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Medical and sociological analysis of health status and quality of life of persons aged 60 and older in the Grodno Region

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ABSTRACT

BACKGROUND: Understanding the relationship between self-assessment of health status and quality of life, and social and demographic factors and population health indicators is essential to identify risk groups and provide rationale for the healthcare development in the region.

AIM: To substantiate the relationship between self-assessment of quality of life and satisfaction with health status, and social and demographic factors and actual health indicators for residents of the Grodno Region aged 60 and older.

METHODS: We analyzed the demographics and healthcare statistics, a database of 1,270 individuals aged 60 and older representative of the Grodno Region of the Republic of Belarus by sex, place of residence, and age. A short quality of life questionnaire issued by the World Health Organization was used, and nonparametric statistical methods were applied.

RESULTS: Life expectancy in the Grodno Region is close to the national average, with men in rural areas showing the lowest values across all regions. Heart diseases are by far the leading cause of death. In self-assessment of the quality of life, the predominant options selected by the respondents are "Good" or "Neither bad nor good," while in self-assessment of the health status satisfaction, the predominant options selected by the respondents are "Neither satisfied nor dissatisfied." Men (as compared with women), rural residents (as compared with urban residents), unmarried people (as compared with married people) have lower ratings of their quality of life. The hypothesis that children have a positive impact on the respondent's quality of life is confirmed, while the hypothesis that old-age pension affects it is not confirmed. Health status satisfaction shows tolerance to social and demographic factors. A positive average correlation of health status satisfaction and self-assessment of quality of life is identified in all social and age groups. The higher the age, the lower the self-assessment of the quality of life, and the health status satisfaction is even lower.

CONCLUSION: Men aged 60 and older living in rural areas are at risk based on low self-assessment ratings of quality of life in relation to low life expectancy. However, no gender differences were found in health satisfaction ratings.

Keywords: average life expectancy; causes of death; Grodno Region; population aged 60 and older; self-assessment of quality of life; health status satisfaction.

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ОРИГИНАЛЬНОЕ ИССЛЕДОВАНИЕ

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Медико-социологический анализ здоровья и качества жизни лиц в возрасте 60 лет и старше, проживающих в Гродненской области

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АННОТАЦИЯ

Обоснование. Понимание взаимосвязи самооценки здоровья и качества жизни с социально-демографическими факторами и показателями здоровья населения необходимо для выявления групп риска и обоснования развития здравоохранения в регионе.

Цель. Обосновать взаимосвязи показателей самооценки качества жизни и удовлетворённости состоянием здоровья с социально-демографическими факторами и объективными показателями здоровья у жителей Гродненской области в возрасте 60 лет и старше.

Методы. Проанализированы данные официальной демографической статистики и статистики здравоохранения, базы данных 1270 человек в возрасте 60 лет и старше, репрезентативной Гродненской области Республики Беларусь по полу, проживанию, возрасту (краткий опросник Всемирной организации здравоохранения для оценки качества жизни). Применены методы непараметрической статистики.

Результаты. Гродненская область демонстрирует значения ожидаемой продолжительности жизни при рождении близкие к среднереспубликанским. Минимальные значения во всех регионах выявляются у мужчин, проживающих в селе. В структуре причин смертности с отрывом лидируют болезни сердечно-сосудистой системы. При самооценке качества жизни преобладают варианты «хорошо» либо «ни плохо, ни хорошо», при самооценке удовлетворённости состоянием здоровья — «ни удовлетворён, ни не удовлетворён». Мужчины в сравнении с женщинами, жители села в сравнении с городскими жителями, не состоящие в браке в сравнении с состоящими в браке, оценивают качество жизни ниже. Подтверждается гипотеза о положительном влиянии на качество жизни наличия у респондента детей, гипотеза о влиянии пенсии по возрасту не подтверждается. Удовлетворённость здоровьем выявляет устойчивость к социально-демографическим факторам. Выявляется положительная средняя корреляционная связь между удовлетворённостью здоровьем и самооценкой качества жизни во всех социально-демографических группах. С увеличением возраста происходит снижение самооценки качества жизни и ещё более выраженное снижение удовлетворённости здоровьем.

