

Cardiovascular health knowledge of the Polish population. Comparison of two national multicentre health surveys: WOBASZ and WOBASZ II

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Abstract

Background and aim: To compare the cardiovascular health knowledge (CHK) of the adult Polish population in the years 2003–2005 and 2013–2014, and to evaluate the CHK determinants in the Polish adult population.

Methods: Data came from the two random samples of the Polish population, screened in 2003–2005 in the WOBASZ health survey (6392 men and 7153 women, aged 20–74 years) and in 2013–2014 in the WOBASZ II health survey (2751 men and 3418 women, aged 20+ years). For the present analysis, the population of WOBASZ II was limited to persons aged 20–74 years. A CHK score (CHKs) was constructed based on questionnaire answers of responders, and the results of physical examination and ranged from –1 (lowest knowledge) to +6 (highest knowledge).

Results: Women had greater CHK than men. In both studies, about 30% of women and 40% of men did not know their blood pressure (BP). About 20% of men and women that declared their BP awareness was not able to classify it correctly to the normal or high category. Most persons that declared body weight awareness could give their body weight to within 2 kg and could correctly classify it as normal or overweight/obesity. The mean CHKs raised in men from 1.74 in WOBASZ to 1.93 in WOBASZ II (in women, respectively, from 2.10 to 2.23). The chance of having CHK greater than mean value of CHKs increased in men by 31% and in women by 27% in WOBASZ II compared to WOBASZ ($OR_{CHK} = 1.31$, $p < 0.0001$ in men; $OR_{CHK} = 1.27$, $p < 0.0001$ in women). Younger, better educated persons and men with coronary artery disease history and persons with familial history of death from myocardial infarction or stroke had greater health knowledge.

Conclusions: Since 2003 Polish adults significantly advanced their knowledge and awareness of cardiovascular risk factors. Gender, age, education level, coronary artery disease history, and family history of cardiovascular disease death are significant determinants of CHK. From 20% to 30% of studied persons who declared their awareness, were shown to be unaware of their own cardiovascular disease risk factors.

Key words: cardiovascular health knowledge, national health survey, Polish population

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INTRODUCTION

Cardiovascular disease (CVD) mortality observed in Poland in the 1980s was one of the highest in Europe [1]. Although since 1992 decreasing trends in CVD mortality rates have been observed, Poland still has double the cardiovascular (CV) mortality rates of other West European countries. Early detection of risk factors and their reduction helps to prevent many diseases, including CVDs. Insufficient knowledge on CVD risk factors, unawareness of the diseases and their complications, or ignorance of prevention methods results in a significant limitation of prevention effectiveness, both primary and secondary. In a study on American adolescents it was found that young people are unaware of cardiac risk factors, and do not perceive themselves to be at risk [2]. So, the evaluation of CV health knowledge (CHK) in the population, and its regional differences, is necessary to prepare rational and effective prevention projects.

Andersson and Leppert [3] found that CHK among men, especially poorly educated and with low socio-economic status, was insufficient. In the world literature there are some data concerning the need for health education, especially in high-risk groups [4]. In a study of the knowledge on stroke risk factors, the observation was made that persons from the highest risk group had the lowest knowledge on stroke symptoms and risk factors [5]. The Health Belief Model (HBM) suggests that a person must feel susceptible to the disease in order to change his or her behaviours [6, 7]. The WOBASZ study (National Multicentre Health Survey) was established to assess the CVD risk factor prevalence and control as well as the lifestyle and CHK in the Polish population 2005 [8].

The aim of the present report was to compare the CHK of adult Poles in the years 2003–2005 and 2013–2014, and to evaluate the CHK determinants in the Polish adult population based on the results of two national surveys: WOBASZ and WOBASZ II.

