# Factors determining health behaviours of the 50+ population with cardiovascular diseases

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D – Writing the article, E – Critical revision of the article, F – Final approval of article

## ▌Abstract

**Introduction.** The biggest threat to life are cardiovascular diseases which are a serious problem in Poland, Europe, and worldwide. Therefore, it has become important to have proper health behaviours which significantly eliminate the occurrence and development of cardiovascular diseases.

**Objective.** The main aim of this study is to present factors that determine health behaviours of the 50+ population with cardiovascular diseases.

**Materials and metod.** The study was carried out among 411 individuals aged over 50 with cardiovascular diseases. The method used was a diagnostic survey. The study involved an authors' survey questionnaire and the Inventory of Health-Related Behaviours (IHB). A detailed statistical analysis was carried out in the R programme, version 3.5.1.

**Results.** The most common disease in the study group was coronary heart disease – 63.75%. The majority of respondents showed (via Inventory of Health-Related Behaviour [IHB]) that the level of their health behaviours was moderate – 41.12%; the highest level of health behaviours in the study group were related to health practices, while a slightly lower level was observed in the area of positive mental attitude. Statistical significance was also found between the level of intensity of health behaviours and age, gender, BMI, place of residence, education, professional activity and marital status of the respondents.

**Conclusions.** Anti-health behaviours were predominant among the respondents; significant demographic and social factors determining health behaviour were determined, such as age and gender; a high level of health behaviours was found in the group of women with higher education and correct body mass, living in cities and married.

## ▌Key words

health, cardiovascular diseases, health behaviours, people aged 50+

## INTRODUCTION

In recent years it has been shown that the health situation of school-age children and adolescents, adults, and the elderly in Poland and worldwoide has significantly deteriorated [1, 2, 3, 4, 5]. The contemporary population is ageing [6, 7]. Life expectancy in Poland increases but it remains significantly shorter than the average value in the European Union (EU) by approximately 4 years. The development of civilization and increasing life expectancy have become the main factors contributing to the unsatisfactory health status of the population, especially the 50+ group. Currently, the most common health hazards for this age group are: low physical activity, ignoring the principles of rational nutrition, use of stimulants, insufficient sleep and bad quality of sleep. Incorrect health behaviours lead to the development of diseases such as: overweight and obesity, diabetes, cardiovascular diseases, respiratory diseases, and disorders of the musculoskeletal system [3, 7, 8, 9, 10, 11].

The biggest threat to life are cardiovascular disease, which are a serious problem in terms of medicine, social life and

the economy [12, 13, 14, 15, 16, 17]. Cardiovascular diseases have an epidemiological nature and are therefore referred to as 'civilization diseases'. They are the most common causes of death in Poland, Europe and worldwide, and often cause physical and mental disability. They require huge financial funding, both in terms of public finances and individual patient spending [14, 17, 18, 19].

At the beginning of the 21st century, the care of a patient with cardiovascular disease changed enormously, with a great deal of progress in the diagnosis and therapy of these diseases [18, 19, 20]. Public spending on the medical care of patients with these diseases has also increased significantly. Despite such a large transformation, the problem still remains significant; for example, a noticeable reduction in the mortality of patients in the early period of myocardial infarction does not correlate with a lower overall mortality due to cardiovascular diseases [13, 14]. Therefore, it is currently believed that the most effective method of reducing the epidemiological risk of cardiovascular diseases is adequate prevention. Assessment of cardiovascular risk and attempts to modify or eliminate existing risk factors in individual patients are basic preventive measures [18, 20, 21, 22].To-date, research has shown that a healthy lifestyle is a decisive factor in maintaining and strengthening public health [23, 24, 25, 26, 27].

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Despite the popular belief that caring for health is important, the declarations of Poles regarding care for their own health do not correlate positively with observed health practices. People aged 50+ display predominantly anti-health behaviours that may result in the occurrence of many diseases, including cardiovascular disease. Many individual and environmental factors influence the shaping of health behaviours. An anti-health lifestyle causes degradation of health and its gradual or rapid loss. A properly shaped, healthy way of life improves the health of the individual, and consequently, the health of the population. Lifestyle is considered to be the main factor as it determines health in over 50% [28, 29, 30].

