Agata Reczek[1],A-D,F, Justyna Wojdyła-Piekarz[2],B,E-F, Ewa Kawalec-Kajstura[1],B,E-F

ASSESSMENT OF HEALTH BEHAVIOURS OF PATIENTS AFTER IMPLANTATION OF CARDIOVERTER-DEFIBRILLATOR

Ocena zachowań zdrowotnych pacjentów po implantacji kardiowertera-defibrylatora

[1]Zakład Pielęgniarstwa Internistycznego i Środowiskowego, Instytut Pielęgniarstwa i Położnictwa, Wydział Nauk o Zdrowiu, Uniwersytet Jagielloński Collegium Medicum, Polska
[2]Oddział Kliniczny Elektrokardiologii, Krakowski Szpital Specjalistyczny im. Jana Pawła II, Polska

A – Koncepcja i projekt badania, B – Gromadzenie i/lub zestawianie danych, C – Analiza i interpretacja danych, D – Napisanie artykułu, E – Krytyczne zrecenzowanie artykułu, F – Zatwierdzenie ostatecznej wersji artykułu

Agata Reczek – ID 0000-0002-6895-6653
Ewa Kawalec-Kajstura – ID 0000-0002-8754-147X

Abstract (in Polish):
Cel pracy
Celem pracy była ocena zachowań zdrowotnych w grupie pacjentów ze schorzeniami kardiologicznymi po implantacji kardiowertera-defibrylatora, jak również ocena związku między zachowaniami zdrowotnymi, a wybranymi zmiennymi socjodemograficznymi i klinicznymi. Zachowania zdrowotne są istotnym elementem codziennej aktywności życiowej człowieka, jeśli są pozytywne służą wspieraniu zdrowia. Dlatego też w tym aspekcie istotnego znaczenia nabierają takie zachowania zdrowotne jak: prawidłowe nawyki żywieniowe, zachowania profilaktyczne, praktyki zdrowotne i pozytywne nastawienia psychiczne.

Agata Reczek, Justyna Wojdyła-Piekarz, Ewa Kawalec-Kajstura

Materiał i metody

W badaniu uczestniczyło 176 pacjentów z implantowanym kardiowerterem-defibrylatorem. Średni wiek badanych wynosił 62,36 lat (SD=15,41). Zdecydowaną większość stanowili mężczyźni (78,41%). Do badań użyto autorski kwestionariusz zawierający podstawowe dane socjo-demograficzne oraz Inwentarz Zachowań Zdrowotnych (IZZ) wg Z. Juczyńskiego.WynikiZdecydowana większość badanych pacjentów (71,02%) prezentowała wysokie nasilenie zachowań zdrowotnych. Tylko niewielki odsetek badanych (4,55%) miał niskie nasilenie zachowań zdrowotnych. Najbardziej nasilone zachowania zdrowotne dotyczyły praktyk zdrowotnych (średnia 4,09; SD=0,63). Natomiast najniżej ocenione zostały prawidłowe nawyki żywieniowe (średnia 3,62; SD=0,77). Zmienne socjo-demograficzne takie jak: wiek, płeć, stan cywilny, wykształcenie, aktywność zawodowa, mieszkanie z rodziną, wsparcie oraz obecność choroby niedokrwiennej serca wpływały istotnie na wybrane kategorie zachowań zdrowotnych.

Wnioski

Wysokie nasilenie zachowań zdrowotnych prezentowała zdecydowana większość badanych. Pacjenci najwyżej ocenili praktyki zdrowotne, w przeciwieństwie do prawidłowych nawyków żywieniowych. Stwierdzono istotny statystycznie związek między kategoriami zachowań zdrowotnych, a wybranymi zmiennymi socjo-demograficznymi i chorobą niedokrwienną serca.

Abstract (in English):

Aim

The objective of the study was to assess health behaviours in a group of cardiac patients after implantation of cardioverter-defibrillator and to assess the correlation between health behaviours and selected socio-demographic and clinical variables. Health behaviours are an essential element of daily activities in every human's life; if they are positive, they may improve health. A growing significance of health behaviours such as proper eating habits, preventive measures, health practices and a positive mental attitude can be observed in cardiac patients.

Material and methods

The study was carried out in a group of 176 patients with implanted cardioverter-defibrillator. The average age of respondents was 62.36 (SD=15.41). The study group consisted mainly of men (78.41%). The study was carried out with the application of a self-designed questionnaire and Health Behaviour Inventory according to Juczyński.ResultsThe vast majority of respondents (71.02%) were characterized by a high level of health behaviours. The highest intensity of health behaviours was observed in the case of health practices (average score 4.09; SD=0.63). The lowest score was obtained in the sphere of proper eating habits (average score 3.62; SD=0.77). Variables: age, gender, marital status, education, professional activity, living with family, support or ischaemic heart disease had a significant impact on particular categories of health behaviours.