METHODS

Study design

The methods of the WOBASZ and WOBASZ II studies were published previously [9, 10]. In brief, both studies were carried out on random samples of the Polish population, the WOBASZ in 2003–2005 covering persons aged 20–74 years, and the WOBASZ II in 2013–2014 in a population of persons aged 20+ years. The random selection, made using the National Identity Card Registry of the Ministry of the Interior, was stratified according to administrative unit, type of urbanisation, and gender. In both studies, from each of 16 voivodeships, two small (< 8000 inhabitants), two medium (8000–40,000 inhabitants), and two large (> 40,000 inhabitants) boroughs were randomly selected. Finally, 6392 men and 7153 women (13,545 persons) were examined during WOBASZ and 2751 men and 3418 women (6169 persons) during WOBASZ II. For the present analyses, the population of the WOBASZ II

study was limited to persons aged 20–74 years (5712 persons; 2583 men and 3129 women). Both study protocols covered a questionnaire by face-to-face interview (Q), a physical examination (Q), and laboratory tests. The study was accepted by the Ethics Committee, and all responders signed the informed consent both for questionnaires, physical examination, and blood tests. The examination was performed by trained nurses or interviewers. For quality control of the study the supervisors from coordinating centres performed several controls in the selected samples of interviewers.

Assessment of CHK

The following elements of CHK were analysed based on questionnaire data:

1. The ability to classify own blood pressure as normal or high (BPC Q) (Table 1);
2. The ability to classify own body mass as normal or overweight/obese (BMC Q) (Table 1);
3. The ability to give the body weight accurately to within 2 kg (BWA Q) (Table 1);
4. The knowledge on complications of untreated hypertension (HTC): do you know any complications of untreated hypertension? (open question);
5. The knowledge on CVD prevention methods (PM): what CVD prevention methods do you know? (open question).

For this article hypertension was defined as mean from the second and third blood pressure (BP) measurement $\geq 140/90$ mm Hg or being on antihypertensive treatment. Persons with coronary artery disease (CAD) were classified as those with a history of hospitalisation due to acute coronary syndrome (with myocardial infarction as well) or percutaneous coronary intervention or coronary artery bypass grafting or CAD diagnosis without hospitalisation. Persons with familial history of CVD death were recognised based on the affirmative answer concerning the death of their father or mother due to stroke and/or myocardial infarction. The data on self-assessed health status (very good, good, moderate, or bad) were obtained from the questionnaire. Individual global risk (SCORE risk) was calculated only in the subgroup of persons aged 40–70 years, using the SCORE function for high-risk regions of Europe [11], and analyses were done in two groups: low risk < 5% and high risk $\geq 5\%$. Three categories of education (primary, secondary, and university education) were analysed.

Statistical analysis

All analyses were done separately for men and women. The Wilcoxon nonparametric test was used to evaluate the inter-group differences in CHK in relation to age, health status, education level, etc., and multiple logistic regression was used for assessing the factors associated with the subjects' CHK. P-value < 0.05 was considered statistically significant.

To evaluate each person's knowledge concerning their own CVD risk factors (RF) and its accuracy, answers to the

Table 1. The pattern for coding the knowledge on own cardiovascular diseases' risk factors

Is your blood pressure (BPC _{Q-E})	Blood pressure classification (BPC _{Q-E})		Are you obese or overweight? (BMC _Q)		Body mass classification (BMC _{Q-E})		Give your body weight (BWA _Q)		Body weight awareness (BWA _{Q-E})	
	< 140/90	≥ 140/90	No	Yes	BMI < 25	BMI ≥ 25	Self-reported BW [kg]	Q-E < 2	Q-E ≥ 2	
Normal/low	1	-1	No		1	-1	1	1	-1	
Increased	-1	1	Yes		-1	1	-	-	-	
I don't know	0	0	I don't know		0	0	I don't know	0	0	

E — data from examination; Q — data from questionnaire; BMI — body mass index; BP — blood pressure; BW — body weight

questionnaire were compared with results of physical examination (Q-E), and a score of RF knowledge (RFK) was created as follows: $RFK = BPC_{(Q-E)} + BMC_{(Q-E)} + BWA_{(Q-E)}$. The pattern for coding was described in Table 1. The score ranged from -3 to +3.

In further analyses, a score (CHKs) was created that except RFK covered the knowledge on HTC and PM (each given answer was coded as "1" and "I don't know any" as "0") and was described as the weighted mean of all possible combinations of answers: $CHKs = (7 \times RFK + 6 \times HTC + 9 \times PM) / 22$, where $HTC = \sum \text{answers}_{HTC}$, and $PM = \sum \text{answers}_{PM}$. The coefficients (6, 9, and 7) stand for the number of values that each component could have. The CHKs ranged from -1 to +6.

RESULTS

Taking into account only the RF knowledge, after a 10-year period of time still more men than women were unaware of their BP or body weight (Table 2). From 20% to more than 50% of examined persons either did not know or had inaccurate knowledge on their own CVD risk factors (lack of knowledge and inaccurate knowledge [%^a] together).

