Population and Economics

Population and Economics 8(1): 97–114
DOI 10.3897/popecon8.e115759

RESEARCH ARTICLE

Sociodemographic and behavioral factors of pre-obesity and obesity among adult Russians

Elena Churilova [1], Olga Rodina [1]

1 *HSE University, Moscow, 101000, Russia*

Received 14 November 2023 ♦ **Accepted** 5 February 2024 ♦ **Published** 29 March 2024

Citation: Churilova E, Rodina O (2024) Sociodemographic and behavioral factors of pre-obesity and obesity among adult Russians. Population and Economics 8(1):97-114. https://doi.org/10.3897/popecon.8.e115759

Abstract

Based on data from the 2021 Sample Population Health Survey, the paper assesses the prevalence and socio-demographic and behavioral risk factors of pre-obesity and obesity among the adult population of Russia. A standard approach for epidemiological studies was used: body weight was assessed using the Body Mass Index (BMI). The influence of risk factors was determined by logistic regressions. It was revealed that the average BMI value among men is 26.9 kg/m^2 and among women - 26.8 kg/m^2. At the age of 18 and over, 67.2% of men and 57.9% of women are overweight, and 19.5% of men and 24.9% of women are obese. The prevalence of overweight and obesity increases with age but decreases after age 75. There is a relationship between pre-obesity and eating habits of men and women: frequent consumption of foods high in salt, sausage and meat products, and sweets. Obesity in men is associated with the same factors as pre-obesity. Among women, the consumption of sweets and smoked meat products ceases to have a significant effect on the likelihood of obesity. A comparison of our results with the results of previous studies makes it possible to conclude that there is no significant change in the prevalence of overweight and obesity among Russians. A sustainable influence of behavioral and eating habits allows us to conclude that it is necessary to conduct a state awareness campaign about components of a healthy lifestyle and develop measures to increase commitment to physical education, sports, and healthy eating among the population.

Keywords

BMI, overweight, obesity, obesity prevalence, risk factors of non-communicable diseases, Sample Population Health Survey

JEL codes: I12, J10, J11

Introduction

Global estimates of overweight prevalence show that from the early 1980s to the mid-2010s the proportion of adult population with a BMI of 25 kg/m^2 and above increased from 28.8% to 36.9% among men and from 29.8% to 38.0% among women. At the same time, obesity is becoming increasingly common in all age groups, but the most active growth occurs at the age of 20-39 years (Ng et al. 2014). Researchers predict that obesity will reach its peak prevalence between 2030 and 2052 among men and between 2026 and 2054 among women (the highest levels are expected in the United States, where 44% of the population aged 20-84 is projected to be obese), and the age distribution will take an inverse U-shape with a peak at 60-69 years (Janssen et al. 2020).

According to WHO estimates, in European countries, 59% of adults live with overweight, of which 23% are obese (WHO 2022). Moreover, men are more likely to be overweight without becoming obese (63% versus 54%), while the prevalence of the latter is higher in women (22% versus 24%).

The prevalence of overweight and obesity is influenced by many factors: eating habits, level of physical activity, socioeconomic status, and genetic predisposition. Moreover, back in the early 2000s, the first two factors were considered responsible for up to 60% of deaths and almost half of the global burden of disease (WHO 2003). The WHO European Region is characterized by spatial inequalities in the prevalence of obesity (particularly high levels of overweight and obesity are observed in the Mediterranean and Eastern Europe), as well as social inequalities (for example, the prevalence of obesity is higher among people with lower levels of education) (WHO 2022).

The relationship between socioeconomic status and obesity is not limited to Europe. A study conducted in several U.S. states showed that such factors as poverty, unemployment, and low income lead to a higher risk of obesity (Akil & Ahmad 2011), and in Australia a relationship was found between higher BMI levels and poor housing conditions for men or other forms of employment compared to formal full-time employment for women (Ball et al. 2003). It is worth noting that among women, the inverse relationship between socioeconomic status and obesity is more stable than among men or children (Sobal & Stunkard 1989). Although some studies have raised the question of whether socioeconomic status determines obesity or the other way around, longitudinal studies suggest that socioeconomic status is primary in relation to weight gain and the risk of developing obesity (Ball & Crawford 2005).

In the Russian scientific literature, there are estimates of prevalence of overweight, obesity and factors associated with them, based on data from both all-Russian nationally representative studies and large epidemiological surveys. Thus, within the framework of the Russian Longitudinal Monitoring Survey (RLMS-HSE), the information about height and weight is self-reported. Trends in changes in the prevalence of overweight according to these data are presented in the works of Grigorieva (2012), Kolosnitsyna and Kulikova (2018). Subjective data on height and weight were also collected as part of the "Sample Observational Nutrition Study" (SONS), conducted by the Russian State Statistics Service (Rosstat) in 2013. As part of the same study in 2018, data on height and weight of the respondents were collected both by measurements and as stated by the respondents. Estimates of the prevalence of obesity according to the SONS-2018 data are presented in the article by Martinchik et al. (2021).

Among large epidemiological surveys collecting objective indicators of public health, one can highlight the "Monitoring of Arterial Hypertension" survey, several waves of which took

place from 2003 to 2010, as well as the study "Epidemiology of Cardiovascular Diseases and their Risk Factors in the Regions of the Russian Federation" (ESSE-RF), conducted in a number of regions in 2012 and 2017. Recent epidemiological studies include the "Know Your Heart" survey conducted in 2015–2018 in two large Russian cities - Arkhangelsk and Novosibirsk (Cook et al. 2018). However, most of the ongoing epidemiological studies and health screenings are local in nature, and their results are not representative of the entire Russian population. An overview of the studies on prevalence of obesity is given in (Alferova & Mustafina 2022).

According to research, the prevalence of obesity in Russia over the past 30 years has changed as follows: according to the results of a survey in 1993, the prevalence among men increased from 10.8% to 27.9% in 2017, among women - from 26. 4 to 31.8%, and this growth was observed both at the national and regional levels (Alferova & Mustafina 2022). BMI increased during this period in all age groups, but not at such an intensive rate as, for example, in the U.S. (Vilkov et al. 2018). Gender differences in the Russian population are observed within different age groups. Thus, it was shown that the proportion of obese women in almost all age groups is more than 2.5 times higher than the same indicator for men (Shalnova & Deev 2008), although in 2005-2012 the rate of prevalence of obesity in men was significantly higher (Martinchik et al. 2015). There is a direct relationship between age and prevalence of obesity: the proportion of obese men increases linearly from 14.3% at 25-34 years to 36.3% at 55-64 years, and the proportion of women - from 10.7% to 52.3% respectively (Balanova et al. 2018). Trends identified based on the results of national surveys are also observed at the regional or even municipal level, for example in Irkutsk (Menshikova & Babanskaya 2018) or the Vladimir region (Mamedov et al. 2023).

