awareness are increased in Iran, while consumption of dairy products has a special importance and position in Iranian table of foods (12).

Milk and dairy products are one of the important sources, which could be infected by biological agents. It is estimated that 70% of infectious diseases could be transmitted to human from unhealthy food and over 450 types of viral, fungal, parasitic and microbial diseases could be transmitted to human as zoonotic food sources regarding milk and dairy products as the major parts of these foods. If the production and distribution are not in line with hygienic methods and are not aseptic, it could cause transmission of zoonotic diseases and food poisoning (13).

Based on recent years reports indicating usage of industrial palm oil in milk and dairy products in dairy industries, it may cause an increase in people tendency to consume bulk and unpasteurized milk

leading to incidence of diseases such as Malta fever (14). Milk and dairy products are the major causes to zoonotic diseases, such as Malta fever (brucellosis) and to prevent the disease from dairy products, they should be pasteurized (15). Consumption pattern studies in Iran showed that more than 90% of people calcium intake is less than 70% and is also depicted that in adulthood, milk consumption is not enough due to lack of habit to consume milk during childhood (16).

Dairy intake pattern studies in women is more important than men, because the risk of osteoporosis in women is likely twice (17). According to the recent research, there is a high gap between the amount of milk consumption in household and optimal consumption in the country's nutritional basket. Milk is a main source for protein, vitamin B2, vitamin A, Vitamin E, Vitamin D and calcium. So as people's physical and economic access is diminished, it can have adverse effects on people health (18).

Choosing a balanced and suitable diet is affected by several factors such as sex, race, economic situation, milk taste, psychological factors and parent's acquaintance and they are effective on amount of milk consumption. So better and more accurate knowledge about these factors could help to make some plans to improve society food habits and increase their information about advantages of milk consumption (18). This study was performed to determine people's awareness and attitude about consumption of milk and dairy products in Ardabil University of Medical Sciences health centers. This study aims to recognize the weakness and strength points in order to improve the knowledge of society and prevent the diseases and help the managers to perform the effective programs.

Materials and Methods
In this descriptive study, members who referred to health centers were enrolled to investigate milk consumption in winter of 2016. The sample size for the study was 300 participants. To obtain the information, a questionnaire was used for information about demographic specifications in cluding participant's age, job, monthly average income, birth and living places, and numbers of family members. Second part involved 17 questions about awareness for benefits of milk consumption, milk associated (transmitted) diseases, proper way for milk boiling and storing, amount of milk purchase per week, milk boiling time, milk storing time and type of consumption milk.

To evaluate the questionnaire formal and content validity, some questionnaires were devoted to nutritional science and health experts

confirmed them and their opinions were considered. Information was provided in one step. Ten health centers from Ardabil were randomly selected (Azadeghan, Pilehroodi, Bakeri, Ghanad emami, Seyed hatami, Razi, Artashafabakhsh, Emam hospital, Kowsar, Loghman). An ethical approval letter for the study from Ardabil University of Medical Sciences was presented to the researchers and participants. Researchers distributed and collected the questionnaires. Obtained data were analysed by statistical software f SPSS (Version 23, Chicago, IL, USA) and Microsoft excel using Chi square, Kruskal-Wallis, Fisher exact and Pearson correlation coefficient tests. P value<0.05 was considered statistically significant.

Results

Totally 300 subjects from 10 centers were enrolled. Most of them (81.42%) were born at urban areas and lived there too. Milk consumption survey showed that 51.7% of them consumed pasteurized milk and 40.7% used bulk milk. Totally, 59% of participants were graduated, 24% had diploma and 16% were under diploma level. Among all of participants, 33.44% were housewife, 29% were self-employment, 24% were employee and 12% were student. Most of participants (30.3%) declared that they boiled milk for 10-20 minutes (Figure 1).
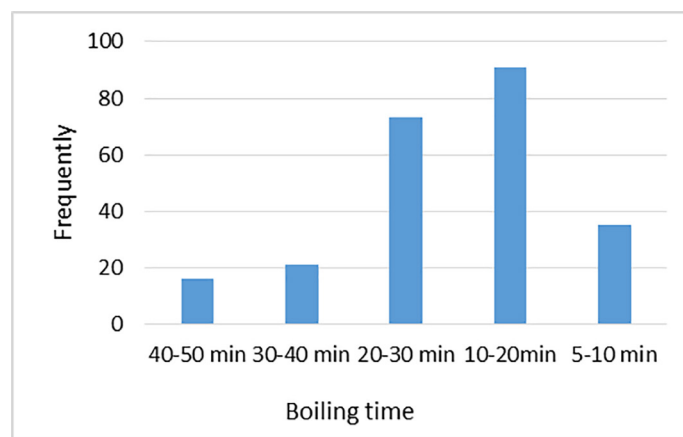
The maximum milk storing time among participants was 2 days with a frequency of 24% and the minimum milk storing time was 6 days (3.3%). The frequency of participants for milk storing time was shown in Figure 2. The majority of participants (47.7%) were familiar with Malta fever regarding bulk milk transmitted diseases. The diseases which people indicated were Malta fever and poisonings (5%), poisoning alone (3.7%), cow madness (Creutzfeldt-Jakob disease) (2.3%), Malta fever and tuberculosis (2%), Malta fever and Foot and Mouth disease (2%), Malta fever and cow madness (1.7%) and tuberculosis (1.7%).