Out of three analysed components of RF knowledge, the worst situation was both in BP awareness and in ability of BP classification. Only about 40% of men and 50% of women in both studies knew and could properly classify their BP (accurate knowledge [%^a], Table 2). In both studies more than 65% of respondents were able to classify the body mass as normal or overweight/obese. The awareness of body weight is much greater now than it was 10 years ago; about 70% of examined persons in WOBASZ II (compared to 50–60% in WOBASZ) were able to give their body mass accurately to within 2 kg (accurate knowledge [%^a], Table 2). Nevertheless, 1/5 to 1/3 of studied persons who declared awareness of their own CVD risk factors were in fact inaccurate (inaccurate knowledge [%^b], Table 2).

In both studies, women had greater CHK than men, and in both studies CHK decreased with age and increased with higher education. Greater CHK observed in men with CAD history and men with family history of CVD death in 2003–2005 was not observed 10 years later. However, if we analyse the possessing of CHK greater than the population mean, it was positively associated with familial history of CVD death (Table 3). Moreover, the tendency of persons with worse self-assessed health status as well as persons with high SCORE risk to have lower CHK, observed in WOBASZ, was confirmed also in WOBASZ II (Table 4A, B). Besides, persons examined in the WOBASZ II study had better CHK. The mean CHKs in men raised from 1.74 in WOBASZ to 1.93 in WOBASZ II (in women, respectively, from 2.10 to 2.23) (Table 4A, B).

In general, since 2003 Polish adults significantly advanced their knowledge and awareness of CV risk factors. The chance of having CHK greater than mean value of CHKs increased

Table 2. Knowledge of risk factors

Persons who declared their blood pressure and body weight awareness				Persons unaware of their blood pressure and body weight	
Accurate knowledge*		Inaccurate knowledge*		Lack of knowledge (I do not know)	
WOBASZ	WOBASZ II	WOBASZ	WOBASZ II	WOBASZ	WOBASZ II
% ^a /% ^b (N)	% ^a /% ^b (N)	% ^a /% ^b (N)	% ^a /% ^b (N)	% ^a (N)	% ^a (N)
Men					
Blood pressure classification (BPC)					
43/76 (2969)	44/71 (1180)	13/24 (925)	18/29 (479)	44 (3067)	39 (1051)
Body mass classification (BMC)					
68/70 (4542)	64/66 (1659)	29/30 (1941)	32/34 (846)	3 (210)	4 (109)
Body weight awareness (BWA)					
54/68 (3655)	66/74 (1765)	33/32 (2220)	23/26 (632)	12 (851)	10 (258)
Women					
Blood pressure classification (BPC)					
55/83 (4230)	53/78 (1779)	11/17 (877)	15/22 (493)	34 (2655)	32 (1084)
Body mass classification (BMC)					
78/81 (5861)	75/79 (2404)	18/19 (1361)	21/21 (658)	3 (257)	4 (123)
Body weight awareness (BWA)					
59/70 (4415)	70/66 (2282)	25/30 (1893)	18/34 (598)	16 (1210)	11 (365)

%^a — frequency in whole population; %^b — frequency only in persons who declared their awareness; *Answer to the questionnaire compared to the result of physical examination (accurate — the answer is consistent with the examination; inaccurate — the answer is inconsistent with the examination)

Table 3. Cardiovascular health knowledge — relation to selected socio-demographic factors and familial disease history (combined results of WOBASZ and WOBASZ II)

Health knowledge determinants	Men (n = 6526)			Women (n = 7294)		
	OR ^a	95% CI	p	OR ^a	95% CI	p
Age [years]	0.99	0.98–0.99	< 0.0001	0.99	0.99–0.99	0.0002
Higher education	2.68	2.35–3.08	< 0.0001	2.27	2.03–2.54	< 0.0001
CAD	1.32	1.14–1.53	0.0002	1.02	0.88–1.18	NS
Hypertension	0.90	0.82–0.99	NS	0.73	0.66–0.80	< 0.0001
Familial history of death caused by CAD or stroke	1.14	1.02–1.27	0.0169	1.13	1.03–1.25	0.0148
Survey 2 vs. 1	1.31	1.19–1.44	< 0.0001	1.27	1.16–1.40	< 0.0001