Заключение. Мужчины в возрасте 60 лет и старше, проживающие в селе, составляют группу риска по низким самооценкам качества жизни во взаимосвязи с низкой продолжительностью предстоящей жизни. При этом в удовлетворённости здоровьем не выявлено гендерных различий.

Ключевые слова: средняя продолжительность предстоящей жизни; причины смертности населения; Гродненская область; население в возрасте 60 лет и старше; самооценка качества жизни; удовлетворённость здоровьем.

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BACKGROUND

Although being subjective, *self-rated health* is a simple and measurable factor, which can give relevant information on population health. In particular, it can be used as a proven mortality predictor and reflect people behavior towards their health and its maintenance. Health satisfaction indicators are used in clinical and epidemiological studies and checkup programs because of their proven sufficient (up to 80%) sensitivity for correspondence with objective health characteristics [1]. With the population aging, the use of self-rated health and health satisfaction can be very useful, especially if resources are scarce. For example, these indicators were proposed for screening for targeted preventive interventions in the elderly population [2].

In Belarus, 2024 was declared the *Year of Quality*. The national security concept of the Republic of Belarus implies an appropriate quality and standard of living of the population, which is an integral part of national security and is recorded in the concept itself: "In the social sphere, the Republic of Belarus intends to become one of the first 50 countries in the world with a high level of human development. The state's actions will be aimed at ensuring a decent standard and quality of life for the population by increasing real wages and other incomes, improving the pension system and targeted social assistance, and developing a system of state social standards, among other measures."[1]

In a medical and sociological analysis of population health, special attention is paid to health-related quality of life, which can be measured using many instruments, including those standardized by the World Health Organization. For this study, we used the World Health Organization's *WHOQOL-BREF quality of life assessment* (WHOQOL-26) [3, 4].

In Belarus, health-related quality of life was evaluated in individual studies [5–7], and their data cannot be pooled to present quality of life indicators for people aged 60 years and older (composite indicator and its components), find possibilities to improve them, and reach the existing potential for growth in health-related quality of life for this age group.

Objective parameters of population health include medical and demographic coefficients, primary and overall morbidity, primary disability, etc. For older age groups, overall mortality, mortality due to different causes, causes of mortality, and disability are of particular importance. Life expectancy is a standardized indicator of population health, which can be used as a target in most state programs aimed at maintaining and improving public health in Belarus. Official demographic statistics presented life expectancy at birth (open access until 2020) and life expectancy at age 65.[2, 3]

In people aged 60 years and older, studying a relationship between self-rated health or quality of life with social and demographic factors can help identify target risk groups, detect a heterogeneity in the population, and develop supporting measures. A further search for a relationship with objective health indicators will help develop medical and organizational measures and determine the forecast for the development of the healthcare system, considering the trend of population aging.

AIM

To evaluate indicators of self-rated quality of life or health satisfaction and their relationship with social and demographic factors and objective indicators of population health in people aged 60 years and older living in the Grodno region.

METHODS

We evaluated materials from a database [8] that included a population of 1270 people aged 60 years and older representative of the Grodno region, broken down by gender, place of residence (city or village), and age. Data were collected continuously from 06-Jun-2022 to 27-Nov-2023 in healthcare institutions of Grodno and Grodno region.

Exclusion criteria: respondent's refusal, inability to participate in the survey due to health reasons.

The WHOQOL-26 instrument was used. This questionnaire for health self-assessment contains the question "How satisfied are you with your health?" with the answers "Very dissatisfied" (1), "Dissatisfied" (2), "Neither satisfied nor dissatisfied" (3), "Satisfied" (4), and "Very satisfied" (5). To assess quality of life, the instrument contains the question "How would you rate your quality of life?" with the answers "Very poor" (1), "Poor" (2), "Neither poor nor good" (3), "Good" (4), and "Very good" (5).

