

Juraszek Karolina, Kalisz Zdzisława, Wojtkowiak Marcin, Kucharczuk Magda, Kalisz Justyna, Krajewski Stanisław. Effects of health behaviours on the quality of life of patients following intervention cardiology procedures. *Journal of Education, Health and Sport*. 2019;9(8):179-198. eISSN 2391-8306. DOI <http://dx.doi.org/10.5281/zenodo.3371663>  
<http://ojs.ukw.edu.pl/index.php/johs/article/view/7269>

The journal has had 5 points in Ministry of Science and Higher Education parametric evaluation. § 8. 2) and § 12. 1. 2) 22.02.2019.

© The Authors 2019;

This article is published with open access at Licensee Open Journal Systems of Kazimierz Wielki University in Bydgoszcz, Poland

Open Access. This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author (s) and source are credited. This is an open access article licensed under the terms of the Creative Commons Attribution Non commercial license Share alike. (<http://creativecommons.org/licenses/by-nc-sa/4.0/>) which permits unrestricted, non commercial use, distribution and reproduction in any medium, provided the work is properly cited.

The authors declare that there is no conflict of interests regarding the publication of this paper.

Received: 05.07.2019. Revised: 25.07.2019. Accepted: 19.08.2019.

## **Effects of health behaviours on the quality of life of patients following intervention cardiology procedures**

### **Wpływ zachowań zdrowotnych na jakość życia pacjentów po przebytych zabiegach kardiologii interwencyjnej**

**Karolina Juraszek<sup>1,2</sup>, Zdzisława Kalisz<sup>3</sup>, Marcin Wojtkowiak<sup>3</sup>, Magda Kucharczuk<sup>4,5</sup>,  
Justyna Kalisz<sup>6,7</sup>, Stanisław Krajewski<sup>8</sup>**

<sup>1</sup> Department of Physiotherapy, Collegium Medicum, Nicolaus University in Toruń, Poland

<sup>2</sup> Eskulap Hospital in Osielesko, Rehabilitation Center, Poland

<sup>3</sup> Univeristy of Bydgoszcz, Poland

<sup>4</sup> Surgery Unit, 10th Military Research Hospital and Polyclinic, Bydgoszcz, Poland

<sup>5</sup> Department of Public Health, Collegium Medicum, Nicolaus University in Toruń, Poland

<sup>6</sup> Hematology Department, Nicolaus Copernicus Specialist Municipal Hospital in Torun, Poland

<sup>7</sup> Department of Principles of Clinical Medicine, Collegium Medicum, Nicolaus Copernicus University in Toruń, Poland

<sup>8</sup> Neurosurgery Unit, 10th Military Research Hospital and Polyclinic, Bydgoszcz, Poland

#### **Address to correspondence:**

mgr Karolina Juraszek

[fizjoterapia.juraszek@gmail.com](mailto:fizjoterapia.juraszek@gmail.com)

## **Abstract**

**Introduction:** Diseases of the cardiovascular system are the main health problem of the population not only Polish, but also highly developed countries. Invasive treatment largely contributes to the reduction of mortality, cardiac complications and improves the quality of life of patients. Paying attention to the quality of life of people after cardiac episodes, can help to modify and achieve better therapeutic effects.

**The aim of a study:** Assessment of the impact of health behaviours on the quality of life of patients following intervention cardiology procedures.

**Material and methods:** The study was carried out on a group of 100 people, treated in the Department of Cardiology, the Department of Intensive Cardiac Supervision, the Hemodynamic Work of the Multidisciplinary Hospital of Ludwik Blazek in Inowroclaw. A questionnaire consisting of 22 single-choice questions was used to assess the quality of life of patients.

**Conclusions:** 1. Close to 60% of respondents positively determines their quality of life. 2. The relationship between the effects of pro-health behaviours and quality of life has not been demonstrated. 3. The level of patient awareness of positive health behaviours is small, only a minority progresses according to their principles. 4. Unconsciousness of the health status of patients of the branch causes no reference to staff recommendations. 5. Alarming is preferring anti-health behaviour.