Survey — WOBASZ (1) or WOBASZ II (2); ^aOR (odds ratio) for cardiovascular health knowledge greater than mean value for population (men $\geq 1.79 \pm 1.19$, women $\geq 2.14 \pm 1.22$); CAD — coronary artery disease; CI — confidence interval

in men by 31% and in women by 27% in WOBASZ II compared to WOBASZ (OR_{CHK} = 1.31 in men; p < 0.0001, OR_{CHK} = 1.27 in women; p < 0.0001) (Table 3). Based on logistic regression analysis (combined results of WOBASZ and WOBASZ II), we found that younger, better-educated persons, those with familial history of CVD death, and men with CAD had greater CHK. Suffering from hypertension influenced CHK negatively (Table 3).

DISCUSSION

Knowledge of CVD risk factors is essential for a person to make an informed decision about engaging in or continuing certain behaviours that may increase disease risk, such as smoking, not exercising, or consuming high-fat food [12]. To make effective prevention programmes and to address them better, one should know the “area” of insufficient health knowledge [9]. Although many studies have been

Table 4A. Mean health knowledge score in analysed categories in men (adjusted for age#)

Analysed categories	WOBASZ CHK score 1.74 (6392)	WOBASZ II CHK score 1.93 (2583)	p ₁
Age [years]:			
20–34	1.78 (1821)	2.10 (618)	< 0.0001
35–54	1.81 (2849)	2.00 (948)	< 0.0001
55–74	1.60 (1969)	1.80 (840)	< 0.0001
p ₂	< 0.0001	< 0.0001	
Education#:			
Primary	1.49 (3897)	1.58 (1119)	0.0135
Secondary	1.98 (1949)	2.06 (996)	NS
Higher	2.37 (788)	2.51 (446)	0.0399
p ₂	< 0.0001	< 0.0001	
CAD#:			
Yes	1.92 (709)	1.97 (276)	NS
No	1.72 (5826)	1.92 (2256)	< 0.0001
p ₂	< 0.0001	NS	
Familial history of CAD or stroke death#:			
Yes	1.80 (1415)	1.87 (454)	NS
No	1.72 (5224)	1.94 (2110)	< 0.0001
p ₂	< 0.0391	NS	
Hypertension#:			
Yes	1.72 (2676)	1.79 (1254)	NS
No	1.75 (3959)	2.10 (1300)	< 0.0001
p ₂	NS	< 0.0001	
Self-assessed health#:			
Very good	1.89 (639)	2.03 (332)	NS
Good	1.76(4039)	1.99(1424)	< 0.0001
Moderate	1.64(1619)	1.79 (656)	0.0065
Bad	1.65 (338)	1.48 (94)	NS
p ₂	< 0.0001	< 0.0001	
SCORE risk* #:			
< 5%	1.81 (1985)	2.05 (693)	< 0.0001
≥ 5%	1.70 (1859)	1.85 (747)	0.0038
p ₂	0.0064	< 0.0001	

*Only persons 40–70 years old; p₁ — comparison between surveys; p₂ — comparison between analysed groups in each survey; CAD — coronary artery disease

performed to assess the health knowledge and attitudes in the United States and Western Europe [2–5, 13, 14], there are few studies performed in Central and Eastern Europe. WOBASZ and WOBASZ II were the first studies on such a large random sample of Polish population, which enabled assessment of the prevalence and the change in CHK within a 10-year period of steady decline of CVD mortality. Including into the CHK score not only declaration of risk factor aware-

ness but also its verification in physical examination revealed that the extent to which CHK is insufficient could be seriously underestimated in studies based only on interview. We found that 20–30% of participants declaring knowledge about their own CVD risk factors were in fact incorrect. Nevertheless, the obtained results are consistent with several previous Polish studies (Pol-MONICA, CINDI WHO, NATPOL, 400CITIES) [15–18] in terms of CHK insufficiency and gender differences

Table 4B. Mean health knowledge score in analysed categories in women (adjusted for age[#])