We evaluated self-rated quality of life and health satisfaction, assessed a relationship with the objective indicators, and identified social and demographic groups at risk for low values.

Based on official statistics from the Ministry of Health of the Republic of Belarus [9–13] and state demographic statistics [14–16], we performed a medical and statistical comparative analysis to evaluate a relationship between subjective sociological indicators and objective health indicators in people aged 60 years and older living in the Grodno

[1] Decree 575 of the President of the Republic of Belarus of November 9, 2010 *On Approval of the National Security Concept of the Republic of Belarus*. Access mode: https://pravo.by/document/?guid=3871&p0=P31000575, accessed on 05-Jan-2024.

[2] Resolution 693 of the Council of Ministers of the Republic of Belarus of December 3, 2020 *On Active Longevity 2030 National Strategy of the Republic of Belarus*. Access mode: https://pravo.by/document/?guid=3871&p0=C22000693; accessed on 05-Jan-2024.

[3] Resolution 28 of the Council of Ministers of the Republic of Belarus of January 19, 2021 *On Public Health and Demographic Security State Program for 2021–2025.* Access mode: https://pravo.by/document/?guid=3871&p0=C22100028, accessed on 05-Jan-2024.

region; we used sociological research as a methodological basis for medical and sociological monitoring [17–20].

The following methods were used for statistical processing: χ^2 test (for between-group comparison by extensive indicators) and Kendall rank correlation coefficient (τ) with the Chaddock scale. The effect of age on self-rated quality of life and health satisfaction was assessed by testing a shift hypothesis against an ordered alternative hypothesis, for which the Jonckheere–Terpstra (z) was calculated based on pairwise statistics of the Mann–Whitney U test.

RESULTS

A retrospective analysis of official open-access statistical data for up to 2019 (inclusive) showed a progressive increase in average life expectancy, a universal indicator of population health.

In Belarus, life expectancy at the age of 65 and older was 14.7 years in 2010 and 16.1 years in 2019. Significant gender differences were found: in 2010, life expectancy in women exceeded that in men by 5 years (16.7 and 11.7 years, respectively), and by 2019 this gap increased slightly and was 5.3 years (18.2 and 12.9 years, respectively).

Life expectancy at birth increased by 4 years between 2010 and 2019 (to 74.5 years). This parameter increased both in women (from 76.5 to 79.3 years) and men (from 64.6 to 69.2 years) with the gender gap persisting.

In the Grodno region, life expectancy at birth in 2019 was 74.3 years (79.1 years for women and 69.2 years for men). Urban residents had this parameter higher than rural residents (75.7 and 70.4 years, respectively). The Grodno region demonstrated life expectancy at birth that was close to the national average value in comparison with other regions.

In the Grodno region, male rural residents aged 65.7 years had the lowest life expectancy at birth. Similar trends were found in all regions of Belarus.

In the period from 2019 to 2023 (inclusive) *cardiovascular disease* was the leading cause of death with a significant gap from other causes in people aged 60 years and older in the Grodno region. Cardiovascular disease was the cause of death in 77.5% of people aged 75–79 years in 2021 (the highest proportion) and 49.7% in people aged 60–64 years in 2019 (the lowest proportion).

Cancer was the second leading cause of death in people aged 60 years and older. In 2019, cancer-related mortality rate was 26.6% in people aged 60–64 years. Mortality rate from other causes (respiratory disease, gastrointestinal disease, external and other causes) was generally close to cancer-related mortality rate.

In people aged 75 years and older, the proportion of deaths from other causes increased, thus changing the ranking of causes of death with the second position shared by cancer and other causes of death.

The COVID-19 pandemic was not associated with any statistically significant changes in the ranking of leading mortality causes in the age groups under study.