However, people's attitude was evaluated moderate, even their attitude on transmissible disease from milk and dairy products was low; so half of them did not have a proper attitude toward transmissible diseases from dairy products. The frequency of participants regarding their knowledge about associated diseases from bulk milk was shown in Figure 3. The participants (43%) believed that most of transmitted diseases from milk and dairy products belonged to bulk milk and the least was related to pasteurized dough (1%) and natural yogurt (1%). Frequency of participants about their knowledge on possibility of disease transmission from dairy products was shown in Figure 4.

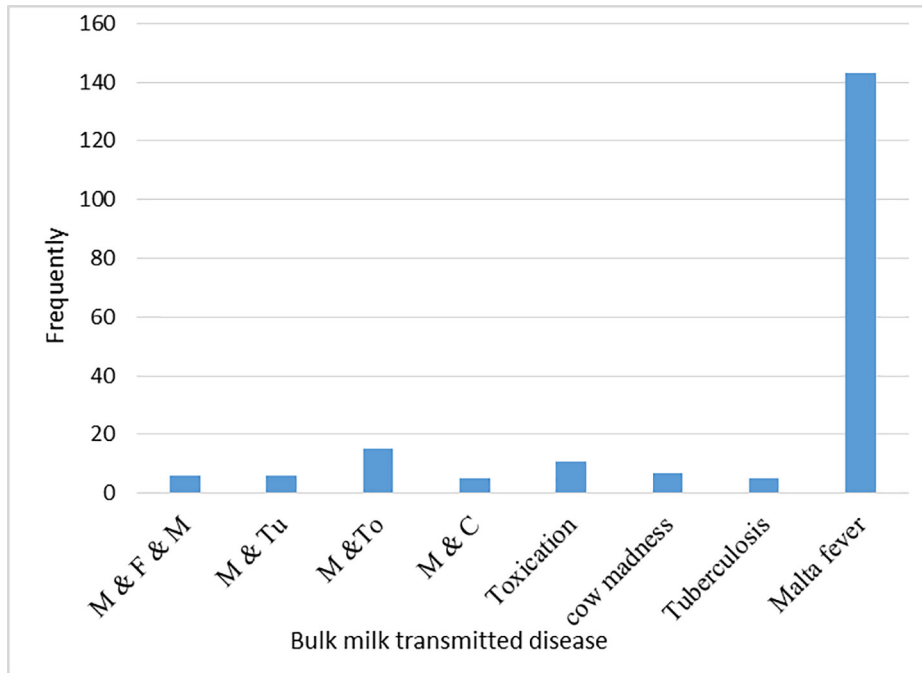Most of people (87%) used natural products such

Figure 1: The boiling time undertaken by people.
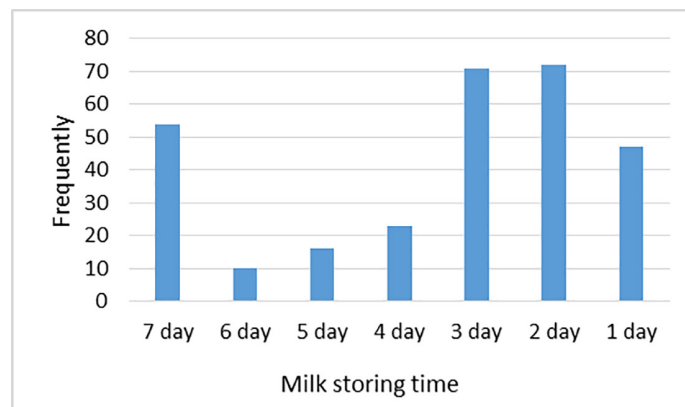
Figure 2: The milk storage time by participants.