Analysed categories	WOBASZ	WOBASZ II	p ₁
	CHK score 2.10 (7153)	CHK score 2.23 (3129)	
Age [years]:			
20–34	2.21 (2132)	2.38 (663)	0.0006
35–54	2.23 (3143)	2.49 (1154)	< 0.0001
55–74	1.81 (2144)	2.08 (1045)	< 0.0001
p ₂	< 0.0001	< 0.0001	
Education [#] :			
Primary	1.69 (3456)	1.64 (1116)	NS
Secondary	2.36 (2851)	2.45 (1313)	0.0476
Higher	2.70 (1107)	2.77 (688)	NS
p ₂	< 0.0001	< 0.0001	
CAD [#] :			
Yes	1.89 (733)	1.86 (278)	NS
No	2.13 (6570)	2.28 (2797)	< 0.0001
p ₂	< 0.0001	< 0.0001	
Familial history of CAD or stroke death [#] :			
Yes	2.10 (1700)	2.15 (647)	NS
No	2.10 (5719)	2.25 (2473)	< 0.0001
p ₂	NS	0.0244	
Hypertension [#] :			
Yes	2.22 (2400)	1.95 (1304)	NS
No	1.86 (5015)	2.44 (1807)	< 0.0001
p ₂	< 0.0001	< 0.0001	
Self-assessed health [#] :			
Very good	2.31 (577)	2.03 (287)	0.0008
Good	2.20 (4407)	1.99(1732)	0.0016
Moderate	1.89 (2010)	1.79 (900)	0.0141
Bad	1.77 (421)	1.48 (146)	NS
p ₂	< 0.0001	< 0.0001	
SCORE risk* [#] :			
< 5%	2.12 (3234)	2.40 (1405)	< 0.0001
≥ 5%	1.91 (892)	2.05 (352)	0.0396
p ₂	< 0.0001	0.0001	

*Only persons 40–70 years old; p₁ — comparison between surveys; p₂ — comparison between analysed groups in each survey; CAD — coronary artery disease

The strong relationship between socio-economic status, education level, and knowledge on CVD risk factors is known and was proven in many foreign studies [13, 14, 19]. The Swedish study showed low knowledge level on CVD risk factors among 50-year-old men and among lower educated and low socio-economic status persons [3]. A high correlation between health knowledge and higher education was found in the study of 1367 students, aged 12–18 years, and 562 adults aged 20–60 years, using the Iowa Cardiovascular Health Knowledge Test (ICVHT) [20]. Education proved to be the strongest predictor of CVD knowledge in an American

population of 27,716 — a nationally representative sample of the United States population of Whites, Blacks, and Hispanics [14]. Also in a cross-sectional survey in Italy targeting a group of 830 women, aged 21–67 years, their knowledge was related to socio-economic status, education level, and self-perceived health [21]. The positive effect of education on their knowledge is consistent with previous research [22]. We obtained similar results because both primary educated men and women had CHK twice as low as higher-educated persons.

In the world literature, there are reports on the desperate need for health education, especially for high-risk groups [4],

which is what we also proved in our study. Both men and women with high SCORE risk ($\geq 5\%$) had significantly lower CHK than those with global risk $< 5\%$. The adjustment for age, which influences both the health knowledge and the affiliation to a high-risk group, did not invert this trend. In an American study evaluating CHK from childhood to maturity using ICVHT, it transpired that persons with higher risk of heart disease did not have greater knowledge on atherosclerosis or CVD risk factors [19]. Similar results were found in a Dutch study of 4117 adults whose inherited high cholesterol level awareness was not associated with their own CVD status [23].

Gans et al. [4], in their analysis of results of the Pawtucket Heart Health Programme (PHHP), one of the three largest American projects concerning CVD prevention on a community level, found that health knowledge on risk factors or prevention methods was better among higher educated persons, women, and younger people. Similar results were obtained in our study, as well as in other studies [3, 4, 16].

Of note was a positive tendency to have greater CHK by persons with familial history of CVD death, since such persons are more prone to develop a CVD. In our study, in such persons the chance of having CHK greater than the population mean was significantly higher compared to persons without familial history. There are some prevention programmes for families of persons with CAD or high CV risk (EUROACTION). Family history of premature CVD was one of the significant predictors of awareness of inherited high cholesterol (a weak association) in the study of 4117 Dutch adults interviewed by phone [23].

In the PHHP study, which consisted of six independent cross-sectional studies conducted in 1981–1993, it was found that the level of health knowledge reached a plateau in 1988, and after 1988 it became worse [4]. It was probably related to cuts in government funds on education programmes. During PHHP intervention programmes, the risk of CVD death decreased by 16% in the intervention group in comparison to the control group, and two years after ending this programme the difference was only 8% and was not statistically significant. It confirmed the need for prevention programmes and the need to monitor health status and knowledge for better effectiveness of prevention.

