GERONTOLOGIA POLSKA 2017; 25; 99-105 ARTYKUŁORYGINALNY/ORIGINALPAPER
Zgłoszono 15.01.2017, zaakceptowano 30.04.2017

The impact analysis of the educational program on changing of eating habits of people over the age of 65 with diagnosed coronary heart disease

Analiza wpływu przeprowadzonego programu edukacyjnego na zmianę zachowań żywieniowych osób po 65 roku życia z rozpoznaną chorobą niedokrwienną serca

Beata Dziedzic, Jacek Imiela, Zofia Sienkiewicz, Maria Strzemieczna

Zakład Pielęgniarstwa Społecznego, Warszawski Uniwersytet Medyczny

Abstract

Introduction. *In recent years, the average life expectancy is increasing. Cardiovascular disease, including coronary heart disease, is the leading cause of death especially among older communities. Proper healthy habits associated with appropriate nutrition, implemented in each stage of life, improve health conditions and prevent further progression of disease.* ***Aim.*** *The aim of the study was to assess the impact of an educational program on the change of eating behavior in a group of elderly people treated for ischemic heart disease.* ***Material and methods.*** *The study included 200 patients treated in a specialized cardiological clinic. The subjects were divided into two groups (educated group - A and not educated, control group - B). The educational program was completed by the participants of group A. After six months there was an inspection of the results of the training program. One group was specified as group A1 (educated group after 6 months) and B1 (not educated after 6 months). The study was performed with a self-prepared questionnaire containing questions concerning the frequency of consumption of selected food products.* ***Results.*** *The analysis of the frequency of consumption of selected food products in 6 months after the training program in groups A to A 1 increased consumption of fish 3-2 times a week (from 12% to 59.1%); daily consumption of fruits and vegetables (from 42% to 61.3%), daily consumption of skim dairy products (from 11% to 22.6%) and the daily consumption of cereal products (from 30% to 44.1%).* ***Conclusions.*** *The survey observed a significant improvement in eating habits after the implementation of the training program. The subjects require further systematic education in order to improve their health. (Gerontol Pol 2017; 25; 99-105)*

Key words: *health habits, education, elderly, coronary heart disease*

Streszczenie

Wstęp. *W ostatnich latach życie ludzkie wydłużyło się. Choroby układu krążenia w tym choroba niedokrwienna serca są nadal najczęstszą przyczyną zgonów szczególnie wśród starszej społeczności. Właściwe zachowania zdrowotne związane z odpowiednim odżywianiem, wdrożone w każdym etapie życia sprzyjają zdrowiu oraz zapobiegają dalszemu postępowi choroby.* ***Cel pracy.*** *Celem badań była ocena wpływu zrealizowanego programu edukacyjnego na zmianę zachowań żywieniowych w grupie osób starszych leczonych z powodu choroby niedokrwiennej serca.* ***Materiał i metody.*** *Badaniem objęto 200 pacjentów leczonych w specjalistycznej poradni kardiologicznej, następnie osoby badane podzielono na dwie grupy (grupa edukowana - A oraz grupa nieedukowana, kontrolna – B). Wśród uczestników grupy A zrealizowano program edukacyjny. Po upływie sześciu miesięcy przeprowadzono kontrolę wyniku realizowanego programu szkoleniowego i wyszczególniono grupę A1 (edukowana po 6 miesiącach) oraz B1 (nieedukowana po 6 miesiącach). Badanie przeprowadzono przy użyciu autorskiego kwestionariusza ankiety zawierającego pytania z zakresu częstości spożywania wybranych produktów żywnościowych.* ***Wyniki.*** *Analizując częstość spożycia wybranych produktów żywnościowych po realizacji programu szkoleniowego w grupach A do A 1 wzrosło spożycie ryb 3-2 razy w tygodniu (z 12% do 59,1%), codzienne spożycie warzyw i owoców (z 42% do 61,3%), codzienna konsumpcja chudego nabiału (z 11% do 22,6%) oraz codzienna podaż produktów zbożowych (z 30% do 44,1%).* ***Wnioski.*** *W przeprowadzonym badaniu zaobserwowano znaczną poprawę zachowań żywieniowych po wdrożeniu programu szkoleniowego. Badani wymagają dalszej systematycznej edukacji w celu poprawy zdrowia. (Gerontol Pol 2017; 25; 99-105)*

Słowa kluczowe: *zachowania zdrowotne, edukacja, osoby starsze, choroba niedokrwienna serca*