Figure 3: The knowledge of subjects about diseases transmitted from bulk milk.
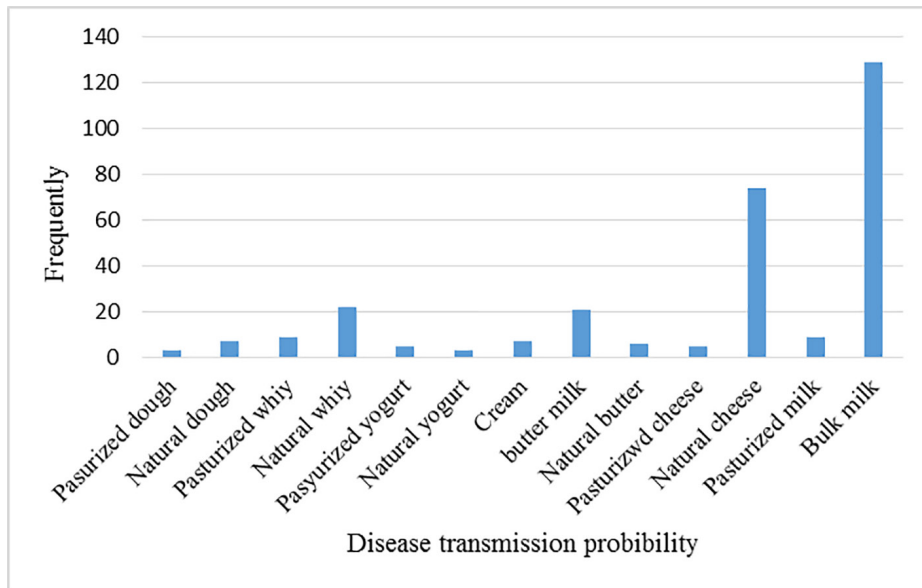

Figure 4: The probability of disease transmission from various dairy products among participants.

as bulk milk, natural cheese, natural (hand-made) butter, butter milk, natural yoghurt (hand-made) whey and natural dough instead of pasteurized products (12%); e.g. pasteurized milk, pasteurized cheese, cream, pasteurized butter, pasteurized yoghurt, pasteurized whey and dough. 30.3% of participants used Teflon ware, 24.3% used zinc ware, 8% used steel one, 7% used copper ware, 6.7% used cast iron ware and 1.3% used glass ware for boiling. The participants' responses to questions about used wares for boiling were shown in Table 1.

The majority of participants (27%) used glass ware for storing the milk and other wares which were used included plastics (12.7%), zinc (11%), Teflon (9.3%), porcelain (8%), steel (7.3%), copper (3.7%) and cast iron (3.7%). Participant's awareness was at an average level. The distribution of participants about milk storing ware has been shown in Table 2. The effective factors in priority of milk selection have been illustrated in Table 3. Among 3 factors (price, quality and brand), the quality was the most important factor (mean: 1.96) reported by participants. The correlation between factors affecting amount and type of milk consumption has been shown in Table 3.

Before studying and analysing each component, the normality test was performed. When the normality test was not established, non-parametric tests were used. The related results about correlations were presented in Table 4. The Pearson correlation

Table 1: The distribution of participants regarding using wares for boiling

Variable		Frequency	Percent	Valid percent	Cumulative percent
Valid	Teflon	91	30.3	39.1	39.1
	Zinc	73	24.3	31.3	70.4
	Copper	21	7.0	9.0	79.4
	Cast Iron	20	6.7	8.6	88.0
	Estill	24	8.0	10.3	98.3
	Glass	4	1.3	1.7	100.0
	Total	233	77.7	100.0	
Missing	System	67	22.3		
	Total	300	100.0		

Table 2: The distribution of participants in relation to milk storage ware

Variable		Frequency	Percent	Valid percent	Cumulative percent
Valid	Steel	22	7.3	9.5	9.5
	Plastic	38	12.7	16.4	25.9
	Glass	81	27.0	34.9	60.8
	Zinc	33	11.0	14.2	75.0
	Teflon	28	9.3	12.1	87.1
	Copper	11	3.7	4.7	91.8
	Cast Iron	11	3.7	4.7	96.6
	porcelain	8	2.7	3.4	100.0
	Total	232	77.3	100.0	
Missing	System	68	22.7		
	Total	300	100		