**Key words:** quality of life, diseases of the cardiovascular system

## **Admission**

Diseases of the cardiovascular system are the main problem of the human population. They are the most common cause of death, lead to permanent disability or invalidity. They belong to the ranks of civilizational and social diseases, resulting from the development of urbanisation or intensive industrialization, including living conditions and changes in diet.

In recent years, there has been a much greater interest in the quality of life of people struggling with cardiological diseases. There was a shift from medical definition of the health model to biopsychosocial. More and more often, apart from the medical approach, the assessment of the state of well-being, emotional sensations or quality and possibility of functioning in everyday life is carried out. Modern methods of treatment and diagnosis, although necessary to achieve the

expected effects impose many restrictions on patient. In addition to clinical evaluation, quality of life becomes the most important factor in the effectiveness of treatment. Paying attention to the quality of life of people after cardiac episodes, can help to modify and achieve better treatment outcomes [1].

### Quality of life

The concept of health related quality of life (HRQoL) was introduced in 1990 by H. Shipper. He defined quality of life as a functional effect of the disease and its treatment perceived by the patient [2]. This definition remains in close relation to the definition of health formulated by the WHO (World Health Organization) - full of mental and social well-being, and not just the absence of disease [2]. According to this definition, basic aspects of the functioning of the treated person were taken into account. These include mental state, physical condition, economic and social conditions and somatic sensations [3,4].

When analysing the consequences of cardiovascular disease in clinical aspect, the risk of death, survival, pain, physical fitness and the possibility of professional work should be taken into account. Today, attention is increasingly drawn to social activity, access to medical care, medical consultations, access to rehabilitation, economic status or the patient's understanding of its role in the treatment process. Reflecting on the factors influencing quality of life, it is also necessary to take into account both lifestyle and health behaviour. Without the awareness of the sick, attempting to implement proper health behaviours is impossible to return to full health of both physical, mental and social [5].

### Cardiovascular diseases

Diseases of the cardiovascular system, are the most common cause of death not only in Poland, but other highly developed countries. They are also the cause of disability, poorer quality of life and loss of working capacity. It significantly affects the increase in the cost of medical care [6]. According to the World Health Organization data, in 2012 years, mortality due to cardiovascular incidents in Poland was 323/100000/year and the average life expectancy was 77 years [2]. In the report of the National Institute of Public Health annually because of these ailments dies in the country about 170 000 people, which corresponds to 46% of all deaths (data for 2016 years).

Risk factors influencing the epidemic significance of CVD include poorly balanced diet, low physical activity, smoking and excessive alcohol consumption. According to WHO, these factors are responsible in Poland for 55% of deaths and 40% of the life-years lost in health. Both changing the style and modifying these factors can delay the development of the disease and improve the quality of life. Risk factors can be divided into several groups. The first is psychosocative factors such as education, employment status, job type, income, marital status, stress or lack of social

support. The second group is behavioural patterns, among which you can exchange physical activity, diet, smoking, sleep disorders. The third last group are somatic disorders, which includes hypertension, hyperlipidemia, diabetes mellitus, obesity, metabolic syndrome. Age and male gender are also significantly affected by the increase in morbidity. There is a certain relationship between these factors. Psychosocial factors affect health behaviors, which in turn determine somatic risk factors. Both behavioral and somatic risk factors may be subject to certain modifications, while others are not modifiable. Insufficient control and large prevalence of major risk factors determine the current epidemiological situation. In recent years there has been an increased incidence of both diabetes and obesity. Therefore, in the coming years we can expect the importance of these factors as determinants of diseases and deaths [6, 7, 8].

#### Rules for prevention of cardiovascular disease

The main principles of heart disease prevention include:

1. physical activity – every form of movement is healthy;
2. avoiding salt consumption;
3. avoiding fatty foods (lard, fried meat, etc.);
4. eating more fish;
5. eating more vegetables and fruits;
6. avoiding sweets;
7. not smoking cigarettes;
8. regular monitoring of your health status;
9. use of medical advice;
10. taking the recommended drugs regularly if required [9].

Changing the style to pro-healthy is essential for every individual, regardless of age, gender or disease. Such changes always have an unquantifiable benefit. They give a chance to improve negotiations, therapies or quality of life.