Adres do korespondencji: Beata Dziedzic; Zakład Pielęgniarstwa Społecznego, WUM; ul. Erazma Ciołka 27; 01-445 Warszawa ☎ (+48 22) 877 35 97 ;

Introduction

The dominant number of deaths caused by cardiovascular disease (CVD) touch the Poles in the elderly. In 2013 on 387 000 deaths caused by CVD, 72% were persons aged 65 and above, for compared to 1990 when this percentage was 65%. The reason of this difference might be, among other things, an increased participation of older people in the general population. Despite the decline in mortality caused by cardio - vascular factors, in 2012 in the group of people over the age of 65 they caused 54% of deaths, including 13% caused by ischemic heart disease [1]. In the last years of the twentieth century in developed countries, including Poland, human life got significantly longer [2]. An increasing number of people in the old age require the implementation of effective educational programs [3]. Health habits play an important role as factors affecting health and the aging process. The issue of health behaviors is especially important in the face of the growing proportion of older people in the general population [4]. In the nutrition of older people eating habits are important, which are not always appropriate. Properly balanced, low-calorie diet, has a positive effect on the aging process [5,6]. Over the years not only is the metabolism changing, but also the bioavailability of foods, as well as the risk of developing cardiovascular disease is increasing. So the diet should be rich in fish products, lean meat, legumes and vegetable oils. An essential part of the diet are cereals with the whole grain, vegetables and fruits, delivered in several portions during the day. Low-fat dairy products containing calcium and protein should be consumed in 2-3 portions daily. Drinking no less than one and a half a liter of fluid a day, should not be forgotten [7,8].

Aim

The aim of the study was to assess the impact of the educational program on changing of eating habits of elderly patients with coronary heart disease diagnosed.

Material and methods

The study was conducted in the Specialized Cardiology Clinic in Warsaw. 200 randomly selected patients receiving treatment in the clinic took part in the study. Initially the study design was presented and explained to participants. Some patients were willing to participate in the educational training. The others, who were not interested in participating in educational activities, constituted the control group. As a result of this division, before the beginning of trainings, two groups were created: educated (group A) and not educated (group B). Initially each group consisted of 100 patients. Finally only 93 patients attended the educational program. This group, after the training program, designated as group A1. In the control group 97 patients remained. This group was labeled as a group B1. The study was performed with a self-prepared questionnaire. The quality of nutrition was rated on the basis of information about the frequency of consumption of selected products, given by those surveyed. The list of products was based on the recommendation of the European Society of Cardiology (ESC) for people with coronary artery disease. The study was approved by the Bioethics Committee of the Institute of Cardiology in Warsaw (number of approval IK--NP.-0021-34/1433/14). Calculations were performed in IBM SPSS 23.0. To assess the relationship between nominal variables and the differences between the two groups in the distributions of the response rate, contingency tables were made and test Chi¸ were used. For tables 2x2 Fisher's exact test was taken. To examine the relationship between qualitative variables factor V Cramer was used . The analyzed parameters were described by quantity and the percentage. Borderline level of statistical significance was $p < 0.05$.

Results

The average age of participants of both groups was similar (group A - 68.98 years) (group B - 69.92 years). The largest group was in marriage (78.5%). In both groups majority resided in urban areas (95% and 84%). Proportion of education levels (higher, secondary and vocational) in group A was 29%, 44%, 27%, in group B - respectively 39%, 39%, 22%. Group A consisted of 47% women and 53% men, while in group B women accounted for 43% and men for 57%.

In the first stage of the study the consumption of selected food products, before the implementation of the training program, was analyzed. Majority of those surveyed declared consumption of oily fish once a week, in both groups (in group A 62%, in group B 53%). Daily consumption of fruits and vegetables in both groups was declared by 42% of respondents. Low-fat dairy products was daily dietary components for 11% of patients in group A and 12% of group B. Grain products were part of daily meal for 30% of patients in group A and 32% in group B. Grains and legumes have proved to be the least popular product, the largest group of 58% (group A) and 54% (group B) consumed this kind of products less than 1 time per week. Most often respondents declared consumption of vegetable oils 3-2 times a week, in both

groups A and B (respectively 35% and 44%). In addition 48% and 44% of patients in both groups declared putting additional salt into consumed products. Removing of unwanted fat was a habit for 41% and 46% of the patients in groups A and B.