Conclusions

The vast majority of respondents reported a high level of health behaviours. The aspect which was scored the highest by patients was health practices, contrary to proper eating habits. There was a significant correlation between health behaviours and selected variables.

Corresponding author
Agata Reczek, Zakład Pielęgniarstwa Internistycznego i Środowiskowego, Instytut Pielęgniarstwa i Położnictwa, Wydział Nauk o Zdrowiu, Uniwersytet Jagielloński Collegium Medicum, ul. Kopernika 25, 31-501 Kraków, Polska; email: agata.reczek@uj.edu.pl; hone: 12 430 32 19

Authors (short)
A. Reczek, J. Wojdyła-Piekarz, E. Kawalec-Kajstura

Introduction

Health behaviours are considered to be an essential element of daily activities in every human's life [1]. They are deliberate actions which people consciously take in order to protect, improve or boost their health, regardless of their efficiency [2]. They can be divided into positive and negative ones. Contrary to anti-health behaviours, positive behaviours are aimed at supporting health, preventing diseases and stimulating recovery [1]. According to Ślusarska, health behaviours are a part of total human behaviour and are considerably connected with individual's social life. This author points out the importance of healthy habits acquired in the process of socialization which are consolidated or altered in the adult life. Also the position of the individual in the social structure, which accounts for limiting or stopping certain patterns of behaviour in particular situations, might be connected with health behaviours. Besides social conditions, cultural factors also play a significant role in shaping behaviours connected with health and illness [3]. Culture may affect, for example, the idea of health and illness or perceiving, feeling, describing and interpreting symptoms [1]. There are various models of behaviour among ill people. They affect patients' reactions to the changes which can be observed in their health condition as well as their decisions to seek help, consult a doctor or choose other remedial measures. These behaviours depend on the perception of symptoms, risk assessment, knowledge about the disease, social bonds, age, gender, socioeconomic status and willingness to seek help [2].

Scientific publications prove that, despite the improvement in the results of treatment, cardiovascular diseases are still the main reason of morbidity and mortality. The incidence of factors such as low socio-economic status, lack of social support, work-related and family-related stress, depression, anxiety and other mental disorders may contribute to an increase in the risk of developing cardiovascular diseases and worsen the prognosis connected with these diseases. Moreover, psychosocial factors may constitute a barrier both in following therapeutic advice and in making effort to change one's lifestyle. In this situation factors such as unhealthy lifestyle (frequent smoking, choosing unhealthy food and lower physical activity)

as well as the failure to follow recommendations for behavioural changes and pharmacotherapy come into prominence [4]. Therefore, it is so important to assess health behaviours of patients with cardiovascular diseases including those with implanted cardioverter-defibrillator (ICD). ICD treatment prevents sudden deaths and prolongs the life expectancy of patients from arrhythmia death risk group [5]. ICD is an electronic device whose basic function is diagnosis and treatment of heart chamber arrhythmia. The device functions also as a heart stimulator. Cardioverter-defibrillator diagnoses heart chamber arrhythmia by means of an electrode implanted in the right heart chamber and sends out low – or high-energy shocks in case any abnormal heart rhythm is detected. Low-energy therapies produced by the device are not noticed by the patient, contrary to high-energy cardioversions [6].

The objective of the study was to assess health behaviours in a group of cardiac patients after implantation of cardioverter-defibrillator and to assess the correlation between health behaviours and selected sociodemographic and clinical variables.

Material and methods

The study was carried out between October 2015 and November 2016 in a group of patients with implanted cardioverter-defibrillator who remained under treatment of a cardiology clinic. The patients who participated in the study had their cardioverter-defibrillator implanted for a period of no less than six months from the day of implantation. The study is one of the many aspects of a project on the functioning of patients with an implanted cardioverter–defibrillator. The study was approved by the Bioethics Committee of Jagiellonian University (Approval number: 122.6120.142.2015). The study was conducted as a diagnostic survey. It was carried out with the application of a self-designed questionnaire including basic socio-demographic data and Health Behaviour Inventory according to Juczyński. The Inventory allowed for the assessment of the total intensity of health behaviours and the assessment of the intensity of four categories conducive to health including proper eating habits, preventive measures, health practices and positive mental attitude. Respondents assessed every type of behaviour mentioned in the Inventory on a five-point scale (from 1 to 5). The total score of the intensity of health behaviours ranged between 24 and 120. The higher the score, the greater intensity of health behaviours was observed. General scores were then standardized and presented and interpreted following the rules applicable for sten scores. The sten scores ranging from 1 to 4 are interpreted as very low, whereas those between 7 and 10 are very high. The average outcomes range between 5 and 6 sten scores. The intensity of the four categories of health behaviours was assessed separately. The indicator was, in this case, the average score for each of the examined categories of behaviour [7].