In Russia, socioeconomic factors are stronger determinants of obesity risks among women than men. Studies based on data from SONS-2018 and ESSE-RF showed that among women with higher education the incidence of obesity is significantly lower than in groups with elementary or secondary education, while for men the difference between these groups was insignificant (Martinchik et al. 2021; Balanova et al. 2018). However, the SONS-2018 results allow us to conclude that the average BMI of men directly depends on the average per capita household income, while for women, BMI, on the contrary, decreases only in the fifth income quintile (Martinchik et al. 2021). There is also a territorial gradient in the prevalence of obesity: its frequency is significantly higher in rural areas (especially for women), and the higher the population in an urban area, the lower the proportion of the population with obesity (Martinchik et al. 2021; Balanova et al. 2018).

Researchers note the importance of lifestyle as a factor of obesity. Excess weight is positively associated with alcohol consumption, and negatively associated with smoking and exercise. The influence of diet quality on weight problems has not been sufficiently studied on the Russian data. Kolosnitsyna and Kulikova (2018) found that the frequency of eating out is not a significant factor in overweight. Mikhaylova et al. (2018) note that the caloric intake of young obese men is higher than normal, and the bulk of food is often consumed in the evening. Another study (Viktorova et al. 2021) found that among obese people there is a simultaneous restriction of confectionery consumption and an increase in the frequency of adding salt to food.

Most of the research on the prevalence and factors of obesity in Russia has been based on data from epidemiological studies, in which the sample is based on the selection of patients from state polyclinics and is often limited to the population aged 25-64 years. The purpose of our study is to determine prevalence, as well as socio-economic and behavioral factors of

pre-obesity and obesity among the adult population of Russia, based on data from the population-representative Sample Population Health Survey (SPHS) 2021. The use of SPHS-2021 will both provide up-to-date estimates of prevalence of overweight and obesity among men and women in Russia, and comparisons with data from earlier Russian surveys.

Data and Methods

The article presents an analysis of data from the 2021 Sample Population Health Survey[1], conducted by the Federal State Statistics Service (Rosstat) in all constituent entities of the Russian Federation and covering 60 thousand households. The data are representative of Russia as a whole. The unit of observation is private households and their members. The sample included 125,601 respondents, including children. Our study selected a subsample of 95,856 respondents aged 18 years or older for whom height and weight were known; 41.8% of them were men, 58.2% were women.

All respondents over 15 years of age were interviewed using the standard "Questionnaire for Adults" with 12 sections, including sections on general information about the respondent, health status, nutrition, physical education and sports, daily physical activity, and behavioral risk factors. In addition, the survey collected information on anthropometric measurements of men and non-pregnant women. The respondent was asked to either report their height and weight to the interviewer or have their weight and height measured. Body weight was measured by the interviewer using electronic floor scales with an accuracy of 0.1 kg. Height was measured by the interviewer using a stadiometer. The results are presented with an accuracy of 0.1 cm.

We used the Body Mass Index (BMI or Quetelet Index) to calculate indicators of overweight and obesity. BMI is the easiest to calculate and widely used indicator that allows you to assess how a person's body weight corresponds to his or her height; it is calculated as the ratio of the respondent's body weight in kilograms to the square of his or her height in meters. BMI was categorized in accordance with WHO standards: underweight with BMI<18.5 kg/m^2, normal body weight with BMI from 18.5 to 25 kg/m^2, pre-obesity - BMI from 25 to 30 kg/m^2, class I obesity - BMI from 30 to 35 kg/m^2, class II obesity - BMI from 35 to 40 kg/m^2, class III obesity - BMI 40 or more kg/m^2 (WHO 1997). According to WHO definitions, a diagnosis of "overweight" is made when a BMI is equal to or greater than 25 kg/m^2, while a diagnosis of "obesity" is made if a BMI is equal to or greater than 30 kg/m^2. The prevalence of overweight and obesity was analyzed separately for men and women in the following age groups: 18–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75 years and older. Using such age grouping in the analysis allows us to further compare our results with previous studies.

To analyze the influence of socio-demographic and behavioral factors on pre-obesity and obesity among the respondents, a logistic regression was used, which was chosen due to both the cross-sectional nature of the data and the fact that previous studies on the influence of socio-economic and other characteristics on obesity were done with logistic regression models. The models are built separately for men and women. The dependent variables were: a) presence/absence of pre-obesity (1 – BMI from 25 to 30; 0 – BMI less than 25), b) presence/absence of obesity (1 – BMI>=30; 0 – BMI less than 30).

1 A detailed description of the study is available on the website of the Federal State Statistics Service. URL: https://rosstat.gov.ru/free_doc/new_site/zdor21/PublishSite_2021/index.html

The following variables were included in the analysis of socio-demographic characteristics: age in complete years; age squared; level of education (1 – below secondary, 2 – secondary and secondary vocational, 3 – higher); type of settlement (1 – city; 2 – village); marital status (1 – never married, 2 – married or partnered, 3 – divorced/separated, 4 – widowed); share of family income spent on food (1 – 1/3 or less, 2 – about ½, 3 – 2/3 or more).

The following variables of the behavioral risk factors and nutrition quality were used in the analysis: smoking status (1 – currently smokes, 2 – quit smoking, 3 – never smoked); frequency of alcohol consumption over the past 12 months (1 – did not drink alcohol, 2 – once a week or less, 3 – 2 times a week or more often); marker of physical activity (1 – does engage in sports/exercise/active leisure, 0 – does not engage in sports/exercises/active leisure); marker of regular addition of salt to food, obtained based on the frequency of adding salt, salty seasonings or salty sauce to prepared food (1 – adds salt daily or often, 0 – adds salt sometimes/rarely/never); marker of regular consumption of high-salt foods, measured through the frequency of consumption of processed foods high in salt (1 – daily or often, 0 – sometimes/rarely/never); frequency of consumption of cooked sausages (1 – more than once a week, 0 – once a week or less); frequency of consumption of smoked meat products (1 – more than once a week, 0 – once a week or less); frequency of consumption of confectionery products and sweets (1 – more than once a week, 0 – once a week or less); marker of insufficient consumption of vegetables and fruits per day, obtained based on the respondent's subjective assessment of consumption of less than 400 grams of vegetables and fruits per day (1 – more than 400 grams of vegetables and fruits per day, 0 – less than 400 grams).

The main socio-demographic and behavioral characteristics of the respondents depending on BMI are presented in Table 1.

The methods of descriptive statistics were used in the work: relative frequencies, averages, and cross-tabulations. Crude prevalence rates and population means are standardized using the 2013 European Population Standard.