After the educational program, in the group A1 in comparison with group A, the consumption of oily fish 3-2 times a week was significantly improved (from 12% to 59.1%), while the percentage of people not eating fish at all or less than once a week reached zero level. Compa-

Table I. Frequency of consumption of selected food products in groups A, A1, B, B1
Tabela I. Częstość spożycia wybranych produktów spożywczych w grupach A, A1, B, B1

Product	Frequency	Group A		Group A1		Group B		Group B1	
		n	%	n	%	n	%	n	%
Oily fish	I do not consume	0	0.0	0	0.0	1	1.0	1	1.0
	Less than once a week	26	26.0	0	0.0	32	32.0	31	32.0
	Once a week	62	62.0	37	39.8	53	53.0	52	53.6
	3-2 times a week	12	12.0	55	59.1	11	11.0	10	10.3
	6-4 times a week	0	0.0	1	1.1	1	1.0	1	1
	Every day	0	0.0	0	2.1	2	2.0	2	1.1
Total		100	100.0	93	100.0	100	100.0	97	100.0
Fruits and vegetables	I do not consume	0	0.0	0	0.0	0	0	0	0.0
	Less than once a week	0	0.0	0	0.0	2	2.0	2	2.1
	Once a week	5	5.0	1	1.1	1	1.0	1	1.0
	3-2 times a week	25	25.0	7	7.5	31	31.0	28	28.9
	6-4 times a week	28	28.0	28	30.1	24	24.0	23	23.7
	Every day	42	42.0	57	61.3	42	42.0	43	44.3
Total		100	100.0	93	100.0	100	100.0	97	100.0
Lean meat and poultry cured meats	I do not consume	3	3.0	0	0.0	5	5.0	5	5.2
	Less than once a week	11	11.0	7	7.5	12	12.0	12	12.4
	Once a week	51	51.0	42	45.2	51	51.0	49	50.5
	3-2 times a week	22	22.0	29	31.2	20	20.0	19	19.6
	6-4 times a week	13	13.0	15	16.1	12	12.0	12	12.4
	Every day	0	0.0	0	0.0	0	0.0	0	0.0
Low fat dairy	I do not consume	4	4.0	3	3.2	5	5.0	5	5.2
	Less than once a week	9	9.0	0	0.0	10	10.0	12	12.4
	Once a week	24	24.0	7	7.5	25	25.0	21	21.6
	3-2 times a week	42	42.0	35	37.6	35	35.0	36	37.1
	6-4 times a week	10	10.0	27	29.0	13	13.0	13	13.4
	Every day	11	11.0	21	22.6	12	12.0	10	10.3
Total		100	100.0	93	100.0	100	100.0	97	100.0
Whole grain	I do not consume	6	6.0	2	2.2	4	4.0	3	3.1
	Less than once a week	3	3.0	0	0.0	14	14.0	14	14.4
	Once a week	14	14.0	2	2.2	6	6.0	6	6.2
	3-2 times a week	27	27.0	18	19.4	28	28.0	25	25.8
	6-4 times a week	20	20.0	30	32.3	16	16.0	18	18.6
	Every day	30	30.0	41	44.1	32	32.0	31	32.0
Total		100	100.0	93	100.0	100	100.0	97	100.0
Grains and legumes	I do not consume	22	22.0	0	0.0	17	17.0	15	15.5
	Less than once a week	58	58.0	0	0.0	54	54.0	52	53.6
	Once a week	12	12.0	44	47.3	16	16.0	18	18.6
	3-2 times a week	8	8.0	49	52.7	11	11.0	10	10.3
	6-4 times a week	0	0.0	0	0.0	2	2.0	2	2.1
	Every day	0	0.0	0	0.0	0	0.0	0	0.0
Total		100	100.0	93	100.0	100	100.0	97	100.0
Vegetable oils	I do not consume	0	0.0	0	0.0	4	4.0	4	4.1
	Less than once a week	0	0.0	0	0.0	5	5.0	5	5.2
	Once a week	15	15.0	8	8.6	13	13.0	13	13.4
	3-2 times a week	35	35.0	30	32.3	44	44.0	38	35.8
	6-4 times a week	17	17.0	22	23.7	14	14.0	14	14.4
	Every day	33	33.0	33	35.5	20	20.0	23	23.7
Total		100	100.0	93	100.0	100	100.0	97	100.0