Social education, unfortunately, is not always fully effective; therefore, it is justified to conduct research to identify preferred health behaviours for specific groups of people. To modify the health behaviours of adult Poles, it is necessary to increase knowledge on the mechanisms responsible for behaviour change. This allows for an in-depth analysis of the implementation of actions aimed at improving the health of the population [22, 29, 31, 32, 33].

## OBJECTIVE

The main aim of the study is to assess the health behaviours of the 50+ population with cardiovascular diseases.

## MATERIALS AND METHOD

The research was carried out in 2018 among 411 individuals aged 50+ with cardiovascular disease. The criterion for inclusion in the study group was: age – people over 50; gender – men and women with diagnosed cardiovascular disease and hospitalized in the Independent Public Health Care Unit in Sanok, Subcarpathinan Province, in south-eastern Poland.

Overview of the study group: the group was dominated by men – 223 (54.26%), and 186 women (45.26%). Age structure of the study group: average age of the respondents – 69.2 (SD=9.45, and ranged from 50 – 93); median – 69. The first and third quartiles were 62 and 76, respectively; hence the study group was dominated by people aged 62–76.

Patients with cardiovascular diseases had their body mass and height measured at hospital admission. Based on these data, their Body Mass Index (BMI) was calculated. The BMI was significant in assessing the risk of developing overweight- and obesity-related diseases, for example, ischemic heart disease or atherosclerosis. Given the above, the body mass in the examined group was as follows: 157 respondents (38.20%) were overweight, 125 (30.41%) suffered from class 1 obesity, 100 individuals (24.33%) had correct body mass; 15 individuals (3.65%) had class 2 obesity, while 8 respondents (1.95%) suffered from class 3 obesity.

Place of residence of the study group: the most numerous group were inhabitants of cities with a population than 100,000 – 223 people (54.26%), while rural areas were populated by 183 people (44.53%).

Education of the study group: the proportion of people with vocational education was the highest – 191 (46.47%), while 145 people (35.28%) reported secondary education. There were 50 people with elementary education (12.17%) and 22 with higher education (5.35%).

In the study group, the majority, 313 people (76.16%) were professionally inactive, while 84 people (20.44%) were still active. No response was obtained from 14 people (3.41%).

Marital status: the largest group were married people – 311 respondents (75.67%), followed by widows and widowers – 73 (17.76%), maidens and bachelors – 12 (2.92%), divorced – 7 (1.70%) and those living in partnerships – 5 (1.22%).

Analysing the incidence of cardiovascular diseases amongst respondents, it was found that 262 people (63.75%) had coronary heart disease; which was followed by: atherosclerosis – 240 people (58.39%), hypertension – 162 (39, 42%), lower limb varicose veins – 109 (26.52%) and arrhythmia and cardiac conduction disturbances – 105 people (25.55%). There were 29 respondents with heart defects (7.06%) and 28 with venous thrombosis (6.81%) (Tab. 1).

The method used in the study was a diagnostic survey and the first of two research tools an authors' 3-part survey questionnaire. The first part focused on social information, the second part – health of the study group, and the third – their lifestyle. The second tool was the Inventory of Health-Related Behaviours (IHB) by Z. Juczyński [34]. The questionnaire consisted of 24 statements describing various types of health-related behaviours. Its use helps determine the intensity of four different health categories: eating habits (primarily the type of food consumed), preventive behaviours (compliance with health recommendations, obtaining information about health and illness), positive mental attitude (including psychological factors, such as avoiding too strong emotions, stress and tension, or depressing situations), and health practices (daily sleep and recreation habits).

The study was approved by the Bioethics Committee of the Medical University of Lodz (No. RNN/156/18/KE).

