

Do adults and older people follow current guidelines for milk consumption?

Renata Luz^{1,*}, Marilisa Berti de Azevedo Barros¹, Daniela de Assumpção¹, Semíramis Martins Álvares Domene² and Antonio de Azevedo Barros Filho³

¹Departamento de Saúde Coletiva, Faculdade de Ciências Médicas, Universidade Estadual de Campinas, 126 Tessália Vieira de Camargo St, 13083894 Campinas, São Paulo, Brazil; ²Departamento de Saúde, Clínica e Instituições, Universidade Federal de São Paulo, Santos, SP, Brazil; ³Departamento de Pediatria, Faculdade de Ciências Médicas, Universidade Estadual de Campinas, Campinas, SP, Brazil

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Abstract

Objective: To estimate the prevalence of frequent milk consumption (\geq five times/week), the consumption of low-fat/skimmed milk and associated factors in adults and older people, evaluating adherence to current Brazilian guideline.

Design: Population-based cross-sectional study involving the analysis of data from the 2015 Campinas Food Intake and Nutritional Status and 2015 Campinas Health Survey. The prevalence of milk consumption was analysed according to socio-economic characteristics, morbidities and health-related behaviours.

Setting: City of Campinas, state of São Paulo, Brazil.

Participants: A sample of 1710 participants of the 2015 Campinas Nutritional and Health Surveys.

Results: A total of 73·8 % of the population consumed milk, but the prevalence of frequent consumption was only 44·0 %. Frequent milk consumption was higher among women, older people and individuals with better diet quality. A total of 18·4 % of the individuals who consumed milk reported consuming low-fat/skimmed milk; this prevalence was higher among women, individuals with a higher socio-economic status, those with better diet quality and those with chronic diseases.

Conclusion: Despite the high nutritional quality of milk and the different types available on the market, adults and older people do not follow current recommendations regarding its consumption. Information on the nutritional quality of milk and current recommendations should be disseminated more at healthcare services.

Keywords
Milk
Food intake
Adults
Older people
Health surveys

Milk is recognised for its nutritional quality, as it contains proteins of high biological value, significant quantities of vitamin A and B complex vitamins⁽¹⁾ and is an important source of Ca, which is essential to bone formation and maintenance as well as the regulation of neuronal function⁽²⁾. The main carbohydrate in milk is lactose, which contributes to the intestinal absorption of Ca, Mg and P⁽¹⁾. The highest concentration of fat in whole milk is saturated (75 %) and contributes to the absorption of liposoluble vitamins, cholesterol and carotenoids⁽¹⁾.

Milk consumption is indicated for individuals to reach the daily recommendation for Ca, which is stipulated to be 1000 mg for adults and 1200 mg for older people⁽³⁾. Besides being an important nutrient for bone formation and maintenance⁽⁴⁾, Ca has been recognised

in several meta-analyses for lowering the risk of rectal cancer⁽⁵⁾, obesity⁽⁶⁾ and type II diabetes mellitus⁽⁷⁾. Despite all these properties, questions are raised regarding milk consumption by adults and older people, especially due to the possibility of lactase non-persistence, allergy to milk protein, as well as an increased risk of prostate and ovarian cancer^(8,9) and diseases related to saturated fat intake^(10,11).

The prevalence of lactase non-persistence in the world population is estimated to be 70 %^(1,12). However, this rate varies considerably among countries, ranging from 5 % in northeastern Europe⁽¹³⁾ to approximately 100 % in Asia and the Middle East⁽¹⁴⁾. In Brazil, a study conducted with adults estimated the prevalence of lactase non-persistence to be 57 % among whites and 80 % in

*Corresponding author: Email nutri.renataluz@gmail.com

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the black population⁽¹⁵⁾. In contrast, the estimated prevalence of allergy to milk protein among adults in the world is < 0·5 %⁽¹⁶⁾.

As whole milk has a high saturated fat content, dietary guides in different countries⁽¹⁾ recommend that adults and older people consume low-fat versions to reduce the risk of developing CVD^(10,11). However, this recommendation has been questioned, as recent meta-analyses and cohort studies have shown that there is no clear, consistent evidence that the saturated fat in milk is a risk factor for an increase in the incidence of CVD or mortality due to such diseases^(17–22).