rison of groups A to A1 shows, that less respondents declared consumption of fruits and vegetables 3-2 times per week (from 25% to 7.5%) in favor of a significant increase in declarations of eating fruits and vegetables every day (from 42% to 61.3%) or 6-4 times per week (from 28% to 30.1%). During the first study (group A), declared consumption of low fat dairy every day rated 11%, while 6-4 times a week rated 10%. Both of this values increased after the training - in group A1 rated respectively 22.6% and 29%. The grains became part of the everyday diet for 44.1% of the patients in group A1 (previously 30%) and consumed 6-4 times per week for 32.3% of the group (previously 20%). The participants of training have learned how important the presence of grains and legumes is in the diet. The results of the comparative analyzes of groups A and A1 showed that number of persons declaring not consuming these products or consuming them less frequently than once a week achieved zero values (from respectively 22% and 58%). At the Same time the consumption of grains and legumes 1 time per week and 3-2 times week increased (respectively 47.3% and 52.7%). In the group A, vegetable oils were consumed 6-4 times a

Table II. Adding extra salt and disposing of visible fat from the meat in groups A, A1, B, B1
Tabela II. Dodawanie soli i pozbywanie się widocznego tłuszczu z mięs w grupach A, A1, B, B1

Adding extra salt	Group A		Group A1		Group B		Group B1	
	n	%	n	%	n	%	n	%
No	52	52.0	79	84.9	56	56.0	53	54.6
Yes	48	48.0	14	15.1	44	44.0	44	45.4
Total	100	100.0	93	100.0	100	100.0	97	100.0
Disposing of visible fat from the meat and cold cuts								
No	15	15.0	9	9.7	15	15.0	14	14.4
Sometimes	44	44.0	5	5.4	39	39.0	36	37.1
Yes	41	41.0	79	84.9	46	46.0	47	48.5
Total	100	100.0	93	100.0	100	100.0	97	100.0

Table III. Comparative characteristic consumption of certain products in groups A, A1, B, B1
Tabela III. Charakterystyka porównawcza spożycia niektórych produktów w grupach A, A1, B, B1

Parameter	Compared groups	Ch2	df	φ/V	p
Consumption of oily fishes	A Vs A1	60.74	3	0.56	0.000
	A1 Vs B1	67.63	5	0.60	0.000
	B Vs B1	0.03	5	0.01	1.000
Consumption of fruits and vegetables (200g)	A Vs A1	14.83	3	0.28	0.002
	A1 Vs B1	16.97	4	0.30	0.002
	B Vs B1	0.14	4	0.03	0.998
Consumption of lean meat and poultry cured meats	A Vs A1	5.62	4	0.17	0.230
	A1 Vs B1	9.19	4	0.22	0.057
	B Vs B1	0.02	4	0.01	1.000
Consumption of low fat dairy	A Vs A1	29.82	5	0.40	0.000
	A1 Vs B1	28.25	5	0.39	0.000
	B Vs B1	0.68	5	0.06	0.984
Consumption of whole grain products	A Vs A1	19.28	5	0.32	0.002
	A1 Vs B1	21.65	5	0.34	0.001
	B Vs B1	0.40	5	0.05	0.995
Consumption of grains and legumes	A Vs A1	127.69	3	0.81	0.000
	A1 Vs B1	105.65	4	0.75	0.000
	B Vs B1	0.28	4	0.04	0.991
Consumption of vegetable oils	A Vs A1	2.91	3	0.12	0.406
	A1 Vs B1	14.62	5	0.28	0.012
	B Vs B1	0.60	5	0.06	0.988
Adding extra salt to the meals	A Vs A1	23.99	1	0.35	0.001
	A1 Vs B1	20.56	1	0.33	0.001
	B Vs B1	0.04	1	0.01	0.848
Disposing of visible fat from the meat and cold cuts and skin from poultry	A Vs A1	44.38	2	0.48	0.000
	A1 Vs B1	32.58	2	0.41	0.000
	B Vs B1	0.12	2	0.02	0.942

week by 17% of respondents, every day by 33%, in the group A1 this values rose to 23.7% and 35.5%. Detailed results are presented of the Table I.

After the training the number of people who declared putting extra salt to the meals also had been strongly reduced - from 48% in group A to 15.1% in group A1. Before the training program, only 41% of people from group A was disposing of the visible fat from meats and cold cuts. After the training this number increased to 84.9% (group A1).

Also comparison of group A1 (educated group) and B1 (control group) showed similar benefits of the training program and positive change in eating habits. Detailed results are presented in Table II.