In all people aged 60 years and older who lived in the Grodno region and died from cancer from 2019 to 2023, the age group of 60–64 years was prevalent, making up the maximum (in 2021, every fifth resident of the region died from cancer). In people aged 60 years and older who died from cardiovascular disease, people aged 80 years and older were prevalent, making up the maximum in 2021 (44.7% of all residents of the region who died from cardiovascular disease).

In residents of the Grodno region aged 60 years and older, most respondents [39.45%, 95% confidence interval (CI) 35.98–43.03] chose score 3 of the five-point scale to assess self-rated health. The proportions of "Dissatisfied" (answers 1 and 2 together) and "Satisfied" respondents (answers 4 and 5 together) were 27.64% and 32.91%, respectively, with statistically significant differences ($\chi^2 = 4.48$, $p = 0.0342$). Three ranking categories were identified; category 1 corresponded to score 3 of health satisfaction, category 2 to scores 4 or 5, and category 3 to scores 1 or 2 of health satisfaction.

Gender and residence differences were not statistically significant. Married respondents statistically significantly less often answered "Very dissatisfied" and statistically significantly more often answered "Satisfied"; for other answer options, differences were not statistically significant. Having children was statistically significant for choosing opposing answer options: respondents who did not have children answered slightly more often "Very dissatisfied" ($\chi^2 = 3.47$, $p = 0.0626$) and statistically significantly less often "Very satisfied" ($\chi^2 = 13.06$, $p = 0.0003$).

To evaluate the social and demographic characteristics of respondents who answered the question "How satisfied are you with your health?", we divided the participants into two groups: those who answered "Very dissatisfied" and "Dissatisfied" (Group 1) and those who answered "Neither satisfied nor dissatisfied", "Satisfied", or "Very satisfied" (Group 2). Respondents statistically insignificantly more often (52.44%) assessed their quality of life as below average and average (score 1–3) than as "Good" and "Very good" (score 4–5) (Table 1).

In respondents satisfied with their health (Group 1), the proportion of people who worked and did not receive a pension was statistically significantly higher than in respondents dissatisfied with their health, where the proportion of people who received a disability pension was higher. Disability is a consequence of health deterioration, whereas employment and no old-age pension indicate a younger age of the respondent, which objectively contributes to higher health satisfaction. Other social and demographic factors did not show any statistically significant effects.

Answers to the question "How would you rate your quality of life?" were distributed the following way (Fig. 1).

When this indicator was evaluated depending on the gender, most men (218, 47.39%) answered "Neither

Table 1. Demographic profile of respondents who answered the question "How satisfied are you with your health status?"

Demographic profile		Health status satisfaction. *n*/% (95% confidence interval)		Statistical significance
		Group 1 (*n* = 418)	Group 2 (*n* = 852)	
Sex	Male	145/34.69 (30.28–39.37)	315/36.97 (33.8–40.26)	$p > 0.05$
	Female	273/65.31 (60.63–69.72)	537/63.03 (59.74–66.2)	$p > 0.05$
Place of residence	Town	273/65.31 (60.63–69.72)	573/67.25 (64.03–70.32)	$p > 0.05$
	Village	145/34.69 (30.28–39.37)	279/32.75 (29.68–35.97)	$p > 0.05$
Employment	Yes	187/44.74 (40.04–49.53)	235/27.58 (24.69–30.68)	$\chi^2 = 17.92$, $p = 0.0000$
	No	231/55.26 (50.47–59.96)	617/72.42 (69.32–75.31)	$\chi^2 = 7.70$, $p = 0.0055$
Married	Yes	319/76.32 (72.01–80.14)	601/70.54 (67.39–73.5)	$p > 0.05$
	No	99/23.68 (19.86–27.99)	251/29.46 (26.5–32.61)	$p > 0.05$
Having children	Yes	379/90.67 (87.5–93.1)	754/88.5 (86.18–90.47)	$p > 0.05$
	No	39/9.33 (6.9–12.5)	98/11.5 (9.53–13.82)	$p > 0.05$
Living with children	Yes	76/18.18 (14.78–22.16)	152/17.84 (15.42–20.55)	$p > 0.05$
	No	342/81.82 (77.84–85.22)	700/82.16 (79.45–84.58)	$p > 0.05$
Receiving pension benefits	No	58/13.88 (10.31–18.41)	82/9.62 (7.47–12.32)	$\chi^2 = 4.09$, $p = 0.00432$
	Yes, retirement	345/82.54 (77.66–86.53)	679/79.69 (76.2–82.79)	$p > 0.05$
	Yes, disability	15/3.59 (1.96–6.47)	91/10.68 (8.41–13.48)	$\chi^2 = 15.97$, $p = 0.0001$