Statistical analysis was carried out in the R programme, version 3.5.1. Analysis of quantitative variables (i.e. expressed in numbers) was performed by calculating the mean, standard deviation, median, quartiles, minimum and maximum values. Analysis of qualitative variables (i.e. not expressed in numbers) was performed by calculating the number and percentage of occurrences of each value. Comparison of the values of quantitative variables in two groups was made using the Student's t test (when the variable had normal distribution in these groups) or the Mann-Whitney test (non-normal distribution). Comparison of the values of quantitative variables in three or more groups was made using ANOVA variance analysis (when the variable had normal distribution in these groups) or the Kruskal-Wallis test (non-normal distribution). After detecting statistically significant differences, *post-hoc* analysis was carried out with Fisher's LSD test (normal distribution) or Dunn's test (non-normal distribution) to identify statistically significant differences between groups. Correlations between quantitative variables were analysed using the Pearson correlation coefficient (when both variables had normal distribution) or Spearman correlation coefficient (otherwise). The strength of dependence was interpreted according to the following scheme:

$|r| \geq 0.9$ – very strong dependence;
$0.7 \leq |r| < 0.9$ – strong dependence;
$0.5 \leq |r| < 0.7$ – medium dependence;
$0.3 \leq |r| < 0.5$ – weak dependence;
$|r| < 0,3$ – very week dependence (negligible) [35].

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**Table 1.** Characteristics of the study group.

| Lp. | Characteristics of the study group | | N | % |
|---|---|---|---|---|
| 1. | Gender | Women | 186 | 45.26% |
| 2. | | Men | 223 | 54.26% |
| 3. | | No answer | 2 | 0.49% |
| 4. | Age [in years] | N – 411 | - | - |
| 5. | | Mean – 69.2 | - | - |
| 6. | | SD – 9.45 | - | - |
| 7. | | Mediana – 69 | - | - |
| 8. | | Min – 50 | - | - |
| 9. | | Max – 93 | - | - |
| 10. | | Q1 – 62 | - | - |
| 11. | | Q3 – 76 | - | - |
| 12. | BMI | Underweight [17–18.5] | 2 | 0.49% |
| 13. | | Correct weight [18.5–25 | 100 | 24.33% |
| 14. | | Overweight [25–30] | 157 | 38.20% |
| 15. | | Obesity [30–35] | 125 | 30.41% |
| 16. | | Class 2 obesity [35–40] | 15 | 3.65% |
| 17. | | Class 3 obesity [>40] | 8 | 1.95% |
| 18. | | No data available (weight and/or height) | 4 | 0.97% |
| 19. | Place of residence | City <100,000 inhabitants | 223 | 54.26% |
| 20. | | City > 100,000 inhabitants | 3 | 0.73% |
| 21. | | Rural area | 183 | 44.53% |
| 22. | | No answer | 2 | 0.49% |
| 23. | Education | Primary | 50 | 12.17% |
| 24. | | Vocational | 191 | 46.47% |
| 25. | | Secondary | 145 | 35.28% |
| 26. | | Higher | 22 | 5.35% |
| 27. | | No answer | 3 | 0.73% |
| 28. | Professional activity | Professionally active | 84 | 20.44% |
| 29. | | Professionally inactive | 313 | 76.16% |
| 30. | | No answer | 14 | 3.41% |
| 31. | Marital status | Single | 12 | 2.92% |
| 32. | | Married | 311 | 75.67% |
| 33. | | In separation | 2 | 0.49% |
| 34. | | Divorced | 7 | 1.70% |
| 35. | | Widow/widower | 73 | 17.76% |
| 36. | | In a partnership | 5 | 1.22% |
| 37. | | No answer | 1 | 0.24% |
| 38. | Treatment of cardiovascular disease | Hypertension | 162 | 39.42% |
| | | Atherosclerosis | 240 | 58.39% |
| | | Ischemic heart disease | 262 | 63.75% |
| | | Rhythm and cardiac conduction disorders | 105 | 25.55% |
| | | Heart defects (congenital and acquired) | 29 | 7.06% |
| | | Varicose veins of the lower extremities | 109 | 26.52% |
| | | Venous thrombosis | 28 | 6.81% |
| | | Other diseases | 43 | 10.46% |