Table 1. Main socio-demographic and behavioral characteristics of the respondents depending on BMI

	Men				Women			
	Under-weight	Healthy weight	Pre-obesity	Obesity	Under-weight	Healthy weight	Pre-obesity	Obesity
Average age, years	40.4	44.2	49.6	54.1	34.6	44.7	55.8	60.4
Education, %:								
Below secondary	12.7	7.5	5.4	6.3	7.0	6.3	7.7	9.4
Secondary, secondary vocational	71.8	65.9	64.0	69.4	53.5	52.0	60.9	68.2
Higher	15.5	26.7	30.6	24.2	39.5	41.7	31.5	22.4
Marriage and partnership status, % :								
Never married	46.9	24.8	10.8	6.1	35.2	16.5	6.0	4.2
Married or partnered	40.8	60.1	73.3	79.0	43.8	51.1	50.4	47.6
Divorced or separated	6.9	9.7	9.7	8.5	14.0	17.7	16.9	13.9
Widowed	5.3	5.4	6.1	6.4	7.0	14.7	26.7	34.3

	Men				Women			
	Under-weight	Healthy weight	Pre-obesity	Obesity	Under-weight	Healthy weight	Pre-obesity	Obesity
Location, % :								
City	67.3	69.5	68.8	64.6	78.9	74.2	68.3	62.5
Village	32.7	30.5	31.2	35.4	21.1	25.8	31.7	37.5
Share of family income spent on food, %:								
1/3 or less	34.7	38.9	40.4	37.5	41.8	41.9	37.7	34.6
About half	37.9	41.2	41.3	43.4	38.6	40.1	42.2	42.8
2/3 or more	27.4	19.9	18.3	19.1	19.7	18.0	20.1	22.5
Smoking status, % :								
Currently smoking	50.4	40.7	37.6	36.1	16.3	11.4	8.7	7.7
Quit smoking	9.9	15.5	21.3	25.7	5.9	5.4	4.5	4.3
Never smoked	39.7	43.8	41.1	38.1	77.8	83.2	86.8	87.9
Frequency of alcohol consumption in the last 12 months, %:								
More than twice a week	19.3	14.5	12.3	12.6	6.0	3.4	2.6	2.0
Once a week or less	60.8	62.9	64.6	63.2	64.7	67.8	64.1	60.4
Did not drink	19.9	22.7	23.1	24.2	29.3	28.8	33.3	37.6
Frequency of adding salt to food,% :								
Daily or often	30.6	28.7	28.8	29.9	21.5	19.1	18.2	19.2
Sometimes or rarely	69.4	71.3	71.2	70.1	78.5	80.9	81.8	80.8
Frequency of consumption of foods high in salt, %:								
Daily or often	23.0	22.6	24.4	25.9	14.6	13.2	14.0	14.4
Rarely or sometimes or never	77.0	77.4	75.6	74.1	85.4	86.8	86.0	85.6
Sports, active leisure, exercise, %:								
Does not engage in sports/exercise/active leisure	76.0	70.4	75.2	82.8	65.7	71.6	83.2	88.9
Engages in sports/exercise/active leisure/	24.0	29.6	24.8	17.2	34.3	28.4	16.8	11.1
Frequency of consumption of cooked sausages and frankfurters, %:								
Once a week or less	40.6	37.1	35.1	33.2	49.3	48.4	48.2	48.8
More than once a week	59.4	62.9	64.9	66.8	50.7	51.6	51.8	51.2
Frequency of consumption of smoked meat products,%:								
Once a week or less	79.5	73.8	71.7	69.6	81.3	82.6	83.2	84.2
More than once a week	20.5	26.2	28.3	30.4	18.8	17.4	16.8	15.8
Frequency of consumption of confectionery products, sweets,%:								
Once a week or less	51.9	52.3	53.3	52.2	44.7	45.2	46.9	49.7
More than once a week	48.1	47.7	46.7	47.8	55.3	54.8	53.1	50.3
Consumption of vegetables and fruits daily at least 400 grams,%:								
No	88.2	89.3	89.2	88.9	86.5	87.7	88.3	88.5
Yes	11.8	10.7	10.8	11.1	13.5	12.3	11.7	11.5

Source: Authors' calculations based on data from the 2021 Sample Population Health Survey.

Limitations of the Study

The first limitation is related to the characteristics of the study sample. The SPHS is a survey of private households; thus, the study does not include persons living in collective households (for example, long-term residents in hospitals, boarding schools, monasteries, religious communities, prisons, and those living in other institutional facilities and collective residential premises). The health status, physical activity, and nutritional status of the institutional population may differ from those living in private households.

A further limitation is that in this study, the prevalence of obesity was assessed according to WHO criteria for BMI. However, the BMI indicator has a number of disadvantages, including the possibility of being falsely high in the case of increased muscle mass. Currently, in epidemiological studies, in addition to BMI, the prevalence of abdominal obesity is also assessed by waist circumference, as well as waist-to-hip ratio.

The third limitation is due to the fact that during the survey, for some respondents, weight and height were not measured but were self-reported. Height measurements were taken for 71.8% of men and 78.6% of women surveyed. Weight measurements were taken for 74.5% of men and 81.1% of women surveyed. In the case of self-reported height and weight, accidental or deliberate distortions of their values are possible, both downward and upward.

The fourth limitation is that we use a subjective assessment of the frequency of consumption of certain products by the respondents. A question about the frequency of consumption of certain products may encourage the respondent to give the desired answers, that is, to underestimate the frequency of consumption of harmful, unhealthy foods and increase the frequency of consumption of healthy foods, especially if the respondent is aware of the principles of proper, healthy nutrition. A similar point can be made about commitment to sports, exercise, and active leisure. In addition, the analysis used a subjective assessment the financial situation. We used the variable of subjective assessment of the share of family income spent on food as an indicator of living standards. Other studies usually use a subjective assessment of the financial situation (whether there is enough money for food, clothing, large household appliances), however, the SPHS-2021 uses a scale that differs from the scale used in other studies.

Finally, as one of the markers, we use a norm equal to the consumption of 400 grams of vegetables and fruits per day. The questionnaire asks the respondent to indicate the number of servings of fruits/berries/vegetables (except for potatoes, sweet potatoes) consumed per day. The definition of a serving is only for fruit and means "a whole apple, banana, orange, or any other fruit in an amount of 80 grams." However, the explanation given to the respondent, in our opinion, is not very informative, since it refers to medium-sized fruits. We can assume that the prevalence of daily consumption of vegetables and fruits per day may ultimately be underestimated.

Results

The average BMI in the sample is 26.9 kg/m^2 for men and 26.8 kg/m^2 for women. A gradient increase in average BMI values with age is observed in women from 18 to 74 years old: from 22.1 kg/m^2 in 18-24 years to 29.8 kg/m^2 in 65-74 years (Table 2). In women over 75 years of age, BMI decreases to an average of 28.5 kg/m^2. The main increase in the average

BMI in men occurs from 18 to 54 years old - from 24.0 kg/m² to 27.7 kg/m². In the youngest age group considered, BMI is higher in men. By the age of 45-54, gender differences in the height-to-weight ratio disappear, and starting at 55-64 years, the BMI of women significantly exceeds the BMI of men.