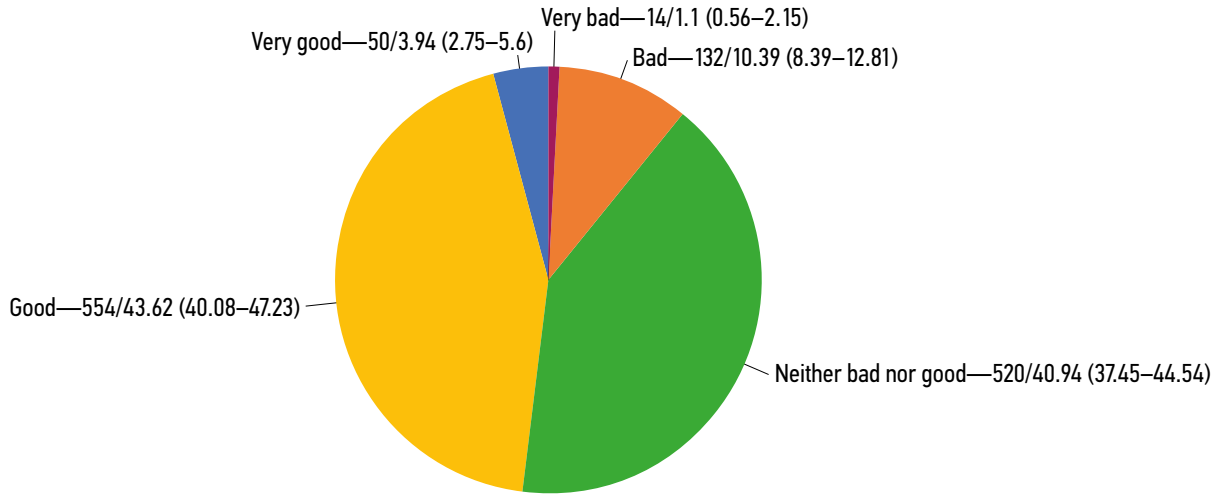

Fig. 1. Self-assessment of quality of life by persons aged 60 and older living in the Grodno Region (*n*=1,270).

poor nor good", whereas most women (397, 49.01%) answered "Good". The "Good" option ranked second in men (157 [34.13%]), and the "Neither poor nor good" option ranked second in women (302 [37.28%]).

To evaluate the social and demographic characteristics of respondents who answered the question "How would you rate your quality of life?", we divided the participants into two groups: those who answered "Good" and "Very good" (Group 1) and those who answered "Neither poor nor good", "Poor", or "Very poor" (Group 2).

The number of respondents in Group 2 (666, 52.44%) was more than in Group 1 (604, 47.56%); however, their 95% CIs overlapped (49.69–55.18% and 44.82–50.31%, respectively). Therefore, these differences were not statistically significant (Table 2).

Therefore, in respondents who reported "Good" and "Very good" quality of life, female urban residents with children predominated and married respondents clearly dominated. Living separately from children was more common in respondents who rated their quality of life as "Good" or "Very good"; however, this difference was not statistically significant vs respondents who rated their quality of life as "Neither poor nor good", "Poor", or "Very poor". Old-age pension was not a statistically significant factor, whereas disability pension was significantly more common for respondents with lower self-rated quality of life.