The study involved also an analysis of medical record following established criteria. According to them, the aspects which were analyzed included the reason for which the device was implanted, the number of years since the first ICD implantation and the incidence of chronic diseases.

The study findings were then submitted for a statistical analysis, in which the level of significance was assumed at 0.05. An analysis of quantity variables was carried out by calculating the average score, standard deviation, median, quartiles (Q1 and Q3) as well as the minimum and maximum score. Shapiro--Wilk test was applied to confirm the variables' congruence with normal distribution. In statistical analyses Spearman's rank correlation coefficient, Mann-Whitney U test and Kruskal-Wallis test were applied. In some selected cases post hoc tests were conducted. An analysis of the material was conducted in 3.2.2 version of R program.

Results

Material collected from 176 ICD patients was submitted for an analysis. The average age of respondents was 62.36 (SD= 15.41); age median – 66 (quartiles 1 and 3: 56, 75-72). The vast majority of them were men (78.41%). Table 1 presents detailed sociodemographic characteristics of the examined group. The vast majority of patients (n=120) had ICD implanted as a primary prevention of sudden cardiac death, whereas 56 patients had it implanted as a secondary prevention. As many as 112 patients suffered from ischaemic heart disease and 86 of them had experienced myocardial infarction. Only 28 patients did not have myocardial infarction in the past. 62 patients were not diagnosed with ischaemic heart disease. 92 patients suffered from some other chronic diseases as opposed to 82 patients who did not reported any additional chronic diseases.

Table 1. Characteristics of the examined group of patients

Variable		N	%
Gender	Female	38	21.59%
	Male	138	78.41%
Place of residence	City	118	67.04%
	Country	55	31.25%
	No information	3	1.70%
Type of residence	With family	142	80.68%
	Without family	34	19.32%
Marital status	Single	25	14.20%
	Married	115	65.34%
	Widowed	29	16.48%
	Divorced	7	3.98%
Education	Primary	16	9.09%
	Vocational	57	32.39%
	Secondary	63	35.80%
	Higher	40	22.73%
Professional activity	Employed	28	15.91%
	Retired	103	58.52%
	Disability benefit	40	22.73%
	Other	5	2.28%
Economic status	Very good	5	2.84%
	Good	108	61.36%
	Hard to determine	48	27.27%
	Low	13	7.39%
	No information	2	1.14%
Support of other people	Yes	149	84.66%
	No	26	14.77%
	No information	1	0.57%

General Health Behaviour Inventory scores were converted into stens following the rules applicable for women and men separately. The interpretation is presented in the research methodics. The vast majority of the respondents (71.02%) reported high intensity of health behaviours (7-10 sten scores). Only a small percentage of the respondents (4.55%) reported low intensity of health behaviours (1-4 sten scores - Table 2).

Table 2. Intensity of health behaviours in the examined group of patients

HBI – scores		Interpretation	N	%
Women	**Men**			
24-77	24-71	Low intensity of health behaviours*	8	4.55%
78-91	72-86	Average intensity of health behaviours **	43	24.43%
92-120	87-120	High intensity of health behaviours ***	125	71.02%

* 1-4 sten scores; ** 5-6 sten scores; *** 7-10 sten scores

An analysis of particular categories of health behaviour in the examined group led to a conclusion that the highest intensity was observed in the case of health practices. In turn, the lowest scores were obtained in the category of proper eating habits (Table 3).

Table 3. Categories of health behaviours in the examined group of patients

Categories of health behaviours	N	Mean	SD	Median	Min	Max	Q1	Q3
Proper eating habits	176	3.62	0.77	3.67	1.33	5	3.17	4.17
Preventive measures	176	4.04	0.56	4.17	2	5	3.83	4.5
Positive mental attitude	176	3.99	0.64	4	2.17	5	3.62	4.5
Health practices	176	4.09	0.63	4.17	2.17	5	3.67	4.67

Correlation between health behaviours and selected variables

An analysis of the influence of selected variables on patients' health behaviours was carried out. The variables included respondents' gender. A statistically significant correlation was found between proper eating habits and patients' gender. Women, in comparison to men, scored higher in this health behaviour category (p=0.033). In turn, patients' gender had no significant influence on the total score or on the other categories of health behaviour (Table 4).