The analysis of the survey conducted before the implementation of the training program, showed statistically significant differences between group A and B in the consumption of wholegrain cereal products and vegetable oils. Analysis of other variables showed no statistical significance. Re-analysis of the consumption of selected food products after the training program showed statistically significant differences between groups A and A1 as well as between A1 and B1. There was no statistical significance differences between group B and B1.

Discussion

Coronary heart disease, which in Poland is one of the most common causes of hospitalization, mortality and inability to work, requires the implementation of remedial programs [9] which should include adequate knowledge about the elimination of risk factors. Effects of reducing of risk factors are comparable to pharmacological treatment and surgery. Global research, based on IMPACT model, conducted in Europe, America, Canada, China and New Zealand estimate that the reduction in mortality as a result of the elimination of risk factors is 50 - 75%. In the United States in 20 years (1980 to 2000) the decrease of mortality due to the reduction of risk factors was estimated at 44% in Canada from 1994 to 2005 - 48%, in UK in the period 1981-2000 - 50%, in Poland in the years 1991 - 2005 around 54% [10].

Analyzing the results of the study in which several Spanish centers participated and in which 7447 people aged 50 - 80 years took part, after introduction of one of the mediterranean diets, enriched with nuts consumption, the risk of death because of cardiovascular causes was reduced by 30% [11].

In the described survey fishes, which are an important part of the Mediterranean diet, were consumed 3-2 times a week by only 12% of respondents in the group A(before the training), and 11% of people in the group B (control group). After completing the education program, the percentage of people declaring consumption of fish 3-2 times a week in the group educated A1, increased significantly up to 59.1%. In the uneducated, control group was still low (10.3%).

The knowledge of the connection between dyslipidemia and poor nutrition seems to be widely known. Unfortunately despite this, even in high risk groups there is problem of incorrect behaviors regarding nutrition.

This was confirmed in a study conducted by Makarewicz et al. In the study eating habits of 70 patients with heart failure and healthy people were compared. In the group with diagnosed sickness,he noticed a high consumption of saturated fatty acids and low of dietary fiber [12].

Also as described in the article study, numerous incorrect habits related to nutrition had been shown. It confirms the results of other analyzes.

This is especially important due to the fact that the study concerned patients whose disease had already occurred.

Another example is a study conducted by Suliga in which 166 patients aged 60 years and above took part. In this study many unhealthy food habits were noticed. 57.2% of people were adding extra salt to meals after preparation. 83.1% of respondents consumeted fishes once a week or less often. 67.5% ate meat and cold cuts every day, while vebetables were not part of everyday diet for 37.4% and fruits for 38%of responders. Wholemeal bread was not included in daily meals by 74.4%, milk and dairy products by 39.2% of participants of the research. 41% of respondents declared consuming grains and legumes less than once a week or not at all [13].

The results of the mentioned study were similar to the ones presented in this article, although in this last study an improvement after the training was noticed.

The results of the analysis by Szczerbińska et al. in the group of elderly people are not optimistic. Similarly like in the study present in this article, fruits were consumed everyday only by 46.3% of respondents, legumes only by 47.2%, vegetable oils by 52%, milk and dairy products by 56.6%. Consumption of fish 1-2 times a week declared 38.9% of respondents, while 30.6% of surveyed consumed it only 1-2 times a month. 17.6% of people almost did not eat fish at all [14].

Also other authors emphasize the importance of the type of consumed products and their impact on cardiovascular - vascular related morbidity and mortality. A large observational study, in editions of the programs Pol - MONICA and WAW- KARD, assessing the state of nutrition of the population of Warsaw in 28 years (1984-2012), proved the decrease of the risk of cardiovascular

disease associated with a change of diet - a reduction of consumption of saturated fat ,replaced by plants products. The reduction in the risk of mortality by 20% in men and 35% in women was noticed [15].

The British study attempted to assess the influence of the diet recommended by the WHO (Mediterranean style) addressed to the elderly and its role in cardio - vascular diseases in comparison with traditional diet (so-called healthy diet). The study included 3338 men aged 60 - 79 years. The lowest risk of mortality was found in the group on a diet composed according to the WHO recommendations for this age group [16].

The analysis of 10 prospective studies in Europe and the United States (281 874 men and women) showed that adherence to dietary recommendations identified by WHO in patients aged 60 years and above, resulted in a reduction in mortality associated with cardiovascular diseases, especially in Southern Europe [17].