A moderate statistically significant positive correlation was found between self-rated quality of life and health satisfaction ($\tau = 0.461$, 95% CI 0.421–0.502, $p < 0.00001$). An increase in health satisfaction was associated with an increase in self-rated quality

Table 2. Demographic profile of respondents who answered the question "How satisfied are you with your health status?"

Demographic profile		Health status satisfaction, *n*/% (95 % confidence interval)		Statistical significance
		Group 1 (*n* = 604)	Group 2 (*n* = 666)	
Sex	Male	180/29.8 (26.29–33.57)	280/42.04 (38.35–45.83)	$\chi^2 = 20.54$, $p < 0.00001$
	Female	424/70.2 (66.43–73.71)	386/57.96 (54.17–61.65)	
Place of residence	Town	441/73.01 (69.34–76.4)	405/60.81 (57.05–64.45)	$\chi^2 = 21.21$, $p < 0.00001$
	Village	163/26.99 (23.6–30.66)	261/39.19 (35.55–42.95)	
Employment	Yes	251/41.56 (37.69–45.53)	171/25.68 (22.5–29.13)	$\chi^2 = 36$, $p < 0.00001$
	No	353/58.44 (54.47–62.31)	495/74.32 (70.87–77.5)	
Married	Yes	482/79.8 (76.42–82.81)	171/25.68 (22.5–29.13)	$\chi^2 = 371.47$, $p < 0.00001$
	No	122/20.2 (17.19–23.58)	495/74.32 (70.87–77.5)	
Having children	Yes	554/91.72 (89.25–93.66)	579/86.94 (84.16–89.29)	$\chi^2 = 7.57$, $p = 0.0061$
	No	50/8.28 (6.34–10.75)	87/13.06 (10.71–15.84)	
Living with children	Yes	96/15.89 (13.2–19.02)	132/19.82 (16.97–23.02)	$\chi^2 = 3.31$, $p = 0.0687$
	No	508/84.11 (80.98–86.8)	534/80.18 (76.98–83.03)	
Receiving pension benefits	No	66/10.93 (8.25–14.34)	74/11.11 (8.52–14.36)	—
	Yes, retirement	511/84.6 (80.76–87.79)	513/77.03 (72.9–80.69)	$\chi^2 = 1.25$, $p = 0.2643$
	Yes, disability	27/4.47 (2.85–6.95)	79/11.86 (9.18–15.19)	$\chi^2 = 19.22$, $p < 0.00001$

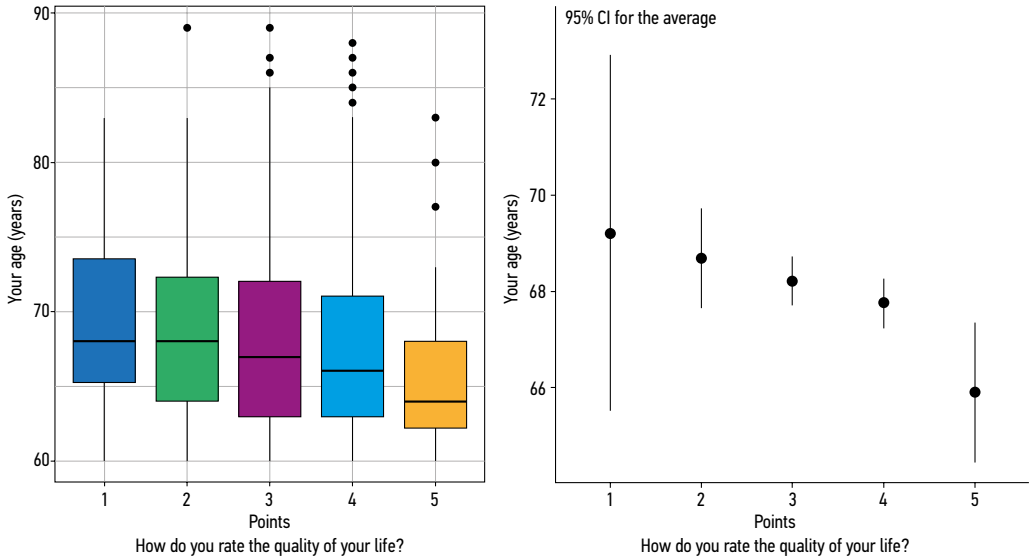

Fig. 2. Distribution box plot for "Your age" indicator in groups identified by the self-assessed value of quality of life.