Table 4. Health behaviours and patients' gender

Health behaviours	Gender	N	Mean	SD	Me-dian	Min	Max	Q1	Q3	p **
Total score*	Women	38	7.16	1.52	7	3	10	6	8	0.165
	Men	138	7.52	1.63	8	3	10	6	9	
Proper eating habits	Women	38	3.87	0.75	3.92	2.17	5	3.33	4.46	0.033
	Men	138	3.55	0.77	3.67	1.33	5	3.17	4.17	
Preventive measu-res	Women	38	4.12	0.52	4.17	2.33	4.83	3.88	4.5	0.336
	Men	138	4.02	0.57	4.17	2	5	3.67	4.33	
Positive mental attitude	Women	38	4.02	0.53	4.08	3	5	3.54	4.33	0.921
	Men	138	3.98	0.67	4	2.17	5	3.67	4.5	
Health practices	Women	38	3.97	0.7	4.17	2.17	5	3.5	4.5	0.324
	Men	138	4.12	0.61	4.17	2.5	5	3.67	4.67	

* Results presented in sten scores

** Mann-Whitney U Test

Another examined variable was respondents' age. An analysis carried out with the application of Spearman's rank correlation coefficient showed a correlation between patients' age and the total score and selected categories of heath behaviour, i.e. proper eating habits and health practices. The intensity of the aforementioned health behaviours tended to increase along with respondents' age (Table 5).

Table 5. Health behaviours and patients' age

Health behaviours	Correlation with age			
	Spearman's corre-lation coefficient	p	Relationship direction	Degree of relation-ship
Total score	0.227	0.002	positive	very weak
Proper eating habits	0.161	0.032	positive	very weak
Preventive measu-res	0.126	0.096	---	---
Positive mental attitude	0.142	0.06	---	---
Health practices	0.205	0.006	positive	very weak

The next analysis focused on respondents marital status. The analysis was carried out by means of Kruskal-Wallis test and it showed that the total score as well as the categories such as preventive measures, positive mental attitude and health practices were significantly correlated with respondents' marital status and, therefore, it was followed by post hoc analysis. Single and divorced patients scored lower than other respondents in the category of positive mental attitude and total score. Simultaneously, the same group of

respondents reported a lower degree of preventive measures than widowed patients. The behaviours from the category of health practices were the most common in widowed respondents (Table 6).

Table 6. Health behaviours and patients' marital status

Health behaviours	Marital status	N	Mean	SD	Median	Min	Max	Q1	Q3	p **
Total score*	Single; divorced (A)	32	6.62	1.76	7	3	10	6	8	0.007
	Married (B)	115	7.53	1.57	8	3	10	6	9	
	Widowed (C)	29	8	1.25	8	6	10	7	9	A < BC
Proper eating habits	Single; divorced (A)	32	3.49	0.96	3.5	1.33	5	2.79	4.21	0.124
	Married (B)	115	3.6	0.71	3.67	2.17	5	3.17	4.08	
	Widowed (C)	29	3.84	0.79	4	1.83	5	3.5	4.33	
Preventive measures	Single; divorced (A)	32	3.74	0.75	3.92	2	4.83	3	4.33	0.022
	Married (B)	115	4.07	0.51	4.17	2.5	5	3.83	4.5	
	Widowed (C)	29	4.25	0.34	4.17	3.67	4.83	4	4.5	A < C
Positive mental attitude	Single; divorced (A)	32	3.62	0.78	3.83	2.17	5	3.17	4.21	0.008
	Married (B)	115	4.06	0.57	4	2.5	5	3.67	4.5	
	Widowed (C)	29	4.16	0.56	4.17	3	5	3.83	4.5	A < BC
Health practices	Single; divorced (A)	32	3.97	0.6	3.83	2.83	5	3.5	4.5	0.021
	Married (B)	115	4.05	0.66	4.17	2.17	5	3.67	4.5	
	Widowed (C)	29	4.36	0.5	4.5	2.83	5	4	4.67	C > AB

* Results presented in sten scores

** Kruskal-Wallis test; post-hoc test (Dunn test)

Moreover, the application of Kruskal-Wallis test allowed for discovering a significant correlation between the categories of proper eating habits and health practices and respondents' education. An ad post-hoc test proved that patients with secondary education scored higher in the category of proper eating habits than respondents with higher education. At the same time, respondents with primary and vocational educations were characterized by a higher degree of health practices than patients with secondary education. (Table 7).