Table 3: The correlation between factors affecting amount and type of milk consumption among participants

Variable	Number	Mean	Median
Price	299	1.54	2.00
Quality	299	1.96	2.00
Brand	300	1.50	1.00

coefficient test results between average income and amount of milk purchasing was not significant (P=0.33) denoting to a weak correlation between income and milk purchasing amount (-0.057). Chi square test was used to determine the relation between participants information about milk transmitted diseases and their educational level that was statistical significant (P=0.003). Among those under diploma level, just 22 people had information and among graduated participants, 124 subjects had information and the difference was not significant (P=0.18). Kruskal–Wallis test was used to study the correlation between milk storage time and its consumption with a statistical significant difference (P=0.004).

In other words, milk storage time in different groups (from the aspect of type of milk consumption) was not the same (Table 1). The results depicts that the most storage time was for bulk milk and the least referred to pasteurized one. Chi squared was applied to survey the correlation between milk boiling time and participants' educational status and the difference was not significant (P=0.32), so the boiling time was not correlated to people's educational level. The correlation between ware use for boiling and participants' educational level was not significant (P=0.09). So the selection for boiling the milk was not correlated to the person's educational level. The correlation between ware use for storage of the milk and participant's educational level was not significant (P=0.14) and it means that using wares for milk storage was identical for all three educational levels.

There was not any correlation between used ware to store the milk and people's educational level (P=0.65). The correlation between awareness about diseases transmitted from milk and participants' job was highly significant (P=0.001) and it means that knowledge about milk transmitted diseases were different in various jobs. The correlation between type of purchased milk and participants' job was not significant (P=0.21). The correlation between the type of milk consumption and participants' educational level was significant (P=0.002).

Table 4: The correlation between frequency and variables of the study

Related test	Number	Test	Test statistics	Degree of freedom	P value	Reject/ Approved
Average income/milk purchase	297	Pearson correlation coefficient	-0.057	-	0.331	Reject
Knowledge about bulk milk transmitted diseases/ Participant's educational status	288	Chi squared	11.906	2	0.003	Approve
Transmission probability from dairy products/Participant's educational level	300	Chi square	3.446	2	0.179	Reject
Milk storage time/Type of milk	291	Kruskal-Wallis	11.228	2	0.004	Approve
Boiling time/Participant's educational status	236	Chi square	7.027	6	0.318	Reject
Use of ware for milk boiling/ Participant's educational level	233	Fisher exact test	15.508	-	0.085	Reject
Use of ware for milk storage/ Participant's educational level	232	Chi square	14.757	10	0.141	Reject
Knowledge about milk type/ Participant's job	295	Chi square	1.650	3	0.648	Reject
Information about milk transmitted diseases/ Participant's job	287	Chi square	16.315	3	0.001	Approve
Type of milk/Participant's job	299	Chi square	12.095	9	0.208	Reject
Type of milk/Educational level	300	Chi square	20.405	6	0.002	Approve

Discussion

Knowledge about milk and dairy products was different among participants. Many researches have confirmed similar results. The results of this research showed that correlation between educational level and awareness about probability of disease transmission from dairy products, boiling time, the ware for boiling and storage was not significant, but the correlation between knowledge about milk transmitted diseases and participants' job, storage time and type of milk consumed was significant. In a study by Alwis et al. in 2011 that analysis of effective factors on fresh milk among consumers in middle of Sri Lanka has undertaken, it was shown that monthly income and health complications and educational level affected the amount of milk consumption (19).

The results of this research showed that the correlation between average income and amount of milk purchased was not significant similar to other studies. A cross sectional study about milk consumption and prevalence of correlated disorders done by Soroush in one of the army medical university hospital in Tehran (2008) and dormitories residents demonstrated that the daily consumption of dairy products was less than the required amount for calcium intake. This subject did not have any correlation between the average income and there was not an acceptable culture of milk consumption among people (4). On the other hand, some researchers illustrated unsuitable nutrition in low income mothers to be correlated with their purchasing power and preparing the food materials (20).

The most important effective factors about milk consumption in India is culturalal-religious issues, but the government by decreasing import, support the dairy producers and exporters and encourage investment in this part showing an improving trend. It is estimated that 10% of Indian are wealthy, consume 30% of all produced milk, while 30% of them are poor and just consume 10% of the produced milk in India. This topic depicts the direct correlation between income and milk consumption in Indian families. The positive point of this study is comparison of the milk consumption between 2 groups of low and high income that showed the necessity of planning to increase the milk consumption in low income population (21).