of life in both men (τ = 0.494, 95% CI 0.427–0.562, $p < 0.00001$) and women (τ = 0.454, 95% CI 0.403–0.505, $p < 0.00001$), without any statistically significant gender differences. A moderate positive correlation was confirmed in urban residents (τ = 0.462, 95% CI 0.413–0.512, $p < 0.00001$) and rural residents (τ = 0.469, 95% CI 0.397–0.541, $p < 0.00001$).

Increased age was associated with a statistically significant decrease in self-rated quality of life (z = –3.0753, $p = 0.0011$) (Fig. 2).

With respondents' age increasing, their health satisfaction also decreased, with this decrease being more significant than for self-rated quality of life (z = –5.412, $p < 0.00001$) (Fig. 3).

DISCUSSION

The effect of social and demographic factors on health is obvious. According to previously published data, gender, age, marital status, social status, and special medical knowledge can influence self-esteem, quality of life, and self-rated health. In our study, we clearly showed several trends for the population of the Grodno region of the Republic of Belarus aged 60 years and older.

In contrast to self-rated quality of life, health satisfaction showed significant resistance to respondents' gender and urban/rural residence, with the first ranking category being unaffected by respondents' employment status, marital

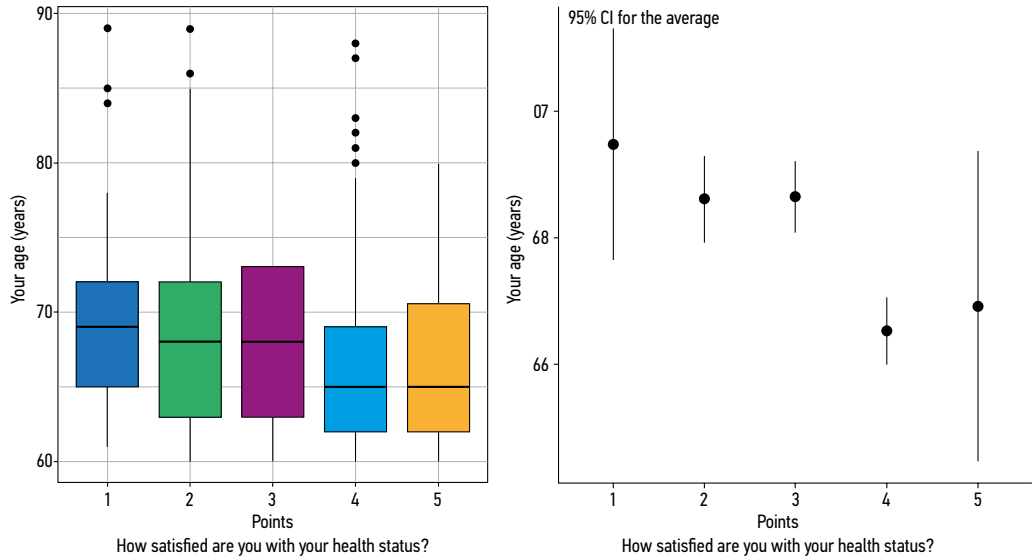

Fig. 3. Distribution box plot for "Your age" indicator in groups identified by the value of health status satisfaction.

status, parental status, or cohabitation with children. Most respondents [35.98–43.03%] chose option "3" of the five-point scale; the first ranking place corresponds to this answer (the second one to "4" or "5", the third to "1" or "2").