Table 7. Health behaviours and patients' education

Health behaviours	Education	N	Mean	SD	Median	Min	Max	Q1	Q3	p **
Total score*	Primary; vocational (A)	73	7.64	1.51	8	3	10	6	9	0.372
	Secondary (B)	63	7.33	1.74	7	4	10	6	9	
	Higher (C)	40	7.25	1.55	8	3	10	6.75	8	
Proper eating habits	Primary; vocational (A)	73	3.54	0.68	3.67	2	4.67	3.17	4	0.046 B > C
	Secondary (B)	63	3.82	0.85	3.83	2.2	5	3.17	4.58	
	Higher (C)	40	3.44	0.77	3.5	1.33	4.67	3.12	3.88	
Preventive measures	Primary; vocational (A)	73	4.08	0.5	4.17	2.5	5	3.83	4.33	0.857
	Secondary (B)	63	4.01	0.6	4	2.33	5	3.67	4.5	
	Higher (C)	40	4.04	0.61	4.08	2	5	3.83	4.5	
Positive mental attitude	Primary; vocational (A)	73	4.13	0.56	4.33	2.5	5	3.83	4.5	0.061
	Secondary (B)	63	3.93	0.71	4	2.17	5	3.33	4.5	
	Higher (C)	40	3.85	0.62	3.83	2.17	5	3.5	4.33	
Health practices	Primary; vocational (A)	73	4.2	0.61	4.33	2.17	5	4	4.67	0.022
	Secondary (B)	63	3.93	0.63	4	2.5	5	3.5	4.33	
	Higher (C)	40	4.13	0.65	4.17	2.83	5	3.67	4.67	A > B

* Results presented in sten scores

** Kruskal-Wallis test; post-hoc test (Dunn test)

Patients' professional activity turned out to be another hugely important aspect. The study proved that the total score and the four health behaviour categories are correlated with respondents' professional activity. Both the total score and the scores obtained for the category of health practices were significantly lower in the group of professionally active respondents than in the group of patients who did not work. It was also observed that professionally active patients scored significantly lower in the category of proper eating habits, preventive measures and positive mental attitude than retired respondents (Table 8).

Table 8. Health behaviours and patients' professional activity

Health behaviours	Professional activity	N	Mean	SD	Median	Min	Max	Q1	Q3	p **
Total score*	Employed (A)	28	6.14	1.76	6	3	9	5	8	<0.001
	Retired (B)	103	7.85	1.47	8	4	10	7	9	
	Disability benefit (C)	40	7.28	1.43	7	4	10	6	8	A <BC
Proper eating habits	Employed (A)	28	3.27	0.83	3.37	1.33	5	2.62	3.71	0.019
	Retired (B)	103	3.73	0.74	3.83	1.83	5	3.25	4.33	
	Disability benefit (C)	40	3.52	0.79	3.42	2.17	5	3	4	A < B
Preventive measures	Employed (A)	28	3.69	0.7	3.83	2	4.83	3.12	4.17	0.003
	Retired (B)	103	4.15	0.49	4.17	2.5	5	3.92	4.5	
	Disability benefit (C)	40	4	0.53	4	2.83	4.83	3.67	4.33	A< B
Positive mental attitude	Employed (A)	28	3.75	0.67	3.83	2.17	4.75	3.33	4.33	0.033
	Retired (B)	103	4.1	0.63	4.17	2.17	5	3.75	4.58	
	Disability benefit (C)	40	3.96	0.55	4	2.17	4.67	3.67	4.35	A < B
Health practices	Employed (A)	28	3.58	0.66	3.83	2.17	5	3	4	<0.001
	Retired (B)	103	4.23	0.56	4.33	2.67	5	3.83	4.67	
	Disability benefit (C)	40	4.03	0.62	4.17	2.67	5	3.5	4.5	A< BC

* Results presented in sten scores

** Kruskal-Wallis test; post-hoc test (Dunn test)

A statistically significant correlation was also observed between a positive mental attitude and living with or without family. Patients living with their family scored higher in the aforementioned category (average score 4.07; SD=0.57; median 4.17; quartile 1 and 3: 3.67 and 4.5) than patients living without family (average score 3.68; SD=0.8; median 3.83; quartile 1 and 3: 3.17 and 4.29) (p=0.01). Another factor which had a positive impact on patients' positive mental attitude was the support of other people. Patients who declared receiving such a support scored significantly higher in the category of positive mental attitude (average score 4.04; SD=0.63; median 4; quartile 1 and 3: 3.67 and 4.5) than patients who did not receive it (average score 3.75; SD=0.66; median 3.83; quartile 1 and 3: 3.33 and 4.17) (p=0.043). Living with family and the support of other people did not have a significant influence on the total score and the other categories of health behaviour (p>0.05).