#### Modern methods of treatment, rehabilitation and secondary prevention of CVD

Interventional cardiology is a field of medicine that develops extremely dynamically. Often the effects of treatment are incredibly spectacular. Already in a few days after uncomplicated myocardial infarction, the patient comes to health. Such treatments help to restore the heart of its efficiency by performing more accurate diagnosis, taking modern drugs and using less invasive therapy. Thanks to increasingly modern medical equipment, it is possible to reach the heart through blood vessels. The abnormal openings in the heart or part of the heart in which the clot is formed are closed. This is of great importance for a quicker return to active life, less aggravating rehabilitation and a better prognosis for the future [10].

Cardiological rehabilitation is required in patients with uncomplicated cardiac infarcts, cardiac surgery, atherosclerosis, and by-pass implantations, stimulators, cardioverters, percutaneous arterial angioplasty. Cardiological rehabilitation is a comprehensive action designed to prevent heart disease, reduce disease development, improve the quality of life and reduce mortality resulting from cardiovascular disease [11]. Numerous studies conducted in many countries have shown that participation in prevention, education and rehabilitation programmes has significantly improved risk factors and changed lifestyles. According to experts of the Polish Cardiology Association (PTK), all patients after interventional cardiology procedures should be subject to a cardiological rehabilitation programme and secondary prevention, as they represent a group of the highest risk Cardiovascular disease [12,13,14].

Whether the rehabilitation is going to work properly and whether it will have a positive effect also depends on the patients themselves. Unfortunately, despite illness, patients are unwilling to change their habits, which resulted in a serious threat to their health and often directly endanger their lives. The effects on such a condition have on the one hand very high effectiveness of cardiological treatment, with the other unwillingness to change lifestyles.

### **The aim of a study**

Heart diseases or more precisely of the cardiovascular system, are a major health problem for our society. More and more activities are being undertaken that play an important role in the treatment processes and in returning to full efficiency, and also affect the change in style and quality of life. The main aim of the work is to assess the impact of health behaviours on the quality of life of patients after interventional cardiology.

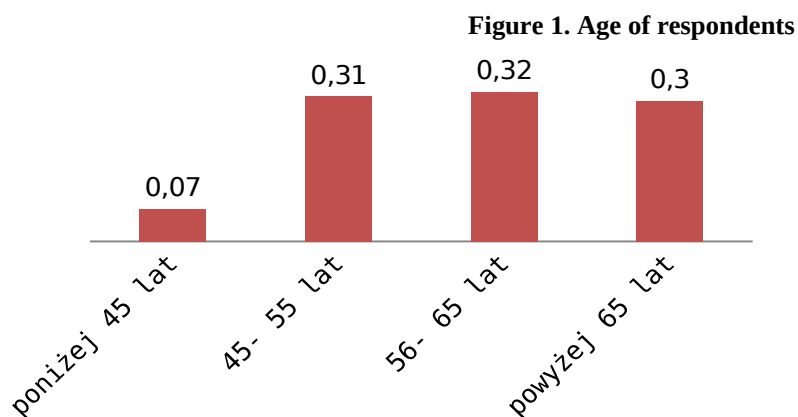
### **Material and methods**

The study involved 100 patients hospitalized in the Multidisciplinary Hospital of Ludwik Błazek in Inowrocław. W badaniu wzięło udział 100 pacjentów hospitalizowanych w Inowrocławskim Wielospecjalistycznym Szpitalu Powiatowym im. Dr Ludwika Błazka at the Department of Cardiology with Intensive Cardiology Supervision and Hemodynamics Studio.

The research tool was an anonymous survey questionnaire, consisting of 22 single-choice questions. The questions included in the first part of the questionnaire concerned data characterizing the studied population (sex, age, place of residence or degree of education). Further questions assessed health behaviours and lifestyle-physical activity, diet, drug use, control of blood pressure or cholesterol levels. The last part was intended to help answer the question of whether the cardiological procedures affected, if so, to what extent the health status and quality of life.