Table 2. BMI values for men and women in different age groups

Age group	Men		Women	
	kg/m²	standard error of the mean	kg/m²	standard error of the mean
18-24	24.0	0.06	22.1	0.07
25-34	25.9	0.04	23.8	0.05
35-44	26.9	0.04	25.7	0.05
45-54	27.7	0.05	27.5	0.05
55-64	27.9	0.05	29.4	0.05
65-74	28.1	0.06	29.8	0.05
75+	27.2	0.08	28.5	0.07
All ages	26.9	0.02	26.8	0.02

Source: Authors' calculations based on data from the 2021 Sample Population Health Survey.

According to the data analysis, in 2021, 67.2% of men and 57.9% of women aged 18 years and older were overweight. The prevalence of overweight varies by age. Among women, the minimum prevalence of overweight is observed at the age of 18-24 years - 15.8%, then it continuously grows, reaching a maximum of 83.1% in the age group of 65-74 years, and among women over 75 years of age the percentage of overweight women shrinks by almost 10 percentage points. In men, a similar pattern is observed: the lowest number of overweight men is among males aged 18-24, then the prevalence of overweight increases until the age of 45 years. In the age groups 45-54, 55-64 and 65-74 years, the same proportion of men are overweight – 76%. After age 75, the prevalence of overweight declines in men, as it does in women. However, among men aged 18 to 44 years, the prevalence of overweight is 1.4-2.1 times (depending on age group) higher than that for women (Figure 1).

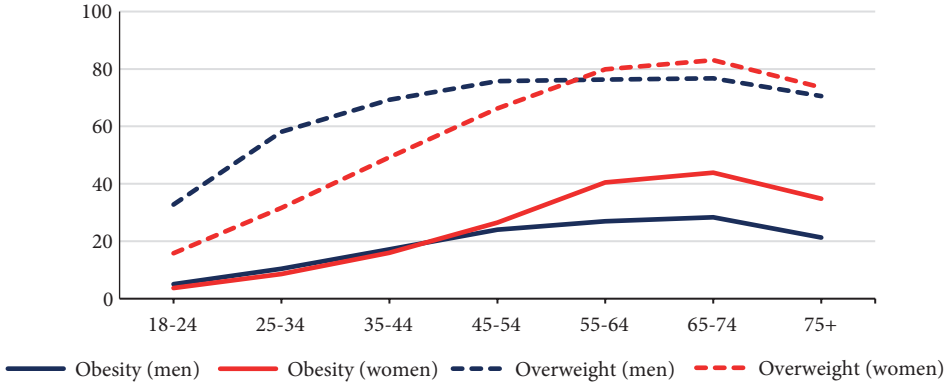

Figure 1. Prevalence of overweight and obesity among men and women of different age groups, %.
Source: Authors' calculations based on data from the 2021 Sample Population Health Survey.

Obesity affects 19.5% of men and 24.9% of women over 18 years of age. The prevalence of obesity is minimal at young ages and increases from one age group to another until the age of 65-74 years. Gender differences in the prevalence of obesity begin to be clearly visible in the age group 55-64 years: at these ages, obesity is observed in 27% of men and 40.5% of women. At subsequent ages, gender differences persist.

Men are characterized by the predominance of pre-obesity in all age groups (Figure 2). Almost half of the male population in all age groups except for those aged 18-24 years is pre-obese overweight. In women, pre-obesity prevails only up to 54 years of age. Although the most common form of obesity in both men and women is class I obesity, the proportion of women with class II and II in all age groups is 1.5-2 times higher than the proportion of men.

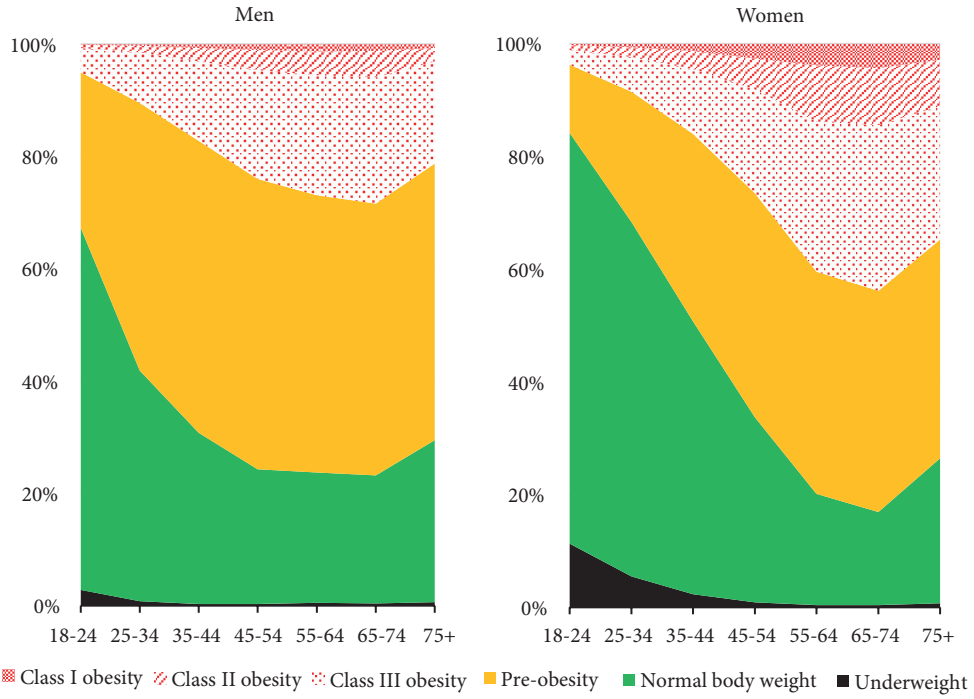

Figure 2. Prevalence of BMI values among men and women of different age groups, %. *Source:* Authors' calculations based on data from the 2021 Sample Population Health Survey.

To analyze the influence of individual socioeconomic and behavioral factors on pre-obesity and obesity, we built logistic regression models separately for men and women (Table 3).

The presence of pre-obesity among men is associated with marital status: those who are married or partnered, divorced, or widowed are more likely to be pre-obesity compared to single men. Men who do not have higher education and live in the city are significantly less likely to be pre-obesity.

Among the behavioral characteristics associated with pre-obesity in men, smoking in the past or absence of such habit, as well as rare alcohol consumption, have an influence. With eating habits, excess body weight is strongly influenced by frequent consumption of foods high in salt, cooked and smoked meat products, and sweets.