The incidence of ischaemic heart disease turned out to be an essential clinical factor. An analysis conducted by means of Kruskal-Wallis test showed that the incidence of ischaemic heart disease had an influence on the total score and on the category of positive mental attitude (p=0.031 for the total score and p=0.016 for positive mental attitude). According to post-hoc analysis (Dunn test) the respondents without ischaemic heart disease obtained lower total scores (results presented in sten scores), (average score=7; SD=1.69; median 7; quartile 1 and 3: 6 and 8) than the respondents with ischaemic heart disease including those who had a heart attack (average score 7.62; SD=1.54; median 8; quartile 1 and 3: 6 and 9) and the ones who did not have a heart attack (average score 7.89; SD=1.45; median 8; quartile 1 and 3: 7 and 9). At the same time the analysis showed that patients diagnosed with ischaemic heart disease but

without the incidence of heart attack scored higher than other patients in the category of positive mental attitude (average score 4.27; SD=0.59; median 4.45; quartile 1 and 3: 4 and 4.67). In the group of patients who experienced a heart attack the average score for this category was 3.97 (SD=0.64 and median 4; quartile 1 and 3: 3.67 and 4.5), whereas in the group of patients without ischaemic heart disease the average score was 3.9 (SD=0.62; median 3.83; quartile 1 and 3: 3.5 and 4.33).

No statistical correlation was observed during the analysis of the study findings between health behaviours and the place of residence, respondents' economic status, type of sudden cardiac death prevention, the incidence of other chronic disease or the period of time since the first implantation of the cardioverter-defibrillator (p>0.05).

Discussion

ICDs are implanted in people who are at risk of sudden cardiac death (SCD). According to the European Society of Cardiology heart diseases take different forms in younger and older people. Typical problems of younger patients include channelopathy, cardiomyopathy, myocarditis and substance abuse. Elderly patients, in turn, are more likely to suffer from chronic diseases such as ischaemic heart disease, valvular heart disease or cardiac failure. Moreover, elderly people may also suffer from multiple chronic diseases of cardiovascular system. Therefore, as far as SCD prevention is concerned, effective treatment of both primary and concomitant diseases, especially the ones which may provoke arrhythmia is particularly important [5]. In this context a growing importance of patients' activity and commitment to maintaining and boosting their health or making a recovery can be observed. In the case of a disease an active patient looks for some information on his or her condition, its causes and possible treatment; asks the doctor questions; is able to recognize the symptoms and exacerbations of this disease and react accordingly. Such a patient looks for help; takes medicines as prescribed and follows other doctor's recommendations; develops the ability to cope with the disease, negative emotions and tension; adapts their eating habits, physical activity and other health behaviours to their current needs and abilities; gets on well with medical staff and takes advantage of their help [8, p 458]. In the case of a disease, especially a serious one, human health usually becomes the greatest value [7]. It is perhaps the reason why the vast majority of patients who participated in the study and had had cardioverter defibrillator implanted reported a high intensity of health behaviours (71.02%), as opposed to a small percentage of patients reporting a low degree of health behaviours (4.55%). Average scores could be observed in 24.43% of the respondents. The obtained score of health behaviours was significantly higher than in the group of cardiac patients described by Kurpas et al. [9] or Stanisławska et al. [10]. Similar results obtained by Ślusarska et al. [11] in a group of professionally active people were lower; on an average level. Changeability in patients' health behaviour appearing after their first heart attack was observed by Szadkowska et al. [12]. In their study they found out that the intensity of health behaviours rose from an average to high level within a year after heart attack. Perhaps the stress caused by a life threatening condition accounts for patients' modifying their lifestyles.

In the authors' own study the highest scores for health behaviours were obtained in the category of health practices and then in the category of preventive measures and positive mental attitude. The lowest scores were obtained in the category of healthy eating habits. In the group examined by Szadkowska et al. [12] changes in health behaviours also referred mostly to the category of health practices. Similarly, in the study conducted by Kurpas et al. [9] health practices ranked high, as opposed to proper eating habits.