In a study by Mohammadi Nasrabadi in 2013 on the effect of targeted subsidies and the cash payment on families food safety in Tehran urban population showed that milk and dairy consumption has decreased in low income areas and milk purchase and consumption have changed due to increase in the prices (22). In England, the effective

environmental factors about production, processing, storage and packing could influence the price and milk consumption needs (16). Keyghobadi et al. (2003) in a study on mothers and children nutritional status in rural parts in Kerman (Iran) found that 80% of mothers had low or moderate information about main food groups showing a close correlation between malnutrition and poverty (23).

The difference between the awareness about bulk milk transmitted diseases and educational level was statically significant similar to other studies. Nakhshab et al. in a study on prevalence of malnutrition and effective factors in children under 2 years old in Sari, Iran concluded that the main reason of malnutrition was not lack of food, but other factors such as cultural, lack of health services, infection prevention measures and misuse of foods influencing the children's growth time regarding malnutrition (24).

In a study by Hatakka et al. in 2001 in Helsinki to find the important factors for consumption of milk and its derivatives, they showed that parents' awareness about complications and problems of consumption of milk and its derivatives was important; in a way that educated parents tried to pay the most of family income to provide children physical and psychological health (25). The participants' education was in different educational levels and different attitude toward milk and dairy products which was statically significant. In Kaheni et al.'s study, there was a significant correlation between amount of consumption of milk and its derivatives and mother's and father's educational levels (26).

In this study, people declared several sources for their knowledge including television (51.3%), internet (17.7%), and newspaper and magazine (7.7%). Baghiani-moghadam et al. reported that 74.4% of pregnant women received information about pregnancy nutrients from media (38.6%), 37.6% from doctors (physicians) and 37% from relatives. Sajadi and colleagues reported that pregnant mothers received information about food and nutrients from health providers (32%), and radio and television (29.6%). In our study, the most type of milk consumption was for drinking (69.3%). Faghih et al. reported in Hormozghan families that the most consumed dairy product was milk and the least was dough (6).

In the present study, the correlation between type of milk and educational level was significant. Sajadi et al. demonstrated that increase in educational level increased the nutritional knowledge with a significant correlation between educational level and nutritional knowledge (27). In a study in Tabriz, Iran in 2007 by Yusefpoor et al., a significant correlation was noted between mother's educational status and students' information, but the correlation between type of milk and participants' job was not significant (28).

Pendarianzadeh in a study in 1994 in Kerman rural area found that increase in educational level caused an increase in awareness level, but the correlation was not significant (29). In Bordbar's study, there were variables such as age, sex, educational status, parent's job and family size and nutritional knowledge (30). A significant correlation was noticed between people' knowledge and their job. So educated people had a higher level of knowledge in comparison with household ones. Despite the proper information of people about the risk of consumption of bulk milk and dairy products and possibility of Malta fever similar to other studies results (16, 31), they used these products. In another study, most of people did not believe in risk of disease and consumption of bulk milk (32).

The main problems related to infected milk sources were tuberculosis and brucellosis caused by *Mycobacterium tuberculosis* and *Brucella melitensis*, respectively. There are dangers of other bacteria like salmonella and *Campylobacter jejuni* in bulk milk and the effective way to control them is pasteurization. In addition, some actions should be undertaken such as public health education, avoid of insanitary methods in food processing and avoiding consumption of bulk and unpasteurized dairy products and controlling the carrier regularly that can effectively prevent dangerous poisonings and botulism (33).

Conclusion

Our findings demonstrated that milk and dairy products had little contribution in food baskets. Also, the knowledge and attitude of people toward milk and dairy products and transmitted diseasess were moderate. Today's milk consumption in each society is one of the important factors in cultural development as mothers' food and drink selections and their awareness and performance are important especially for consumption of dairy products. They have a determining role in protein and minerals intake, so informing them about milk and dairy products consumption is necessary and planning is needed for functional programs and policies to increase milk consumption. To solve the problem of milk distribution and consumption, school milk redistribution, increasing milk subside by the government, rising the society's reliance and culture on dairy products by media and policy makers and the government seems necessary.

Acknowledgment

Conflicts of Interest

None declared.

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