In a study in Moscow residents aged 55 years and older, only 10% of respondents assessed their health as good and 18.6% of respondents assessed it as poor. A multivariate analysis adjusted for gender, age, education, and marital status showed that arterial hypertension, smoking, and obesity were significantly associated with poor self-rated health [21].

If retirement-age people can work after reaching their retirement age, this significantly increases their subjective self-rated health. In employed women aged 55 to 65 years in 2018, the proportion of respondents who rated their health positively was more than 1.5 times higher (15.6% vs 9.8%), and the proportion of respondents who rated their health negatively was almost 2.5 times lower (10.4% vs 25.2%) vs unemployed women of the same age. A similar trend was seen in men aged 60–69 years, where the proportion of respondents who rated their health positively differed between employed and unemployed respondents 2 times (22.8% vs 11.1%), and the proportion of respondents who rated their health negatively differed 2.5 times but in the opposite direction (10.5% vs 27%). In all older age cohorts, employed respondents were significantly ahead of unemployed respondents in average self-rated health (50–59 years old, 3.02 vs 2.80; 60–69 years old, 2.98 vs 2.76; 70 years and older, 2.73 vs 2.44) [22].

We did not found any effect of respondents' employment status on their health satisfaction. Only in respondents receiving a disability pension, patterns of self-rated health satisfaction were different: low scores ("1" or "2") prevailed; the proportion of respondents who answered "Very dissatisfied" or "Dissatisfied" statistically significantly exceeded that in other groups (including respondents receiving an old-age pension); the proportion of respondents who answered "Satisfied" was the lowest statistically significantly.

Effects of social and demographic factors on self-rated quality of life showed different results. In residents of the Grodno region aged 60 years and older, most respondents answered "Good" (40.08–47.23%) or "Neither poor nor good" (37.45–44.54%). Men vs women, rural residents vs urban residents, and unmarried vs married people rated their quality of life lower. Therefore, gender had a significant effect. However, trends in this factor differed from studies that were conducted in Russia. According to the studies conducted in Russia in the late 20th and early 21st centuries, the proportion of women who rated their quality of life positively was 1.7–2 times lower than men. By the middle of the second decade of the 2000s, differences decreased and were 1.4–1.5 times; the proportion of people who rated their health as good or very good decreased to 9.7% in respondents aged 60–69 years and to 4% in respondents aged 70 years and older, whereas the proportion of respondents who rated their health as poor or very poor increased to 23.3% and 49.0%, respectively [23].

Therefore, the effect of gender on self-rated quality of life may be specific for the Belorussian population or for the population of the Grodno region, thus requiring further studies.

We confirmed a hypothesis about a positive effect of having children on self-rated quality of life. However, living together with children did not always have a positive effect. Living separately from children was more common in respondents who rated their quality of life as "Good" or "Very good"; however, these differences were not statistically significant. Old-age pension did not have any statistically significant effect on self-rated quality of life. In working respondents, pension was not a statistically significant factor to influence self-rated quality of life. Disability pension was statistically significantly more common among respondents with lower self-rated quality of life.

CONCLUSION

Despite a relationship between self-rated quality of life and health, effects of social and demographic factors on these indicators were not similar. Health satisfaction showed significant resistance to social and demographic factors (gender, urban/rural residence), and the first ranking category (35.98–43.03%, score 3 of the 5-point scale) did not depend on respondents' employment status, marital status, parental status, or cohabitation with children.

An increase in health satisfaction was associated with a statistically significant increase in self-rated quality of life in all social and demographic groups. With respondents' age increasing, their self-rated quality of life decreased statistically significantly and health satisfaction decreased even more.

The Grodno region demonstrated life expectancy at birth that was close to the national average level in comparison with other regions. In all regions, the lowest levels were seen in male rural residents. Cardiovascular disease was the leading cause of death.

Male rural residents aged 60 years and older constitute a risk group for low self-rated quality of life with a relationship with a low life expectancy. However, no gender differences were found in health satisfaction.

ADDITIONAL INFORMATION

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