## RESULTS

Analysis of the results using the Inventory of Health-Related Behaviours (IHB) of the study group aged 50+ hospitalized due to cardiovascular diseases, showed that in as many as 41.12% of cases there was an average intensity of health behaviours, 33.09% of respondents displayed high intensity, while 25.30% – low intensity (Tab. 2). Analysis of the study

**Table 2.** Intensity levels of health behaviours among respondents according to IHB

| IHB –No. of points | | Interpretation | n | % |
|---|---|---|---|---|
| Women | Men | | | |
| 24–77 | 24–71 | Low level of health behaviours | 104 | 25.30% |
| 78–91 | 72–86 | Average level of health behaviours | 169 | 41.12% |
| 92–120 | 87–120 | High level of health behaviours | 136 | 33.09% |
| - | - | Gender not specified | 2 | 0.49% |

results also showed that the most common health behaviours were related to health practices, slightly less common in the area of positive mental attitude and the least common in the area of proper eating habits and preventive behaviours (Tab. 3).

**Table 3.** Degree of intensity of specific categories of health behaviours according to IHB amongst respondents.

| IHB sub-scales | N | Mean | SD | Median | Min | Max | Q1 | Q3 |
|---|---|---|---|---|---|---|---|---|
| Correct eating habits | 411 | 3.28 | 0.75 | 3.17 | 1 | 5 | 2.83 | 4 |
| Preventive behaviours | 411 | 3 | 0.62 | 3 | 1.17 | 4.5 | 2.67 | 3.67 |
| Positive mental attitude | 411 | 3.59 | 0.52 | 3.83 | 1.33 | 4.67 | 3.33 | 4 |
| Health practices | 411 | 3.61 | 0.53 | 3.67 | 1.67 | 4.83 | 3.33 | 4 |

As a result of the research analysis, significantly significant dependencies were discovered between the following groups (p<0.05): the group with a high level of health behaviours was dominated by women, while groups with low and medium levels of health behaviours were dominated by men; in the group with a high level of health behaviours, the majority of the study group had normal body weight, while in groups with a low and medium health behaviour level, respondents were usually overweight. The following were also observed:
– the higher the level of health behaviour, the greater the percentage of city-dwellers;
– the higher the level of health behaviour, the higher the level of education;
– the higher the level of health behaviours, the greater the percentage of married respondents (Tab. 4).

Analysis of the research results showed that age correlated significantly and positively with health practices (p<0.05); the group of elderly respondents had a greater intensity of health practices (Tab. 5). Statistical relationships were found between health behaviours in each of the areas studied and gender (p<0.05). Women displayed more intense behaviours in each area than men (Tab. 6).

As a result of the research analysis, it was found that health behaviours in each area significantly depended on the body mass index (BMI) (p<0.05). Overweight respondents had less intense behaviours than correct weight patients in each area. Obese respondents had the least intense behaviours in all areas (Tab. 7). It was also found that health behaviours in each area significantly depended on the place of residence

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**Table 4.** Intensity level of health behaviours according to IHB versus age, gender, BMI, place of residence, education, professional activity and marital status of respondents