## Results

The studies involved 100 patients, 48 women and 52 men. Four age groups have been designated to carry out the analysis of the subjects. Seven people are located under the age of 45 years, 31 people representing 31% were from 45 to 55 years, 32 tested in the age range 56 to 65 years which represents 32% of respondents and over 65 years 30% surveyed (figure 1).



The positive correlation between the age of the surveyed patients and the quality of life assessment ( $p=0.1445$ ). Younger people were more likely to judge their quality of life as a good (figure 2).

**Figure 2. The influence of age on the perceived quality of life**

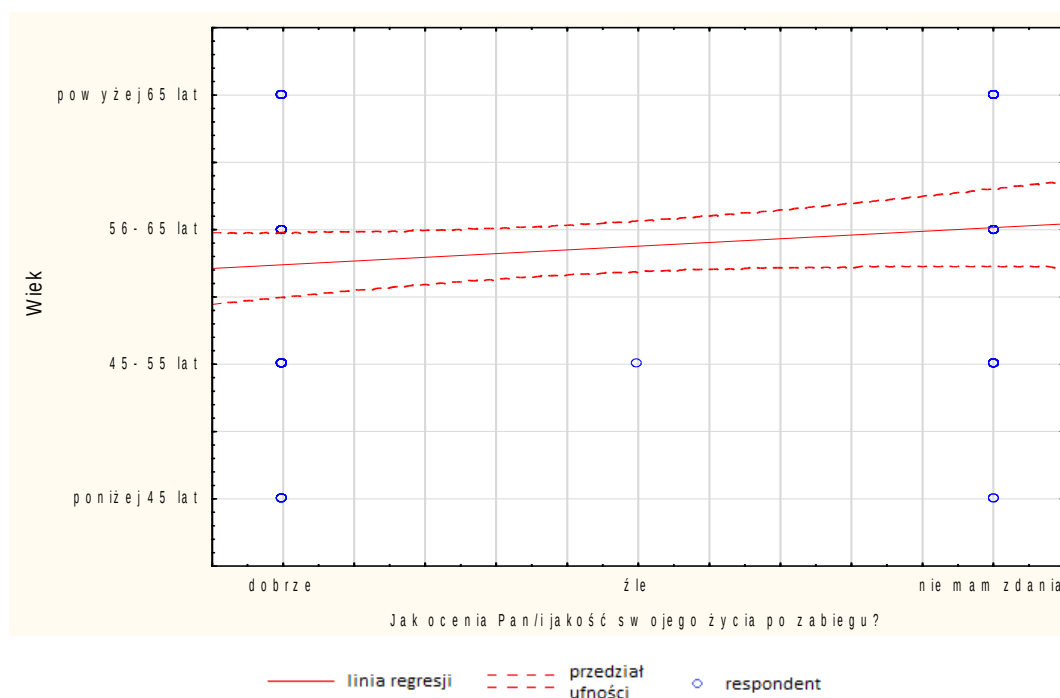
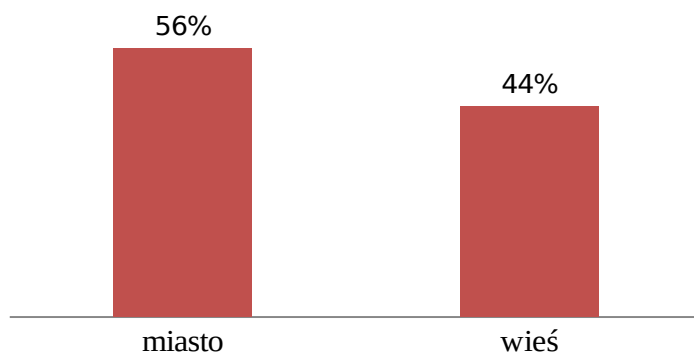