Among women, pre-obesity is associated in the same way as with men, with marital status. However, the probability of having pre-obesity is higher among women who are married or partnered and widowed, while among women who are divorced, it is the same as among women who have never been married or partnered. Women with secondary and secondary vocational education are more at risk of having pre-obesity compared to women with higher education. In addition, pre-obesity women spend their income on food.

Among behavioral factors, smoking status has a strong influence on overweight among women. The probability of having weight problems among women who quit smoking and who never smoked is 1.4 and 1.26 times higher, respectively. The probability of being pre-obese is higher among the respondents of both sexes who consume alcohol less than once a week. Sports and exercise, on the contrary, reduce the probability of women being pre-obese.

Just like with men, the presence of pre-obesity in women is associated with the consumption of foods high in salt, frequent consumption of cooked and smoked meat products, and frequent consumption of sweets. Frequently adding salt to food, on the contrary, slightly reduces the probability of adult Russians being pre-obese. Consumption of less than 400 grams of vegetables and fruits per day is not a factor of pre-obese.

Table 3. Factors associated with pre-obese and obesity among men and women, odds ratio

Factor	Pre-obese (BMI from 25 to 30 kg/m^2)		Obesity (BMI from 30 kg/m^2)	
	Men	Women	Men	Women
Age	1.111 ***	1.165 ***	1.123 ***	1.204 ***
Age squared	0.999 ***	0.999 ***	0.999 ***	0.999 ***
Marital status: Never been married or partnered – ref.				
Married or Partnered	1.636 ***	1.153 ***	1.533***	1.125 *
Divorced/separated	1.362 ***	1.045	1.136	0.943
Widowed	1.623 ***	1.179 **	1.132	1.192 ***
Education: Higher – ref.				
Secondary education, secondary vocational education	0.898 ***	1.320 ***	1.095**	1.438 ***
Below secondary education	0.702 ***	1.028	1.053	1.308 ***
Living in rural areas	1.009	1.160 ***	1.128***	1.316 ***
Share of family income spent on food: 1/3 or less – ref.				
About ½	0.951	1.083 ***	1.059*	1.120 ***
2/3 or more	0.863 ***	1.078 **	0.952	1.157 ***
Smoking: Currently smoking – ref.				
Quit smoking	1.378 ***	1.128 *	1.369***	1.072
Never smoked	1.258 ***	1.138 ***	1.215***	0.992
Alcohol consumption: Never in the last 12 months – ref.				
Once a week or less	1.120 ***	1.151 ***	1.119***	1.080 ***

Factor	Pre-obese (BMI from 25 to 30 kg/m²)		Obesity (BMI from 30 kg/m²)	
	Men	Women	Men	Women
More than 2 times a week	0.952	0.942	1.092	0.857 *
Engagement in sports, exercise, active leisure	0.995	0.737***	0.759***	0.608 ***
Frequently adding salt to food	0.940 *	0.924 **	0.985	1.109 ***
Frequent consumption of foods high in salt	1.227 ***	1.163 ***	1.189 ***	1.158 ***
Consumption of cooked meat products more than once a week	1.152 ***	1.121 ***	1.119***	1.114 ***
Consumption of smoked meat products more than once a week	1.123 ***	1.086 **	1.220 ***	1.037
Consumption of sweets more than once a week	1.083 ***	1.086 ***	1.130***	1.001
Consumption of fruits and vegetables, more than 400 grams per day	0.961	1.046	1.043	0.999
Constant	0.052***	0.005***	0.004***	0.001***
Number of included observations	23525	26157	29851	36722
Percentage correctly predicted	64.7	65.8	78.8	71.2

Note: * – p<0.1, ** – p<0.05, *** – p<0.01

Source: Authors' calculations based on data from the 2021 Sample Population Health Survey.

As for obesity, the influence of most factors that have been associated with pre-obesity is only increasing. A predictor of obesity in both men and women is the secondary and secondary vocational education. Education below secondary is not a factor of obesity among men, but is a risk factor among women. The probability of obesity for men and women living in rural areas is 1.1 and 1.3 times higher compared to those living in cities. Men and women who spend about half of their total income on food are slightly more likely to be obese. However, spending more than 2/3 of your income on food increases the probability of obesity only for women.

Men who have never smoked and quit smoking are more likely to be obese than men who smoke. For women, there is no significant effect of smoking on the probability of being obese. Men and women who drink alcohol once a week or less have a greater risk of obesity compared to non-drinkers. At the same time, the effect of more frequent alcohol consumption was not identified.

The role of regular sports and physical exercise is changing: for men, such training or active recreation have become factors that reduce the likelihood of obesity. Frequently adding salt to food has no effect on obesity among men and is positively associated with obesity among women. In women, there is only an effect of frequent consumption of cooked meat products on the probability of being obese, while in men, there is an association between consumption of both cooked and smoked meat products, as well as sweets, and both overweight and obesity. Finally, consuming the required minimum of fruits and vegetables per day does not affect the likelihood of obesity.

Discussion

In this work, we have analyzed the prevalence of overweight and obesity in Russia according to the 2021 Sample Population Health Survey. This study is representative of the entire population of Russia, unlike epidemiological studies, where the sample is formed on the basis of medical institutions with results usually assessing the prevalence of various risk factors. The advantage of SPHS compared to another study representative of the entire population of Russia - RLMS-HSE - is the availability of height and weight measurements for more than 3/4 of the respondents, increasing the objectivity of the data obtained.

Our analysis showed that in 2021, 67% of adult men and 58% of women in Russia were overweight. Our estimates of the overweight prevalence are slightly higher than the estimates of the average prevalence of overweight in the world, in the European Region and in Russia, presented by WHO (WHO 2021b, 2022). According to the results of our study, the prevalence of obesity was 19.5% among men and 22.8% among women. WHO, based on the 2016 data, determines the prevalence of obesity in Russia at 18.1% and 26.9% for men and women, respectively (WHO 2022). According to estimates made on data from the Sample Observational Nutrition Study in 2018 and presented in (Martinchik et al. 2021), 66.1% of men and 63.0% of women are overweight, including obesity at 19 years and older among 18.8% of men and 27.4% of women. According to estimates based on RLMS data, the proportion of Russians who were overweight in 2016 was 62%, the proportion of obese Russians was 26.8% (Kolosnitsyna & Kulikova 2018). Thus, our estimates of the prevalence of overweight and obesity are quite close to WHO estimates and estimates based on the Sample Observational Nutrition Study by Rosstat. However, they are lower than those previously obtained by researchers based on RLMS data; this may be due to the fact that in RLMS information about height and weight is self-reported by the respondents, while in SONS-2018 and in the SPHS-2021, most of this information is the measurements at the time of the survey.