| Feature | | Low | Average | High | p * |
|---|---|---|---|---|---|
| Age | Mean ± SD | 68.55±10.2 | 70.02±9.12 | 68.73±9.31 | 0.349 |
| | Median | 69 | 71 | 68.5 | P |
| | Quartiles | 61–76 | 63–77 | 63–74 | |
| Gender | Females | 41 (39.42%) | 65 (38.46%) | 80 (58.82%) | 0.001 |
| | Males | 63 (60.58%) | 104 (61.54%) | 56 (41.18%) | chi2 |
| BMI | Underweight, correct weight | 20 (19.23%) | 35 (20.71%) | 47 (34.56%) | <0.001 |
| | Overweight | 38 (36.54%) | 49 (28.99%) | 69 (50.74%) | chi2 |
| | Obesity | 45 (43.27%) | 83 (49.11%) | 19 (13.97%) | |
| | No data | 1 (0.96%) | 2 (1.18%) | 1 (0.74%) | |
| Place of residence | Urban | 43 (41.35%) | 80 (47.34%) | 101 (74.26%) | <0.001 |
| | Rural | 60 (57.69%) | 88 (52.07%) | 35 (25.74%) | chi2 |
| | No data | 1 (0.96%) | 1 (0.59%) | 0 (0.00%) | |
| Education | Primary | 29 (27.88%) | 16 (9.47%) | 5 (3.68%) | <0.001 |
| | Vocational | 52 (50.00%) | 86 (50.89%) | 51 (37.50%) | chi2 |
| | Secondary | 21 (20.19%) | 55 (32.54%) | 69 (50.74%) | |
| | Higher | 1 (0.96%) | 10 (5.92%) | 11 (8.09%) | |
| | No data | 1 (0.96%) | 2 (1.18%) | 0 (0.00%) | |
| Professional activity | Professionally active | 20 (19.23%) | 30 (17.75%) | 34 (25.00%) | 0.283 |
| | Professionally inactive | 79 (75.96%) | 134 (79.29%) | 98 (72.06%) | chi2 |
| | No data | 5 (4.81%) | 5 (2.96%) | 4 (2.94%) | |
| Marital status | Married | 65 (62.50%) | 130 (76.92%) | 114 (83.82%) | <0.001 |
| | Other | 39 (37.50%) | 39 (23.08%) | 21 (15.44%) | chi2 |
| | No data | 0 (0.00%) | 0 (0.00%) | 1 (0.74%) | |

*chi2 – chi-square test; F – Fisher's exact test (low values expected in the Table); P – normal distribution, parametric analysis, ANOVA + *post-hoc* analysis (Fisher's LSD); NP – non-normal distribution, non-parametric analysis, Kruskal-Wallis test + post-hoc analysis (Dunn test).

**Table 5.** Categories of health behaviours according to IHB versus respondents' age

| IHB | Correlation with age | | | |
|---|---|---|---|---|
| | Correlation coefficient | p * | Dependency direction | Strength of dependence |
| Correct eating habits | -0.089 | p=0.07 NP | --- | --- |
| Preventive behaviours | -0.057 | p=0.253 NP | --- | --- |
| Positive mental attitude | 0.045 | p=0.366 NP | --- | --- |
| Health practices | 0.251 | p<0.001 NP | positive | very weak |

*P – Normal distribution of both correlated variables, Pearson correlation coefficient; NP – No normal distribution of at least one of the correlated variables, Spearman's correlation coefficient.

**Table 6.** Categories of health behaviours according to IHB versus respondents' gender

| IHB | | Women | Men | p * |
|---|---|---|---|---|
| Correct eating habits | mean ± SD | 3.59±0.63 | 3.03±0.74 | <0.001 |
| | median | 3.83 | 3 | NP |
| | quartiles | 3–4 | 2.67–3.67 | |
| Preventive behaviours | mean ± SD | 3.25±0.57 | 2.79±0.59 | <0.001 |
| | median | 3.33 | 2.83 | NP |
| | quartiles | 2.83–3.67 | 2.5–3.08 | |
| Positive mental attitude | mean ± SD | 3.7±0.5 | 3.5±0.52 | <0.001 |
| | median | 4 | 3.67 | NP |
| | quartiles | 3.5–4 | 3.17–3.83 | |
| Health practices | mean ± SD | 3.81±0.43 | 3.44±0.54 | <0.001 |
| | median | 4 | 3.5 | NP |
| | quartiles | 3.67–4 | 3.08–3.83 | |

*P – Normal distribution in groups, Student's t-test; NP – No normal distribution in groups, Mann-Whitney test.