Several types of milk are available on the Brazilian market, such as A, B, C and ultra-high temperature, which differ in terms of requirements of hygiene, milking and transportation⁽²³⁾. Type A is a milk of excellent microbiological quality being pasteurised and packed in the farm⁽²³⁾. Type B is a milk of good microbiological quality, but with higher levels of micro-organisms due to the time interval between milking (performed in the farm) and pasteurisation (performed in dairy products plants)⁽²³⁾. Type C is a milk of low microbiological quality because it is transported to dairy products plants at room temperature⁽²³⁾. Ultra-high temperature milk undergoes a process of heating, sterilisation and cooling ensuring the elimination of all micro-organisms⁽²⁴⁾. Ultra-high temperature milk is available in the types of whole milk (3% fat or more), reduced fat (0·6 and 2·9%) and skimmed ($\leq 0\cdot5$ % fat) as well as lactose-free, low-lactose, enriched with Ca, Fe, vitamins, collagen or fibre, and flavoured⁽²⁴⁾.

Considering the nutritional quality of milk, questions regarding its consumption by adults and older people, the diversity of available products and the few studies evaluating whether milk consumption meets the recommendations of Brazilian dietary guideline⁽²⁵⁾, the aim of the present study was to estimate the prevalence of milk consumption and identify factors associated with frequent milk consumption and the consumption of low-fat/skimmed milk among adults and older people, evaluating adherence to existing guideline⁽²⁵⁾.

Methods

A population-based cross-sectional study was conducted with data from the 2015 Campinas Food Intake and Nutritional Status Survey and the 2015 Campinas Health Survey conducted in the city of Campinas, state of São Paulo, Brazil. The respondents were community-dwelling residents of urban areas of the city, divided into three age domains: adolescents (10–19 years), adults (20–59 years) and older people (60 years or older). In the present study, we only considered adults and older people, totaling a sample of 1710 individuals.

The aim of the 2015 Campinas Health Survey was to analyse living and health conditions of the population.

The sample was obtained using probabilistic, stratified, two-stage, cluster sampling. Seventy census sectors were selected in the first stage and households were selected in the second stage. The sample sizes were calculated considering an estimated proportion of 0·05, a 95 % CI ($z = 1\cdot96$), sampling error of 4–5 percentage points and a design effect of 2. The minimum sizes were defined as 1400 for adults and 1000 for older people. Assuming response rates of 78 and 80 %, respectively, 929 households were selected for interviews with adults and 2853 were selected for interviews with older people. In each household, interviews were held with all residents in the age domain for which the household was selected⁽²⁶⁾. The information was collected by trained interviewers through direct interviews with the selected individuals with the aid of an electronic device (tablet).

The 2015 Campinas Nutrition Survey was conducted with the same sample as the health survey. Information was collected on food consumption and nutritional status involving a 24-h recall and questions addressing the frequency of certain foods, self-reported weight and height, body perception, self-rated diet quality, practices developed for weight loss, etc. Trained interviewers through direct interviews collected the information with the selected individuals with the aid of a questionnaire. The data were entered into a databank developed using the EpiData 3.1 program (EpiData Assoc.).

Variables

The dependent variables for the current study (taken from the 2015 Campinas Nutrition Survey) were (a) frequent consumption (five to seven times per week) of milk (any type) and (b) the consumption of low-fat/skimmed milk among the individuals who reported consuming milk. The choice of dependent variables considered the recommendation of the Brazilian current dietary guide⁽²⁵⁾, which does not establish the amount of daily milk intake but encourages the frequent consumption of *in natura* and minimally processed products such as milk and its derivatives, giving preference to low-fat/skimmed milk⁽²⁵⁾.