While analyzing health behaviours it should be taken into consideration that there exist strong determinants of health behaviour patterns such as elements of socioeconomic status. They include education, social status and income. Health behaviours may also be affected by variables such as gender, age, marital

status, place of residence, education, profession or economic and family situation [1, 3]. For this reason the authors of the study assessed the influence of selected variables on patients' health behaviours and proved that some variables determined the total score of respondents' health behaviours. These variables included age, marital status, professional activity and ischaemic heart disease. It was observed in the course of the analysis that along with an increase in patients' age, the total score of health behaviours was rising as well. It may be explained by the fact that the given group of respondents consisted mostly of retired or disabled people. In comparison with these respondents, the patients who worked obtained lower total scores. Similar scores were obtained by single and divorced patients. A higher general score was obtained by respondents suffering from ischaemic heart disease. Moreover, it was proved that age, marital status, education and professional activity were correlated with adopting health practices, which were the category of behaviour ranked the highest in the group of ICD patients. Health practices are a category which comprises everyday habits connected with sleep, relaxation and physical activity [7]. The intensity of health practices increased with the patient's age; in the group of widowed respondents or those with primary or vocational education as compared to the respondents with secondary education. It was observed once again that professionally active respondents reported a lower intensity of health behaviours, this time in the category of health practices. These observations coincide with the findings of the study conducted by Schneider-Matyka et al. [13], which imply that professionally inactive respondents were more likely to start pro-health activities than the respondents who worked. The authors of this study pointed out statistically significant differences between respondents' education and all categories of health behaviours except for the category of health practices and the total score of health behaviours. The influence of gender and education on the higher intensity of health behaviours were also observed by Grochans et al. [14]. In the study conducted by these authors women presented a much higher intensity of health behaviours than men and a considerable difference was observed between respondents with vocational education and those with secondary education as far as the total score of health behaviours was concerned. A significant correlation between reported health behaviours and education was also observed in the study by Ślusarska et al. [11]. Respondents with higher education declared a higher level of health behaviours than patients with secondary or vocational education. In the study conducted by Stanisławska et al. [10] patients' age had an influence on general pro-health activities and on adopting health practices. Marital status was significant too as it was responsible for the variety of preventive measures, whereas patients' professional activity accounted for sticking to these measures. On the other hand, the study by Szkup et al. [15] did not discover any significant differences in the distribution of the scores from particular scales of Health Behaviour Inventory depending on professional activities, however, the differences resulting from the respondents' gender were still significant. Women were more likely to follow the rules of preventive healthcare than men were. Also Schneider-Matyka et al. [13] observed that women tend to embrace preventive measures much more frequently. Bearing in mind the findings of aforementioned studies the authors of this study pointed out that marital status of ICD patients had an impact on the category of preventive measures. The analyses showed that single and divorced patients scored lower in the category of health behaviours than widowed ones. Similarly, a group of professionally active respondents declared lower intensity of health behaviours in this category than other patients.

The authors' own study also showed that there are significant differences between the scores obtained in the categories of positive mental attitude and respondents' marital status , their professional activity, living with or without family, sense of support and the incidence of ischaemic heart disease. The lowest scores were obtained by single and divorced patients as well as by professionally active respondents. Respondents who lived with their families and experienced the sense of support reported a higher intensity of positive mental attitude. Also the patients diagnosed with ischaemic heart disease had higher scores in the category

of positive mental attitude in comparison with patients without such a diagnosis. No experience of heart attack turned out to be a significant factor. The study of Stanisławska et al. [10] showed that respondents' age had an influence on their positive mental attitude. In turn, in the study by Szkup et at. [15] positive mental attitude was the same both in female and male group.

The own study shows that gender, age, education and professional activity had a significant influence on patients' proper eating habits. Contrary to men, women reported a higher intensity of proper eating habits. The intensity of these habits also increased with the respondents' age. Patients with secondary education reported a higher intensity of proper eating habits. Similarly, in the study conducted by Szkup et al. [15] proper heating habits were more frequent in the group of women than in the group of men. It should be pointed out that professionally active ICD patients were characterized by a lower intensity of proper eating habits as compared to retired patients. Other authors [9, 11, 13, 15] also notice that in comparison with other categories of health behaviours, proper heating habits are significantly lower in the examined groups of respondents.

The study leads to a disturbing conclusion that in professionally active people both the total score and the intensity of health behaviours in all examined categories were significantly lower than in people who did not work. Therefore, it seems essential to include this information in the program of health education for cardiac patients.

Conclusions

1. The vast majority of the examined patients declared a high intensity of health behaviours.
2. The examined patients ranked their health practices the highest as opposed to their proper eating habits.
3. Respondents' health behaviours were determined by analyzed sociodemographic variables such as age, gender, marital status, education, professional activity, living with family, sense of support or the incidence of ischaemic heart disease.
4. An analysis of health behaviours must be taken into account while planning health education for patients with implanted cardioverter-defibrillator.