On the basis of the results of previously conducted Polish studies, several population-wide intervention programmes and new health policy activities and strategies have been proposed [24]. The data from WOBASZ clearly showed that further efforts are needed to influence more efficiently CHK. In 2003–2008 several large-scale projects were implemented in the frame of the National Cardiovascular Disease Prevention and Treatment Programme POLKARD: “Mind your heart” POLKARD Media Education Programme, Polish Project of 400 Cities or SMS Programme addressed to children and youths. The preliminary results are encouraging.

CONCLUSIONS

In summary, our results indicate that since 2003 Polish adults significantly advanced their knowledge and awareness of CV risk factors. In general, women, better educated persons, men with CAD, and persons with familial history of CVD death had better health knowledge. On the other hand, persons with worse health status, both self-assessed and evaluated by SCORE, were characterised by worse health knowledge. Of note, 20% to 30% of studied persons who declared their awareness transpired to be unaware of their own CVD risk factors. The prevention and intervention programmes should be targeted as necessary, particularly towards men, worse educated persons, and persons with worse health status.

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Wiedza o zdrowiu populacji polskiej. Porównanie dwóch wieloośrodkowych badań przekrojowych: WOBASZ i WOBASZ II

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Streszczenie

Wstęp i cel: Celem pracy było porównanie wiedzy o zdrowiu dorosłych Polaków w latach 2003–2005 i 2013–2014 oraz ocena czynników determinujących jakość wiedzy o zdrowiu.

Metody: Dane pochodzą z dwóch prób losowych populacji polskiej, zbadanych w latach 2003–2005 w ramach badania WOBASZ (6392 mężczyzn i 7153 kobiet w wieku 20–74 lata) oraz w latach 2013–2014 w ramach badania WOBASZ II (2751 mężczyzn i 3418 kobiet w wieku ≥ 20 lat). Dla potrzeb analiz populacja badania WOBASZ II została ograniczona do osób w wieku 20–74 lat. Wskaźnik wiedzy o zdrowiu (WZs), skonstruowany na podstawie odpowiedzi na pytania kwestionariusza oraz wyników badania przedmiotowego, mógł osiągać wartości od -1 (brak wiedzy) do $+6$ (najlepsza wiedza).

Wyniki: Kobiety miały większą wiedzę o zdrowiu niż mężczyźni. W obydwu badaniach ok. 30% kobiet i 40% mężczyzn nie znało wartości swojego ciśnienia tętniczego (BP). Około 20% mężczyzn i kobiet, którzy deklarowali znajomość BP, nie potrafiło prawidłowo zaklasyfikować go do kategorii 'norma' lub 'podwyższone'. Większość osób, które deklarowały znajomość swojej masy ciała, umiała podać ją z dokładnością do 2 kg oraz prawidłowo zaklasyfikować do kategorii 'norma' i 'nadwaga/otyłość'. Średni WZs wzrósł z 1,74 w badaniu WOBASZ do 1,93 w badaniu WOBASZ II (u kobiet odpowiednio z 2,10 do 2,23). Szansa posiadania wiedzy o zdrowiu większej niż średni WZs wzrosła u mężczyzn o 31%, a u kobiet o 27% w badaniu WOBASZ II w porównaniu z badaniem WOBASZ ($OR_{WZ} = 1,31$; $p < 0,0001$ u mężczyzn; $OR_{WZ} = 1,27$; $p < 0,0001$ u kobiet). Osoby młodsze, lepiej wykształcone, mężczyźni z chorobą wieńcową oraz osoby z dodatnim wywiadem rodzinnym w kierunku zgonu z powodu zawału serca lub udaru mózgu charakteryzowały się lepszą wiedzą o zdrowiu.

Wnioski: Od 2003 r. Polacy istotnie poprawili swoją wiedzę o zdrowiu. Płeć, wiek, poziom wykształcenia, choroba wieńcowa i dodatni wywiad rodzinny w kierunku zgonu z powodu chorób układu sercowo-naczyniowych okazały się istotnymi determinantami wiedzy o zdrowiu. Od 20% do 30% badanych osób, które zadeklarowały znajomość własnych czynników ryzyka, okazało się jednak ich nie znać.

Słowa kluczowe: wiedza o zdrowiu, badanie przekrojowe, populacja polska

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