The following sets of variables were considered for the analysis of associated factors:

- Demographic and socio-economic variables: sex, age, self-declared race/skin colour, family income *per capita* (using the Brazilian monthly minimum wage as the unit of analysis) and schooling (in years of study).
- Health-related behaviours: smoking, frequency of alcohol intake and physical activity in the leisure context. The latter variable was evaluated using the International Physical Activity Questionnaire and the participants were categorised as active (at least 150 min per week distributed among at least 3 d), insufficiently active (not meeting the requirements for the active category) or inactive (no physical activity in the leisure context)⁽²⁷⁾.

- Food frequency: obtained by the food frequency questions of the 2015 Campinas Nutrition Survey, from which the following were selected: legumes, raw and cooked vegetables, whole foods and fruit. Frequency was categorised as < five times per week or \geq five times per week.
- Self-rated health: categorised as excellent/very good/good or regular/poor/very poor.
- Number of chronic diseases on the following checklist: hypertension, diabetes, angina, myocardial infarction, arrhythmia, other heart diseases, cancer, rheumatism/arthritis/arthrosis, osteoporosis, asthma/bronchitis/emphysema, rhinitis/sinusitis, tendinitis/repetitive strain injury/work-related musculoskeletal disorder and vascular problems.
- BMI: calculated from self-reported weight and height. The cut-off points recommended for adults⁽²⁸⁾ and older people⁽²⁹⁾ were used and the categories were underweight, ideal weight, overweight and obesity.

Associations between the dependent and independent variables were evaluated using the χ^2 test with the Rao-Scott correction. Poisson multiple regression analysis was used for the calculation of prevalence ratios and respective 95% CI adjusted by sex and age. A hierarchical Poisson regression model was created using the stepwise backward method in two steps. In the first step, the socio-demographic variables with a *P*-value < 0.20 in the bivariate analysis were incorporated into the model and those with a *P*-value < 0.05 after the adjustments remained in the model. In the second step, the clinical and behavioural variables with a *P*-value < 0.20 in the bivariate analysis were incorporated into the model with the variables that remained in the first step and those with a *P*-value < 0.05 after the adjustments remained in the final model. The statistical analyses were performed with the aid of the Stata 14.0 program (Stata Corp.), which enables considering weights resulting from the sampling process.

Results

Among the households selected for interviews with adults and older people, the non-response rate was 8.7% due to refusals and other reasons. Among the adults and older people identified to be interviewed in the households, the refusal rate was 21% and loss rate for other reasons rate was 1.8%. During the 2015 Campinas Nutrition Survey, there was an additional loss rate of 13.2%. Thus, the sample analysed in the present study was composed of 1710 adults and older people.

Mean age was 44 years (95% CI 42.5, 45.4). The sample was composed predominantly of women (52.7%), individuals with self-declared white skin colour (68.0%), individuals with < 9 years of schooling (41.0%), individuals with a family income *per capita* less than the Brazilian monthly

minimum wage (35.0%) and individuals without private health insurance (52.5%). Based on the BMI, 41.7% of the sample were in the ideal weight range, 33.5% were overweight and 21.5% were obese (data not presented in tables).

A total of 26.2% (95% CI 23.2, 29.4) of the sample did not consume milk, 29.8% (95% CI 26.1, 33.5) consumed milk four times per week or less and 44.0% (95% CI 39.5, 48.7) consumed milk five to seven times per week. Among those who consumed milk, 81.1% (95% CI 76.9, 84.7) drank whole milk, 18.4% (95% CI 14.8, 22.6) drank low-fat/skimmed milk and 0.5% (95% CI 0.17, 1.2) drank lactose-free milk. Individuals who drank soya milk, who accounted for 0.8% (95% CI 0.4, 1.6) of the overall sample, were not counted as milk consumers. Among those who reported drinking low-fat/skimmed milk, 76.2% (95% CI 67.1, 82.1) consumed it five to seven times per week (data not presented in tables).

The prevalence of frequent milk consumption (five to seven times per week) was significantly higher among women and older people. The prevalence of low-fat/skimmed milk consumption was higher among women, individuals with 12 or more years of schooling and those with an income *per capita* of the Brazilian monthly minimum wage or higher. The prevalence of low-fat/skimmed milk consumption was lower among individuals with self-declared black or brown skin colour (Table 1).