Conclusions

1. A lot of incorrect health habits, associated with poor nutrition, was noticed before the implementation of the education program.
2. After the training program, eating habits of participants had improved, especially the frequency of consumption of recommended products had increased.
3. It is recommended to continue education on healthy lifestyle for perpetuation of the achieved results. It is especially important due to the growth of the number of older people, in whom the risk of further development of the disease increase with age.

Conflict of interest
None

References

1. www.stat.gov.pl [acessed: 08.06.2016].
2. Christensen K, Doblhammer G, Rau R, et al. Ageing populations: the challenges ahead. Lancet. 2009;374:1196-208.
3. Marcinkiewicz A. The University of the Third Age as an institution counteracting marginalization of older people. J Edu Cult Soc. 2011;2:38-44.
4. Sygit-Kowalikowska E. Zachowania zdrowotne osób w wieku późnej dorosłości. Szczecin: Roczniki Pomorskiej Akademii Medycznej. 2013;59(1):103-13.
5. Sajór I, Jarosz M. Konsekwencje nieprawidłowego żywienia i małej aktywności fizycznej u osób w wieku starszym. In: Jarosz M. Żywienie osób w wieku starszym. Warszawa: Wydawnictwo Lekarskie PZWL; 2008. str. 52-60.
6. Jarosz M, Rychlik E. Przyczyny niedoboru makro i mikroskładników u osób w wieku starszym. In: Jarosz M (red.). Żywienie osób w starszym wieku. Warszawa: Wydawnictwo Lekarskie PZWL; 2008. str. 40-51.
7. Wolnicka K, Rychlik E. Zalecenia żywieniowe dla osób w wieku starszym. W: Jarosz M. (red.). Żywienie osób w wieku starszym. Warszawa: Wydawnictwo Lekarskie PZWL; 2011. str. 61-69.
8. Wolnicka K, Rychlik E. Praktyczne wskazówki do realizacji zaleceń żywieniowych dla osób w wieku starszym. W: Jarosz M. (red.). Żywienie osób w starszym wieku. Warszawa: Wydawnictwo Lekarskie PZWL; 2011. str. 70-88.
9. Pająk A, Szafraniec K, Janion M, et al. Wpływ ogólnopolskiego Programu Profilaktyki Chorób Układu Krążenia na jakość pierwotnej prewencji chorób układu sercowo-naczyniowego w praktyce klinicznej. Kardiol Pol. 2010;68(12):1332-41.
10. Kłosiewicz-Latoszek L. Znaczenie prewencji w redukcji zgonów wieńcowych. Kardiol Pol. 2010;68 (12):1342-3.
11. Estruch R, Ros E, Salas-Salvadó J. Primary Prevention of Cardiovascular Disease with a Mediterranean Diet. N Engl J Med. 2013;368:1279-90.
12. Makarewicz-Wujec M, Kozłowska-Wojciechowska M, Sygnowska E, et al. Czy niewydolność serca determinuje sposób żywienia pacjentów? Kardiol Pol. 2014;72(1):56-63.
13. Suliga E. Zachowania zdrowotne związane z żywieniem osób dorosłych i starszych. Hygeia Public Health. 2010;45(1):44-8.

14. Szczerbińska K, Piorecka B, Malinowska-Cieślik M. Fazy gotowości do zmiany zachowań i ich uwarunkowania a zachowania w sferze aktywności fizycznej i żywienia wśród starszych pacjentów objętych w Krakowie opieką pielęgniarek środowiskowo-rodzinnych. Implikacje dla promocji zdrowia. Zdrowie Publiczne i Zarządzanie 2011;IX(1):60-75.
15. Waśkiewicz A, Piotrowski W, Szostak-Węgierek D, et al. Związek między 28-letnimi trendami wybranych czynników żywieniowych a 10-letnim globalnym ryzykiem zgonu z powodu chorób sercowo- -naczyniowych w dorosłej populacji Warszawy. Kardiol Pol. 2015;73(8):650-5.
16. Atkins J.L, Whincup P.H, Morris RW, et al. High diet quality is associated with a lower risk of cardiovascular disease and all-cause mortality in older men. J Nutr. 2014;144(5):673-80.
17. Jankovic N, Geelen A, Streppel MT. WHO guidelines for a healthy diet and mortality from cardiovascular disease in European and American elderly: the CHANCES project. Am J Clin Nutr. 2015;102 (4):745-56.