Recommendations for nursing practice

As the category of proper eating habits was ranked the lowest by the examined patients, the following recommendations for nursing practice refer mostly to this particular category of behaviour. Firstly, it is essential to make patients aware of the necessity to follow the prescribed therapy in order to stop or limit the consequences of their disease. Then it seems vital to support patients in their following a healthy lifestyle based on cognitive behavioral methods and to shape their motivation to take care of their own health. Therapeutic education should be planned and conducted according to patients' age and their cognitive and communication skills in order to change bad health behaviours including improper eating habits. Such education is indispensable because bad eating habits might increase the risk of cardiovascular diseases and other chronic diseases. According to the recommendations of the European Society of Cardiology (ESC) [4] it is vital to promote a healthy diet among patients so that they could reach and keep proper weight, which is vital because of its positive influence on metabolic risk factors and reducing cardiovascular risk. In is also essential to provide patients with informative materials about proper eating habits in their particular health condition.

References

1. Gruszczyńska M, Bąk-Sosnowska M, Plinta, R. Zachowania zdrowotne jako istotny element aktywności życiowej człowieka. Stosunek Polaków do własnego zdrowia. Hygeia Public Heal. 2015; 50(4): 558-65.

2. Woynarowska B. Styl życia i zachowania zdrowotne. [in:] Woynarowska B. (ed.). Edukacja zdrowotna. Warszawa: Wydawnictwo Naukowe PWN; 2017

3. Ślusarska B. Zachowania zdrowotne w prewencji ryzyka sercowo-naczyniowego. Folia Cardiol Excerpta 2012; 7: 51–9.

4. Piepoli MF, Hoes AW, Agewall S, et al. Wytyczne ESC dotyczące prewencji chorób układu sercowo-naczyniowego w praktyce klinicznej w 2016 roku. Kardiol Pol 2016; 74(9): 821–36.

5. Priori SG, Blomström-Lundqvist C, Mazzanti A, et al. Wytyczne ESC dotyczące postępowania u pacjentów z komorowymi zaburzeniami rytmu oraz zapobiegania nagłym zgonom sercowym w 2015 roku. Kardiol Pol 2015; 73(10): 795–900.

6. Mazurek M, Lenarczyk R, Kowalski O, Kalarus Z. Co lekarz praktyk powinien wiedzieć o automatycznym kardiowerterze-defibrylatorze? Chor Serca i Naczyń 2014; 11(3): 128–37.

7. Juczyński Z. Narzędzia pomiaru w promocji i psychologii zdrowia. Warszawa: Pracownia Testów Psychologicznych Polskiego Towarzystwa Psychologicznego; 2012

8. Woynarowska-Sołdan M, Woynarowska B. Edukacja do bycia aktywnym pacjentem. [in:] Woynarowska B (ed.). Edukacja zdrowotna. Warszawa: Wydawnictwo Naukowe PWN; 2017

9. Kurpas D, Kusz J, Jedynak T, Mroczek B. Ocena częstości podejmowania zachowań zdrowotnych w grupie pacjentów chorych przewlekle. Fam. Med. Prim. Care Rev. 2012; 14, 2: 183–185.

10. Stanisławska M, Rajzer M, Jurczak A, Augustyniuk K, Reczyńska A, Grochans E. Podejmowanie działań prozdrowotnych przez pacjentów z chorobami kardiologicznymi. Medical & Health Sciences Review 2015; 1(1): 19-26.

11. Ślusarska B, Nowicki G. Zachowania zdrowotne w profilaktyce chorób układu krążenia wśród osób pracujących. Probl Hig Epidemiol 2010; 91(1): 34-40.

12. Szadkowska I, Szadkowski K, Migała M. et al. Zmienność zachowań zdrowotnych pacjentów z pierwszym zawałem serca leczonych metodą pierwotnej angioplastyki wieńcowej-obserwacja roczna. Hygeia Public Heal. 2016; 51(1): 77-81.

13. Schneider-Matyka D, Bieniasz E, Szkup M, Stanisławska M, Jurczak A. Ocena zachowań zdrowotnych pacjentów z chorobami układu krążenia. Forum Med. Rodz. 2015; 9(2): 155–7.

14. Grochans E, Gburek D, Polakiewicz P. et al. Ocena zachowań zdrowotnych pacjentów z uwzględnieniem zmiennych socjodemograficznych. Fam. Med. Prim. Care Rev. 2012; 14, 2: 148–50.

15. Szkup M, Starczewska M, Skotnicka I, Jurczak A, Grochans E. Ocena zachowań zdrowotnych pacjentów zakwalifikowanych do zabiegu kardiochirurgicznego. Fam. Med. Prim. Care Rev. 2014; 16(2): 169–71.