Frequent milk consumption (five to seven times per week) was not associated with health status and morbidities variables. Low-fat/skimmed milk consumption was lower among underweight individuals and increased gradually with the increase in the number of chronic diseases (Table 2). Among the individuals who reported drinking low-fat/skimmed milk, 68.4% (95% CI 51.9, 78.2) had some type of CVD (data not presented in tables).

The prevalence of frequent milk consumption was lower among inactive individuals and smokers and higher among those who reported the frequent consumption of vegetables, whole foods and fruit. The prevalence of low-fat/skimmed milk consumption was lower among smokers and higher among individuals who consumed vegetables, whole foods and fruit five or more times per week and those who consumed alcoholic beverages two or more times per week (Table 3).

In the final model of frequent milk consumption of any type, the significantly associated variables were sex, age group and the frequent ingestion of whole foods and fruit (Table 4). In the final model of low-fat/skimmed milk consumption, the significantly associated variables were sex, schooling, family income *per capita*, number of chronic diseases and the frequent ingestion of whole foods and fruit (Table 5).

Discussion

The present findings reveal that, although milk is rich in proteins, vitamins and minerals and the market offers

Table 1 Prevalence and prevalence ratios of frequent milk consumption (five to seven times per week) and low-fat/skimmed milk consumption according to demographic and socio-economic characteristics. Campinas, SP, Brazil, 2015

Variables	n	Frequent milk intake (%)	PR	95 % CI	Milk intake (n)	Low-fat/skimmed milk (%)	PR	95 % CI
Sex		P = 0.0255				P = 0.0002		
Male	719	40.3	1		521	12.4	1	
Female	991	47.4	1.2	1.0, 1.3	775	23.3	1.9	1.3, 2.6
Age group		P = 0.0111				P = 0.1297		
20–39	443	37.7	1		331	15.5	1	
40–59	423	46.5	1.2	0.9, 1.6	301	20.0	1.3	0.9, 1.9
60 or older	844	54.9	1.4	1.2, 1.8	664	22.3	1.4	0.9, 2.1
Race/colour		P = 0.1830				P = 0.0010		
White	1157	45.6	1		882	21.7	1	
Brown/black	553	40.7	0.9	0.8, 1.1	414	11.3	0.5	0.4, 0.8
Schooling		P = 0.7237				P < 0.0001		
0–8	996	45.8	1		762	12.6	1	
9–11	357	42.4	1.1	0.9, 1.2	269	12.1	1.3	0.8, 2.1
12 or +	356	43.4	1.1	0.9, 1.4	265	31.1	3.2	2.3, 4.5
Income*		P = 0.3089				P = 0.0016		
< 1 BMMW	599	40.8	1		596	9.7	1	
≥ 1 BMMW	1111	44.4	1.1	0.9, 1.3	700	22.4	2.4	1.4, 4.0

n, number of individuals in unweighted sample; PR, prevalence ratio adjusted by sex and age; BMMW, Brazilian monthly minimum wage.

*Family income *per capita*.

Table 2 Prevalence and prevalence ratios of frequent milk consumption (five to seven times per week) and low-fat/skimmed milk consumption according to health status and morbidities. Campinas, SP, Brazil, 2015

Variables	n	Frequent milk intake (%)	PR	95 % CI	Milk intake (n)	Low-fat/skimmed milk (%)	PR	95 % CI
BMI (kg/m^2)		P = 0.3578				P = 0.6162		
Ideal	633	46.7	1		478	21.4	1	
Underweight	109	48.9	0.9	0.7, 1.2	80	15	0.6	0.3, 0.9
Overweight	462	40.8	0.9	0.7, 1.1	345	19.2	0.9	0.5, 1.6
Obesity	313	42.3	0.9	0.7, 1.1	232	16.8	0.8	0.5, 1.2
Self-rated health		P = 0.8987				P = 0.2791		
Excellent/very good/good	1230	44.2	1		926	17.5	1	
Regular/poor/very poor	474	43.6	0.9	0.8, 1.1	362	21.8	1.1	0.8, 1.6
No. of chronic diseases		P = 0.0889				P < 0.0001		
0	398	40.1	1		293	9.4	1	
1–2	605	43.1	0.9	0.8, 1.2	456	18.8	1.9	1.2, 3.2
3 or +	619	49.8	1.0	0.8, 1.3	482	28.9	2.7	1.8, 4.3

n, number of individuals in unweighted sample; PR, prevalence ratio adjusted by sex and age.