**Table 7.** Categories of health behaviours according to IHB versus respondents' BMI.

| IHB | | Underweight, correct weight | Overweight | Obesity | p * |
|---|---|---|---|---|---|
| Correct eating habits | mean±SD | 3.52±0.75 | 3.42±0.74 | 2.96±0.63 | <0.001 |
| | median | 4 | 3.67 | 3 | NP |
| | quartiles | 3–4 | 3–4 | 2.83–3 | Under-Norm. Over>0 |
| Preventive behaviours | mean±SD | 3.13±0.69 | 3.09±0.63 | 2.8±0.51 | <0.001 |
| | median | 3.33 | 3 | 2.83 | NP |
| | quartiles | 2.54–3.67 | 2.67–3.67 | 2.67–3 | Under-Norm. Over>0 |
| Positive mental attitude | mean±SD | 3.67±0.49 | 3.6±0.56 | 3.52±0.48 | <0.001 |
| | median | 4 | 3.83 | 3.67 | NP |
| | quartiles | 3.33–4 | 3.33–4 | 3.17–3.83 | Under-Norm. Over>0 |
| Health practices | mean±SD | 3.77±0.53 | 3.62±0.53 | 3.47±0.49 | 0.001 |
| | median | 4 | 3.83 | 3.5 | NP |
| | quartiles | 3.67–4 | 3.33–4 | 3.17–3.83 | Under-Norm. Over>0 |

*P – Normal distribution in groups, ANOVA + results of *post-hoc* analysis (Fisher's LSD test); NP – No normal distribution in groups, Kruskal-Wallis test + post-hoc analysis results (Dunn's test).

(p<0.05). City-dwellers had more intense behaviours in each area than residents of the rural environment (Tab. 8).

On analysing the impact of education on general health behaviours, it was found that health behaviours in each area significantly depended on education (p<0.05).

A *post-hoc* analysis was performed which discovered significant relationships:

– the higher the education level of the respondents, the more correct the eating habits;
– people with higher and secondary education had more intense preventive behaviours than those with vocational education, while their behaviours were more intense than those of people with primary education;
– people with secondary education had a more positive mental attitude than other respondents;
– people with vocational education had a more positive attitude than people with primary education;
– people with higher education displayed a greater intensity of health practices than people with primary and vocational education;
– people with secondary education displayed a greater intensity of these practices than people with vocational education (Tab. 9).

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**Table 8.** Categories of health behaviours according to IHB versus respondents' place of residence

| IHB | | Urban | Rural | p * |
|---|---|---|---|---|
| Correct eating habits | mean ± SD | 3.48±0.68 | 3.04±0.75 | <0.001 |
| | median | 3.83 | 3 | NP |
| | quartiles | 3–4 | 2.67–3.67 | |
| Preventive behaviours | mean ± SD | 3.16±0.58 | 2.8±0.61 | <0.001 |
| | median | 3.17 | 2.83 | NP |
| | quartiles | 2.83–3.67 | 2.5–3.08 | |
| Positive mental attitude | mean ± SD | 3.66±0.49 | 3.51±0.54 | 0.001 |
| | median | 3.83 | 3.67 | NP |
| | quartiles | 3.33–4 | 3.17–3.92 | |
| Health practices | mean ± SD | 3.67±0.5 | 3.53±0.55 | 0.007 |
| | median | 3.83 | 3.67 | NP |
| | quartiles | 3.33–4 | 3.25–4 | |

*P – Normal distribution in groups, Student's t-test; NP – No normal distribution in groups, Mann-Whitney test.