According to the ESSE-RF epidemiological survey, the prevalence of obesity by BMI in 2012-2014 was 26.9% for men and 30.8% for women aged 25-64 years (Balanova et al. 2018). A similar calculation undertaken by the authors of this article shows a prevalence of obesity of 19.7% for men and 22.8% for women in the same age group. It should be taken into account that ESSE-RF was conducted in 13 regions of Russia and represents the population of only these regions, with the sample formed on the basis of medical institutions. Thus, due to the difference in research methodology, only a very cautious conclusion can be drawn about a decrease in the prevalence of obesity among Russians aged 25-64.

We have also compared our results with the obesity prevalence data from the "Know Your Heart" study, conducted from 2017 to 2019 in two Russian cities: Arkhangelsk and Novosibirsk. According to this study, the age-standardized prevalence of obesity by BMI is 25.7% among men and 36.7% among women aged 40–69 years (Kholmatova et al. 2022). Our calculation of the age-standardized prevalence of obesity in the same broad age group according to the 2021 Sample Population Health Survey gave similar estimates: 26.2% among men and 36.1% among women.

As for the risk factors associated with obesity, we have expectedly established a positive relationship with age, which was also found in other studies (Shalnova & Deev 2008; Shalnova et al. 2017; Balanova et al. 2018; Martinchik et al. 2021; Kholmatova et al. 2022). The identified relationship between living in a city and a lower prevalence of obesity was also noted in earlier studies (Balanova et al. 2018; Martinchik et al. 2021). The association of obesity with

education below secondary, secondary, and secondary vocational was previously confirmed for Russian women only (Balanova et al. 2018). Our conclusion that married or partnered men and women are more likely to be obese is consistent with the findings of (Kholmatova et al. 2022). However, as a reference group, in contrast to the mentioned work, we take only those who have never been married/partnered.

Earlier in the work (Kholmatova et al. 2022) it was shown that in large cities the risk of obesity increases as material security decreases only among women. We used the share of family income spent on food as an indicator of material security. Our analysis showed that the higher the share of family income spent it, the more likely women are to be obese. Spending half or more of the family income on food also increases a woman's probability of being pre-obese. At the same time, for men, the probability of being pre-obese is lower for those who spend almost all their money on food.

Considering behavioral risk factors, our results once again confirmed a conclusion made by other research (Balanova et al. 2018; Kholmatova et al. 2022) that men who quit smoking and who have never smoked have a significantly higher probability of being obese than men who smoke. However, the data we used failed to identify any effect of smoking on the probability of being obese among women. Our results may have been influenced by the survey methodology: during face-to-face interviews, some obese women may have concealed current or past smoking and generally given more socially approved responses regarding their behavior. Note that foreign reviews of studies on the relationship between smoking and the risk of obesity show that the hypothesis that smokers have a lower risk of obesity than quitters or non-smokers is not always confirmed (Chiolero et al. 2008). In addition, foreign studies indicate that the risk of obesity depends not only on smoking status, but also on the number of cigarettes smoked for smokers and the time since quitting smoking for quitters (Dare et al. 2015).

In general, in the Russian population, there is both a three-fold gap in the prevalence of smoking between men and women, and a steady trend towards decreasing the prevalence of smoking among men. The prevalence of smoking among women is low and has generally been more or less stable in the last decade, while it decreases at ages up to 45 years and increases at ages after 45 years (Kalabikhina & Kuznetsova 2019; Shkolnikov et al. 2020). Smoking is more common among Russian women with low education. Therefore, it can be assumed that smoking ceases to play a role in reducing the risk of obesity in conditions where the majority of the population has low physical activity and does not adhere to the standards of a balanced and healthy diet (see discussion below).

Previously, epidemiological studies have repeatedly shown the direct effect of excessive alcohol consumption on the probability of obesity in men and women (Balanova et al. 2018; Kholmatova et al. 2022). Our results were different: drinking alcohol once a week or less often leads to pre-obesity and obesity. The epidemiological studies in which this conclusion was made cover the working-age population, but we included the elderly in the analysis. Therefore, our first assumption was that our result could be due to the selection effect: alcohol abusers either do not live to old age or quit drinking altogether. We have tested the relationship separately for the respondents under and over 65 years of age: our results remained unchanged. Therefore, we believe that this result may be due to the following: first, in mass public opinion polls, people tend to underestimate the frequency of alcohol consumption (Zubkova et al. 2021). Second, as a rule, sample surveys poorly record the consumption of surrogates for alcohol and alcohol-containing liquids, however, the group of heavy drinkers and harmful alcohol users is rarely included in the sampling. But researchers note both

a decrease in the physical availability of non-drinking alcohol and illegal alcoholic beverages (Gil et al. 2021), and in general, a decrease in the volume of alcohol consumed in the population (Neufeld et al. 2020). In addition, despite all imperfections in the sample studies in terms of the entire volume and variety of alcoholic beverages consumed, researchers still talk about a change in the structure of alcohol consumed: a shift away from the "northern" model of consumption of predominantly strong alcohol (Radaev 2022).

We have founded that factors associated with both pre-obesity and obesity in both sexes included eating habits such as frequent consumption of foods high in salt and frequent consumption of cooked meats. Frequent consumption of smoked meat products is associated with pre-obesity and obesity only among men. Frequent consumption of sweets is associated with pre-obesity in both sexes and obesity only among men.

Our finding that frequently adding salt to food slightly reduces the probability of being pre-obesity for both sexes seems counterintuitive at first glance. Perhaps this result is explained by the fact that those who are accustomed to cooking without adding salt, prefer to add salt afterwards to taste. We have founded that not consuming enough fruits and vegetables per day is not a factor of pre-obesity and obesity in both sexes. Perhaps the lack of effect is either a consequence of imperfect wording of the question (see section Limitations of the study), or a consequence of the fact that the dietary structure of Russians does not comply with WHO recommendations in general, regardless of the presence or absence of weight problems (Karamnova et al. 2018; Viktorova et al. 2021), as well as the recommendations of the Russian Ministry of Health (Rodionova & Kopnova 2017), and adherence to a healthy diet has yet to a become an everyday practice (Pokida & Zybunovskaya 2022).

Participation in sports, exercise, or regular active leisure is a factor in reducing the risk of pre-obesity among women and obesity in both sexes. A number of studies have previously demonstrated that insufficient physical activity is observed in the majority of those who are overweight or obese (Belyakova et al. 2021) and exercising less than 3 hours a week almost doubles the risk of metabolically unhealthy obesity, characterized by the simultaneous presence of high blood pressure, diabetes, and abdominal obesity in the patient (Vinter et al. 2022). It is important to note that although SPHS-2021 used questions from the Global Physical Activity Questionnaire (WHO 2021a) to measure physical activity, we deliberately used only the physical activity measurement associated with playing sports, doing physical exercise and having active leisure in order to evaluate their contribution.