several options to meet the specific needs of individuals, the population studied does not consume this product in compliance with current guidelines. A total of 26.2 % reported not consuming milk at all, 29.8 % did not consume it frequently (< five times per week) and only 44 % consumed it frequently (five to seven times per week). Moreover, low-fat/skimmed milk consumption was reported by only 18.4 % of the individuals who drank milk.

Studies on frequent milk intake in Brazil are still scarce^(30,31). The low prevalence of frequent milk intake (five to seven times per week) was also evaluated in only two other Brazilian studies conducted in the city of Pelotas (46.2 %)⁽³¹⁾ and in the municipality of Palmeira das Missões (32.6 %)⁽³⁰⁾, both in Rio Grande do Sul. According to 2008–2009 Brazilian Family Budget Survey (POF 2008–2009)⁽³²⁾, only 17 % of the Brazilian population reported milk consumption in the food diary, showing its low consumption in the country. Regarding milk derivatives, the POF 2008–2009 showed that only 13.5, 4.1 and 1.2 % of the individuals reported consuming cheeses, yogurts and other milk products, respectively⁽³²⁾.

Frequent milk consumption (five to seven times per week) and low-fat/skimmed milk consumption were significantly higher among women. These findings have also been reported in other studies conducted in Brazilian cities and other countries^(31,33–36). The higher prevalence in women may be attributed to greater concern with regard to health, a greater adoption of healthy habits^(37,38) and, in part, the greater incidence of osteoporosis⁽³⁹⁾ compared with men. Indeed, studies report a considerable difference in the prevalence of osteoporosis between the sexes, ranging from 9 to 38 % among women and 1 to 8 % among men⁽⁴⁰⁾.

Frequent milk consumption and low-fat/skimmed milk consumption were higher among individuals who reported consuming whole foods and fruit with greater frequency. Individuals concerned with having a healthy diet prefer consuming foods *in natura* and minimally processed foods, such as milk, fruit, vegetables, legumes and whole grains, and avoid highly processed products, such as soft drinks, ready-to-heat foods, sweetened beverages and foods rich in fat^(41,42). No previous studies have evaluated

Table 3 Prevalence and prevalence ratios of frequent milk consumption (five to seven times per week) and low-fat/skimmed milk consumption according to health-related behaviours and diet quality. Campinas, SP, Brazil, 2015

Variables	n	Frequent milk intake (%)	PR	95 % CI	Milk intake (n)	Low-fat/skimmed milk (%)	PR	95 % CI
Physical activity at leisure		P = 0.0390				P = 0.1577		
Active	492	50.2	1		377	21.9	1	
Inactive	1218	41.7	0.9	0.7, 1.0	919	17.0	0.8	0.6, 1.1
Smoking		P = 0.0434				P = 0.0135		
Non-smoker	1184	45.1	1		916	20.0	1	
Ex-smoker	298	48.3	1.0	0.8, 1.2	229	20.1	1.0	0.7, 1.5
Smoker	228	35.4	0.8	0.6, 0.9	151	7.5	0.4	0.2, 0.9
Frequency of intake:								
Alcohol		P = 0.3402				P = 0.4895		
Never	1209	45.6	1		941	17.0	1	
1× week	330	42.6	0.9	0.8, 1.5	243	20.8	1.4	0.9, 2.1
≥ 2× week	171	37.9	0.9	0.6, 1.2	112	21.8	1.8	1.0, 3.0
Vegetables and legumes		P = 0.0039				P = 0.0039		
< 5× week	440	36.0	1		298	10.3	1	
≥ 5× week	1269	47.1	1.3	1.1, 1.5	995	21.0	1.9	1.2, 3.2
Whole foods		P = 0.0002				P < 0.0001		
< 5× week	1439	41.6	1		1088	14.1	1	
≥ 5× week	271	57.6	1.4	1.1, 1.6	206	41.5	2.8	2.0, 3.7
Fruit		P < 0.0001				P < 0.0001		
< 5× week	635	34.7	1		448	9.0	1	
≥ 5× week	1075	51.3	1.4	1.2, 1.6	846	24.7	2.5	1.6, 3.8

n, number of individuals in unweighted sample; PR, prevalence ratio adjusted by sex and age.