**Table 9.** Categories of health behaviours according to IHB versus respondents' education

| IHB | | Primary | Vocational | Secondary | Higher | p * |
|---|---|---|---|---|---|---|
| Correct eating habits | mean±SD | 2.79±0.81 | 3.1±0.72 | 3.56±0.59 | 4.08±0.44 | <0.001 |
| | median | 2.58 | 3 | 3.83 | 4.08 | NP |
| | quartiles | 2.17–3.33 | 2.83–3.83 | 3–4 | 3.71–4.33 | H> S > V> P |
| Preventive behaviours | mean±SD | 2.47±0.66 | 2.92±0.58 | 3.22±0.55 | 3.39±0.46 | <0.001 |
| | median | 2.42 | 2.83 | 3.33 | 3.33 | NP |
| | quartiles | 2–2.83 | 2.67–3.33 | 2.83–3.67 | 3–3.79 | H. S > V> P |
| Positive mental attitude | mean±SD | 3.29±0.71 | 3.59±0.46 | 3.72±0.45 | 3.55±0.66 | <0.001 |
| | median | 3.33 | 3.83 | 4 | 3.67 | NP |
| | quartiles | 2.83–3.83 | 3.33–4 | 3.5–4 | 3.21–4 | S>V.H.P V>P |
| Health practices | mean ± SD | 3.61±0.55 | 3.5±0.54 | 3.72±0.46 | 3.8±0.62 | <0.001 |
| | median | 3.67 | 3.5 | 3.83 | 4 | NP |
| | quartiles | 3.21–4 | 3.17–4 | 3.5–4 | 3.5–4.17 | H>P.V S>V |

*P – Normal distribution in groups, ANOVA + results of *post-hoc* analysis (Fisher's LSD test); NP – No normal distribution in groups, Kruskal-Wallis test + *post-hoc* analysis results (Dunn's test).

## DISCUSSION

Not following a healthy lifestyle is a risk factor of modern civilization diseases because the health of an individual is mainly determined by their individual health behaviours [26, 28]. It is estimated that the main cause of death in developing and developed countries are cardiovascular diseases [4, 13]. According to forecasts, the incidence of cardiological diseases in Europe in 2015–2025 will increase by 9–16%, depending on the region [4, 18, 36]. In Europe, male over-mortality rate is observed, as well as an increased incidence of diseases among women, which increases with age and among the oldest age group [4]. Cardiovascular diseases still remain the most common cause of death among men and women aged 45–59 and those aged over 60 [13, 14, 15].

As a result of authors' own research, the most common disease in the study group were: ischemic heart disease, hypertension and atherosclerosis. Similar results were obtained in other studies which also highlighted the frequent incidence of arrhythmias and cardiac conduction disorders [13, 18, 36].

The analysis of authors' own research, based on the Inventory of Health-Related Behaviour (IHB), showed that in as many as 41.12% of cases there was a medium intensity of health behaviours: 33.09% of respondents displayed high intensity, while 25.30% – low intensity. These results of health behaviours assessment are comparable with the results of other study groups. A similar result was obtained among older individuals (IHB – average score) [30, 33], academic youth (IHB – mostly average, in some areas low) [3] and medical students in Lublin and Warsaw (IHB – average score) [25]. Analysis of the study results showed that among respondents the most common health behaviours were related to health practices, slightly less common in the area of positive mental attitude, and the least common in the area of proper eating habits and preventive behaviours.

Authors' own research showed statistically significant differences between the level of intensity of health behaviours and age, gender, BMI, place of residence, education, professional activity and marital status of respondents. In numerous studies [4, 28, 29, 32, 33], it has been noticed that there is a strong correlation between the level of health behaviours and education. People with a higher education were characterized by a high level of health behaviours.

The intensity levels of health behaviours according to the Juczyński's IHB Questionnaire correlate significantly with the gender of the respondents. Authors' own research shows that the average level of health behaviours of men and women is diverse and is at an average level of 84.5; this is slightly lower than in the study of E. Sygit-Kowalkowska et al., which amounted to 86.8 [30]. Even higher results were obtained by researchers in 2011 in Sanok (E. Smoleń et al.), where the overall IHB index was 88.39 [29]. Statistical relationships were found between health behaviours in each of the areas studied and gender. Women displayed more intense behaviours in each area than men.

Authors' own research has shown that the impact of age on individual categories of health behaviours according to the IHB Questionnaire was significant. Research by E. Smoleń et al. showed that the older the respondents, the lower the intensity in all categories: preventive behaviours, correct eating habits, positive mental attitude and health practices [29]. In authors' own research, it was observed that the age of people over 50 significantly affected only health practices. Analysis of the research results also showed that health behaviours in each of the areas (apart from a positive mental attitude) depended significantly on the professional activity of respondents. Professionally active respondents had more correct eating habits, more intense preventive behaviours, and less intense health practices than respondents who did not work.