Conclusion

Our study shows that according to the comparisons with earlier WHO estimates and with the SONS-2018 results, the prevalence of overweight and obesity among the adult population of Russia has not changed significantly over the past few years. Pre-obesity and obesity remain associated with the socioeconomic status of the respondent and their behavioral habits, including eating. However, SPHS – the study, used in this paper, is a one-time cross-sectional study and does not allow us to assess the risks of pre-obesity and obesity in the respondents with a particular set of sociodemographic characteristics and different eating habits, as well as to track changes in health behavior patterns over time. Considering the scale of prevalence of overweight among Russians, we want a regular, representative study of the entire population appear in Russia with a panel component and collection of a wide range of both subjective and objective indicators of health

The SPHS data collection is carried out on the basis of personal surveys of household members by interviewers, which, in our opinion, leads to distortions in the respondents' answers to questions about the frequency of alcohol consumption. In addition, we believe that the frequency of consumption of foods high in salt, sausages and meat products and sweets may also be underestimated due to the interviewer effect. It is likely that collecting information by filling out food diaries or indicating an approximate daily diet would provide a more objective picture of eating behavior.

The persistent influence of behavioral and eating habits allows us to make a recommendation about the need for increased attention from the state and medical community to the problem of excess weight. The association of excess weight with frequent consumption of foods high in salt, cooked and smoked meat products, and sweets is alarming. This indicates not only the unhealthy eating habits of Russians, but also the need to conduct public awareness education and the need to consider the feasibility of introducing additional taxes on food products high in salt and sugar.

The analysis shows that sports and physical exercise reduce the likelihood of pre-obesity and obesity in women. It is necessary to develop and implement measures aimed at increasing commitment of the population, especially men, to physical education and sports.

In conclusion, we note that changing lifestyle and eating habits from unhealthy to healthy ones is an extremely challenging task that requires efforts from the state and the healthcare system, and even greater efforts from the part of the population leading a completely or partially unhealthy lifestyle. Therefore, success in reducing the prevalence of overweight in the entire population of Russia will be more likely to be determined by the motivation of adults and their willingness to change their lifestyle. However, educational activities among children and adolescents about proper nutrition and health care at school and in the media, their involvement in physical education and sports, may help reduce the prevalence of as well as overweight in population in the future.

Funding

The paper was prepared in the framework of a research grant funded by the Ministry of Science and Higher Education of the Russian Federation (grant ID: 075-15-2022-325).

List of references

Akil L, Ahmad HA (2011) Effects of socioeconomic factors on obesity rates in four southern states and Colorado. Ethnicity & Disease 21(1): 58–62. URL: https://www.jstor.org/stable/48717856

Alferova VI, Mustafina SV (2022) The prevalence of obesity in the adult population of the Russian Federation (literature review). Obesity and Metabolism 19(1): 96–105. https://doi.org/10.14341/omet12809 (in Russian)

Balanova YuA, Shalnova SA, Deev AD, Imaeva AE, Kontsevaya AV, Muromtseva GA, Kapustina AV, Evstifeeva SE, Drapkina OM (2018) Obesity in Russian population – prevalence and association with the non-communicable diseases risk factors. Russian Journal of Cardiology (6): 123–30. https://doi.org/10.15829/1560-4071-2018-6-123 -130 (in Russian)

Ball K, Crawford D (2005) Socioeconomic status and weight change in adults: A review. Social Science & Medicine 60(9): 1987–2010. URL: https://ideas.repec.org/a/eee/socmed/v60y2005i9p1987-2010.html

Ball K, Mishra GD, Crawford D (2003) Social factors and obesity: an investigation of the role of health behaviors. International Journal of Obesity (27): 394–403. https://doi.org/10.1038/sj.ijo.0802237

Belyakova NA, Kirilenko NP, Koroleva OM, Lyasnikova MB, Tsvetkova IG, Milaya NO, Solovyova AV, Krasnenkov VL (2021) Metabolic characteristics, nutritional status and behavior factors in people with obesity, working at industrial plant. Problems of Nutrition 90(1): 40–8. https://doi.org/10.33029/0042-8833-2021-90-1-40-48 (in Russian)

Chiolero A, Faeh D, Paccaud F, Cornuz J (2008) Consequences of smoking for body weight, body fat distribution, and insulin resistance. The American Journal of Clinical Nutrition 87(4): 801–9. https://doi.org/10.1093/ajcn/87.4.801

Cook S, Malyutina S, Kudryavtsev A et al. (2018) Know Your Heart: Rationale, design and conduct of a cross-sectional study of cardiovascular structure, function and risk factors in 4500 men and women aged 35-69 years from two Russian cities, 2015-18. Wellcome Open Research 3: 67. https://doi.org/10.12688/wellcomeopenres.14619.3

Dare S, Mackay DF, Pell JP (2015) Relationship between smoking and obesity: a cross-sectional study of 499,504 middle-aged adults in the UK general population. PLoS One 10(4): e0123579. https://doi.org/10.1371/journal.pone.0123579

Gil A, Savchuk S, Appolonova S, Allenov A, Khalfin R (2021) Availability of non-beverage alcohols in Russia in 2015-2020: Were control policies implemented since 2005 effective? Journal of Law, Public Policies, and Human Sciences 2(2): 8–34. https://doi.org/10.52571/jlpphs.v02.n02.pgi.08.2021

Janssen F, Bardoutsos A, Vidra N (2020) Obesity prevalence in the long-term future in 18 European countries and in the USA. Obesity Facts 13(5): 514–27. https://doi.org/10.1159/000511023

Kalabikhina IE, Kuznetsova PO (2019) Gender aspects of tobacco epidemic in Russia. Journal of the New Economic Association 4(4): 143–62. https://doi.org/10.31737/2221-2264-2019-44-4-5 (in Russian)

Karamnova NS, Shalnova SA, Deev AD, Tarasov VI, Balanova YuA, Imaeva AE, Muromtseva GA, Kapustina AV, Evstifeeva SE, Drapkina OM (2018) Nutrition characteristics of adult inhabitants by ESSE-RF study. Cardiovascular Therapy and Prevention 17(4): 61–6. https://doi.org/10.15829/1728-8800-2018-4-61-66 (in Russian)

Kholmatova K, Krettek A, Leon DA, Malyutina S, Cook S, Hopstock LA, Løvsletten O, Kudryavtsev AV (2022) Obesity prevalence and associated socio-demographic characteristics and health behaviors in Russia and Norway. International Journal of Environmental Research and Public Health 19(15): 9428. https://doi.org/10.3390/ijerph19159428

Kolosnitsyna MG, Kulikova OA (2018) Overweight: socioeconomic factors and consequences. Demographic Review 5(4): 92–124. https://doi.org/10.17323/demreview.v5i4.8664 (in Russian)