Table 4 Hierarchical Poisson regression model of factors associated with frequent milk consumption (five to seven times per week). Campinas, SP, Brazil, 2015

Variables	First step*		Second step†	
	PR	95 % CI	PR	95 % CI
Sex				
Male	1		1	
Female	1.2	1.0, 1.3	1.1	0.9, 1.3
Age group (in years)				
20–39	1		1	
40–59	1.2	0.9, 1.6	1.2	0.9, 1.5
60 or +	1.4	1.2, 1.8	1.3	1.1, 1.7
Whole foods				
< 5× week		1		
≥ 5× week		1.3	1.1, 1.5	
Fruit				
< 5× week		1		
≥ 5× week		1.3	1.1, 1.6	

PR, prevalence ratio.

*First step: prevalence ratio adjusted by socio-economic and demographic variables.

†Second step: prevalence ratio adjusted by health-related behaviours and morbidities.

the association between the consumption of this type of milk and the frequent consumption of other foods.

The more frequent consumption of milk among older people than adults is in agreement with data reported by other researchers^(31,35) and is partially linked to a generation effect, as older people had less access to sweetened beverages in childhood and milk consumption was more frequent^(31,35). It has also been reported that older individuals who live alone end up replacing large meals for snacks that usually include the use of milk⁽³⁵⁾ and that problems with chewing, which are more frequent with the advance of the ageing process, lead to an increase

Table 5 Hierarchical Poisson regression model of factors associated with low-fat/skimmed milk consumption. Campinas, SP, Brazil, 2015

Variables	First step*		Second step†		
	PR	95 % CI	PR	95 % CI	
Sex					
Male	1		1		
Female	1.9	1.3, 2.7	1.4	1.0, 1.9	
Schooling (in years)					
0–8		1		1	
9–11		1.2	0.7, 1.9	1.1	0.7–1.7
12 or +		2.9	2.0, 4.2	2.3	1.6, 3.3
Income per capita					
< BMMW		1		1	
≥ BMMW		1.8	1.1, 3.0	1.6	0.9, 2.7
No. of chronic diseases					
0			1		
1–2			1.6	0.9, 2.7	
3 or +			2.2	1.4, 3.4	
Whole foods					
< 5× week			1		
≥ 5× week			2.1	1.4, 2.9	
Fruit					
< 5× week			1		
≥ 5× week			2.3	1.4, 3.6	

PR, prevalence ratio; BMMW, Brazilian monthly minimum wage.

*First step: prevalence ratio adjusted by socio-economic and demographic variables.

†Second step: prevalence ratio adjusted by health-related behaviours and morbidities.

in the consumption of pasty foods and liquids, such as milk⁽⁴³⁾.

Among the milk consumers, 81.1% reported drinking whole milk, which is similar to rates described in previous Brazilian studies^(30,31,44). According to Casarotti *et al.*⁽⁴⁵⁾, fat is considered a fundamental component for the sensorial

aspects of food, enhancing flavour, creaminess, appearance, aroma and the sensation of satiety after consumption. Thus, the greater presence of fat may make whole milk more appreciated than low-fat or skimmed milk⁽⁴⁵⁾.

Dietary guidelines in most countries, including Brazil, counsel adults and older people to consume dairy products with low-fat content⁽¹⁾ due to evidence of an increase in serum cholesterol and the incidence of CVD caused by the consumption of saturated fat^(10,11). Considering the results of the present study, however, this advice is apparently not heeded much, as only 18·4 % of the adults and older people who drank milk consumed low-fat/skimmed milk, which is similar to the rates found in studies conducted in the cities of Pelotas (19·5 %)⁽³¹⁾ and Palmeira das Missões (13·9 %)⁽³⁰⁾ in the state of Rio Grande do Sul, Brazil.