When analysing the impact of education on authors' own study on general health behaviours, it was found that health behaviours in each area significantly depended on education. It was shown that the higher the education of the respondents, the more correct the eating habits and preventive behaviours, and the more positive the mental attitude the greater the intensity of the health practices. Similar relationships were

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observed in the study by M. Muszalik et al., who showed that people with higher education displayed a significantly higher level in the category of health behaviours [33]; however, A. Delug did not find statistically significant correlations between health habits and education [7].

Because of the increasingly more elderly people in the Polish population, it is important to help them maintain their social, professional and family life for as long as possible. One of the priorities of the Ministry of Health in maintaining the good health of seniors is the preparation of a health care system that takes into account the disability of older patients, as well as enabling the earliest detection and simultaneous treatment of many diseases. Preventive programmes for the elderly help achieve this aim. The health policy programme 'POLKARD Cardiovascular Prevention and Treatment Programme 2017–2020' should be mentioned. The aim of the programme is to reduce the mortality rate of cardiovascular diseases in Poland by, among others, conducting nationwide primary prevention of cardiovascular diseases, conducting screening tests for abdominal aortic aneurysm in persons aged 65+, as well as retrofitting and supply of medical equipment to medical facilities involved in the diagnosis and treatment of cardiovascular diseases [37].

PolSenior1 and PolSenior 2 are other nationwide programmes aimed at implementing preventive measures targeted at seniors. In September 2018, nationwide data collection for PolSenior 2 began. These activities were preceded by several months of preparations devoted to developing the best possible research methodology. By 2020, a representative group of approximately 6,000 people in seven equal age groups will have been examined in PolSenior2, i.e. 60–64, 65–69, 70–74, 75–79, 80–84, 85–89, and 90+. The study should help obtain comprehensive, interdisciplinary knowledge about the population of people aged 60+ in Poland, with particular emphasis on the oldest seniors, and facilitate the design of changes in the healthcare system, including preventive actions regarding: promotion of health-promoting behaviours, teaching about healthy nutrition and increasing seniors' access to modern technologies [38, 39].

Following proper health behaviours is a key to maintaining good health and, above all, preventing civilization diseases, including cardiovascular diseases. To sum up, it should be stated that the lifestyle of the respondents should be modified through the implementation of education in the field of health prevention. The age of the study group (50+) was already in itself a risk factor for cardiovascular diseases; therefore, the coexistence of additional factors – such as obesity, elevated levels of cholesterol, glucose, triglycerides in the blood, and hypertension – had a negative impact on the health status of the studied population. It is important to attempt the promotion of health in the hierarchy of values of people over 50, and to strengthen their responsibility for their own health and lives [1, 2, 7, 22, 23, 28]. Broadly understood education should help raise public health awareness.

## CONCLUSIONS

The following socio-demographic factors determined the health behaviours of the study group: gender, age, place of residence, education of the respondents, professional activity, and marital status, and analysis of the results with a standardized Inventory of Health-Related Behaviours (IHB) showed the following:
– Among the study group, the elderly showed a greater intensity of health behaviours in the area of health practices.
– Among female respondents, there was a greater level of health behaviours in each studied area, compared to men.
– Health behaviours in each area significantly depended on the body mass index (BMI) and the education of the study group.

Practical indications:
1) Health-promoting behaviours, which are an important element in the prevention of cardiovascular diseases, should be implemented from an early age.
2) Anti-health behaviours should be modified and changed into health-promoting behaviours in order to eliminate (or significantly reduce) health and life risk factors of cardiovascular diseases.
3) In pro-family policy, the issue of prevention of cardiovascular diseases must become a priority, expressed by implementation of health promotion programmes, including health education for Polish families in both urban and rural areas.
4) Preventive programmes against cardiovascular diseases should take into account environmental, demographic and social conditions, and include people of all ages, from early childhood to late old age.

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