Mamedov MN, Sushkova LT, Isakov RV, Kutsenko VA, Drapkina OM (2023) Identification of sex characteristics of obesity and hypertension in the adult population of the Vladimir region. Russian Journal of Cardiology 28(4): 5425. https://doi.org/10.15829/1560-4071-2023-5425 (in Russian)

Martinchik AN, Baturin AK, Keshabyants EE, Peskova EV (2015) Gender and age characteristics and the trends in prevalence of obesity in the adult population in Russia during the 1994-2012 period. Problems of Nutrition 84(3): 50–7. URL: https://www.voprosy-pitaniya.ru/ru/jarticles_diet/358.html?SSr=180134d75d18ffffffff27c__07e8021512122e-c27 (in Russian)

Martinchik AN, Laikam KE, Kozyreva NA, Keshabyants EE, Mikhaylov NA, Baturin AK, Smirnova EA (2021) The prevalence of obesity in various socio-demographic groups of the population of Russia. Problems of Nutrition 90(3): 67–76. https://doi.org/10.33029/0042-8833-2021-90-3-67-76 (in Russian)

Menshikova LV, Babanskaya EB (2018) Age and sex epidemiology of obesity. Obesity and Metabolism 15(2): 17–22. https://doi.org/10.14341/omet8782 (in Russian)

Mikhaylova NI, Pinkhasov BB, Sorokin MYu, Selyatitskaya VG (2023) Eating behavior features and preferred diets in underweight and obese young men // Obesity and metabolism 20(2): 131–9. https://doi.org/10.14341/omet12955 (in Russian)

Neufeld M, Bunova A, Gornyi B, Ferreira-Borges C, Gerber A, Khaltourina D, Yurasova E, Rehm J (2020) Russia's national concept to reduce alcohol and abuse alcohol-dependence in the population 2010-2020: Which policy targets have been achieved? International Journal of Environmental Research and Public Health 17(21): 8270. https://doi.org/10.3390/ijerph17218270

Ng M, Fleming T, Robinson M et al. (2014) Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 384(9945): 766–81. https://doi.org/10.1016/S0140-6736(14)60460-8

Pokida AN, Zybunovskaya NV (2022) Food culture of the Russian population: Results of a sociological survey. Public Health and Life Environment – PH&LE (2): 13–22. https://doi.org/10.35627/2219-5238/2022-30-2 -13-22 (in Russian)

Radaev VV (2022) Alcohol cycles: Trends in the alcohol consumption in the Soviet and post-Soviet Russia, 1980-2010. Monitoring of Public Opinion: Economic and Social Changes Journal (3): 327–51. https://doi.org/10.14515/monitoring.2022.3.2180 (in Russian)

Rodionova LA, Kopnova ED (2017) Statistical analysis of characteristics of balanced nutrition of population in Russia. Voprosy Statistiki (7): 28–40. URL: https://voprstat.elpub.ru/jour/article/view/536 (in Russian)

Shalnova SA, Deev AD (2008) Body mass in men and women: the Russian national representative sample data. Cardiovascular Therapy and Prevention 7(6): 60–3. URL: https://cardiovascular.elpub.ru/jour/article/view/1635 (in Russian)

Shalnova SA, Deev AD, Balanova YuA, Kapustina AV, Imaeva AE, Muromtseva GA, Kiseleva NV, Boytsov SA (2017) Twenty years trends of obesity and arterial hypertension and their association in Russia. Cardiovascular Therapy and Prevention 16(4): 4–10. https://doi.org/10.15829/1728-8800-2017-4-4-10 (in Russian)

Shkolnikov VM, Churilova E, Jdanov DA et al. (2020) Time trends in smoking in Russia in the light of recent tobacco control measures: synthesis of evidence from multiple sources. BMC Public Health 20: 378. https://doi.org/10.1186/s12889-020-08464-4

Sobal J, Stunkard AJ (1989) Socioeconomic status and obesity: A review of the literature. Psychological Bulletin 105(2): 260–75. URL: https://doi.org/10.1037/0033-2909.105.2.260

Viktorova IA, Moiseeva MV, Stasenko VL, Shirlina NG (2021) Eating habits in overweight and obese people in the gender aspect according to the epidemiological study ESSE-RF2. Russian Medical Inquiry 5(6): 358–65. https://doi.org/10.32364/2587-6821-2021-5-6-358-365 (in Russian)

Vilkov VG, Shalnova SA, Deev AD, Balanova YuA, Evstifeeva SE, Imaeva AE, Kapustina AV, Muromtseva GA, Kiseleva NV (2018) Obesity trends in populations of the Russian Federation and the United States of America. Thirty-year long dynamics. Cardiovascular therapy and prevention 17(4): 67–73. https://doi.org/10.15829/1728-8800-2018-4-67-73 (in Russian)

Vinter DA, Mustafina SV, Rymar OD, Avdeeva EM, Shcherbakova LV, Malyutina SK (2022) Behavioral and social risk factors for metabolically unhealthy obesity: data from a 12-year prospective study in the Russian population. Russian Journal of Cardiology 27(5): 4997. https://doi.org/10.15829/1560-4071-2022 -4997 (in Russian)

Zubkova TS, Zamiatnina ES, Khalturina DA (2021) The system of indicators of behavioral risk factors in Russia at the national and regional levels. Public health 1(4): 56–67. https://doi.org/10.21045/2782-1676-2021-1-4-56-67 (in Russian)

Other sources of information

Grigorieva M (2012) Russians on the scales. Demoscope Weekly (529-530). URL: https://www.demoscope.ru/weekly/2012/0529/tema01.php (in Russian, accessed 06.01.2023)

WHO (1997) Obesity: Preventing and Managing the Global Epidemic of Obesity: Report of the WHO Consultation of Obesity; World Health Organization: Geneva, Switzerland. URL: https://books.google.ru/books?id=AvnqOsqv9doC&printsec=frontcover&hl=ru#v=onepage&q&f=false (accessed 06.01.2024)

WHO (2003) World health report 2003: shaping the future. URL: https://iris.who.int/bitstream/handle/10665/42789/9241562439.pdf (accessed 01.11.2023)

WHO (2021a) Global Physical Activity Questionnaire (GPAQ). URL: https://www.who.int/docs/default-source/ncds/ncd-surveillance/gpaq-analysis-guide.pdf (accessed 01.11.2023)

WHO (2021b) Obesity and Overweight. URL: https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight (accessed 01.11.2023)

WHO (2022) WHO European Regional Obesity Report 2022. URL: https://iris.who.int/handle/10665/353747 (accessed 01.11.2023)

Information about authors

- Elena Churilova – Candidate of Science in Sociology, Senior Research Fellow, International Laboratory for Population and Health, HSE University, Moscow, 101000, Russia. Email: evchurilova@hse.ru
- Olga Rodina – Master in Sociology, Research Assistant, International Laboratory for Population and Health, HSE University, Moscow, 101000, Russia. Email: oarodina@hse.ru