Low-fat/skimmed milk consumption was significantly greater among individuals with higher levels of schooling and income, which is similar to data reported in the 2008–2009 Brazilian Family Budget Survey⁽³²⁾ and the study conducted by Muniz *et al.*⁽³¹⁾. A better socio-economic status provides greater access to information on healthy eating and the acquisition of differentiated products⁽³¹⁾.

The increase in low-fat/skimmed milk consumption with the increase in the number of chronic diseases may be the result of the contraindication of whole milk for individuals with CVD as well as the greater use of healthcare services by individuals with a greater number of diseases, which increases opportunities for receiving advice on health and diet⁽⁴⁶⁾. In the present study, 68·4 % of the individuals who drank low-fat milk reported having some type of CVD.

Another important finding of the present investigation and one that has been explored little is the fact that low-fat/skimmed milk consumption was not greater among individuals with excess weight. This type of milk was expected to be consumed more among individuals with overweight and obesity, as a balanced diet is a necessary component of weight control, along with low sugar and fat intake⁽⁴⁷⁾.

As mentioned in the introduction, recent studies^(17–22) have reported that there is no evidence that the saturated fat in milk⁽¹⁷⁾, intake of whole milk⁽¹⁸⁾ and intake of dairy products^(19–22) are risk factors for mortality and for CVD. In fact, some of them have shown that there is evidence of a low protective effect^(19–21). Considering the lack of evidence of fat milk as a risk factor for CVD, it is necessary to evaluate if the recommendations of low-fat/fat-free milk on the dietary guides could be inducing individuals, who prefer whole milk and want to follow the guides, to stop the intake of any kind of milk probably impairing their health.

The prevalence of lactase non-persistence in Brazil is estimated to be 57 % among whites and 80 % in the black population⁽¹⁵⁾. However, a large portion of the population of the city of Campinas consumes milk with lactose. Only 0·5 % of consumers drank lactose-free milk and 0·8 % drank

soya milk. It should be borne in mind that a lactose intolerant individual can ingest up to 12 g/d (equivalent to one 200-ml glass) of milk without experiencing any symptoms⁽⁴⁸⁾.

The present study has limitations that should be considered. The questions on food frequency enabled the evaluation of the frequency of consumption but not the amount consumed. In addition, the frequency of intake of other dairy products was not evaluated to ascertain whether even with low milk consumption people could achieve Ca recommendations by frequent intake of other dairy products. However, as mentioned earlier, the consumption of dairy products by the Brazilian population tends to be low⁽³²⁾. All answers were reported by the interviewees and are therefore subject to information bias. Moreover, the cross-sectional design impedes the establishment of causal relations. The importance of the current study resides in the topical nature of the subject and its objective, as milk consumption in adulthood is a controversial issue and there are few studies on the current pattern of milk consumption in different segments of the population.

Conclusion

Despite the high nutritional quality of milk and the different types available on the market aimed at meeting practically all the needs of individuals, an important portion of adults and older people in the population studied does not heed current recommendations regarding milk consumption⁽²⁵⁾. Less than half of the individuals consume milk five or more times per week and those with this practice had better diet quality and better self-rated health. Although recommended by dietary guidelines in Brazil and other countries, the consumption of low-fat/skimmed milk was low (18·4 %) and was strongly associated with socio-economic status, diet quality and the occurrence of morbidities. The results revealed no difference in the consumption of low-fat/skimmed milk between individuals with ideal weight and those with excess weight. The consumption of lactose-free milk was also low in the population studied. The results indicate the need for the population to be better informed about the nutritional qualities of milk and its health benefits, keeping in mind that there is perhaps evidence that the saturated fat in milk is a risk factor for CVD. Public policies should encourage the consumption of milk, considering its role in metabolism and in the prevention of diseases, such as osteoporosis.

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