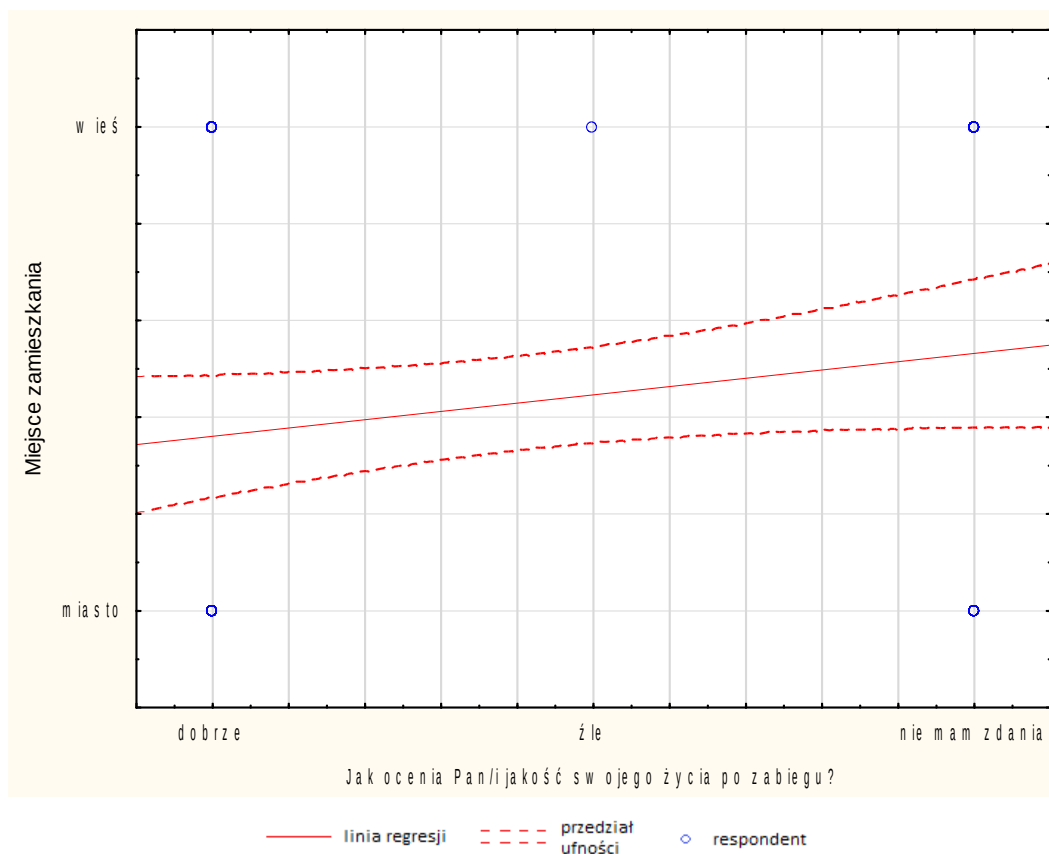
Figure 3 shows the place of residence. The data obtained are contained in two groups. The first group involved urban residents, representing 56%, and 44% were respondents residing in the countryside.

**Figure 3. Place of residence**



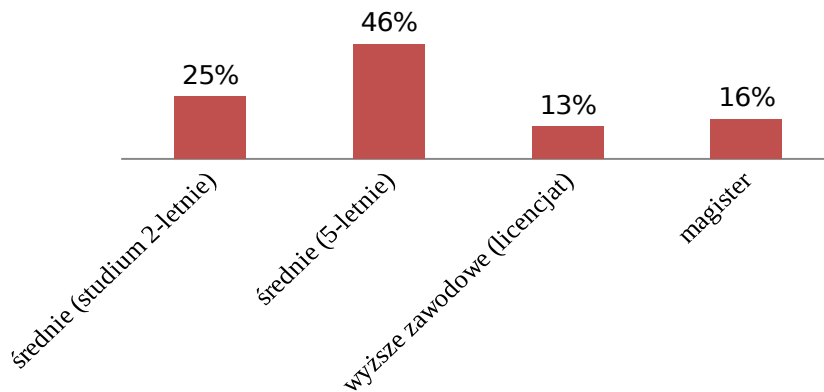
A positive correlation between the place of residence of the respondents and the quality of life assessment ( $P = 0,168966$ ) has been demonstrated. People living in the city were more likely to judge their quality of life as a good (figure 4).

**Figure 4. Impact of the place of residence on the quality of life assessment**



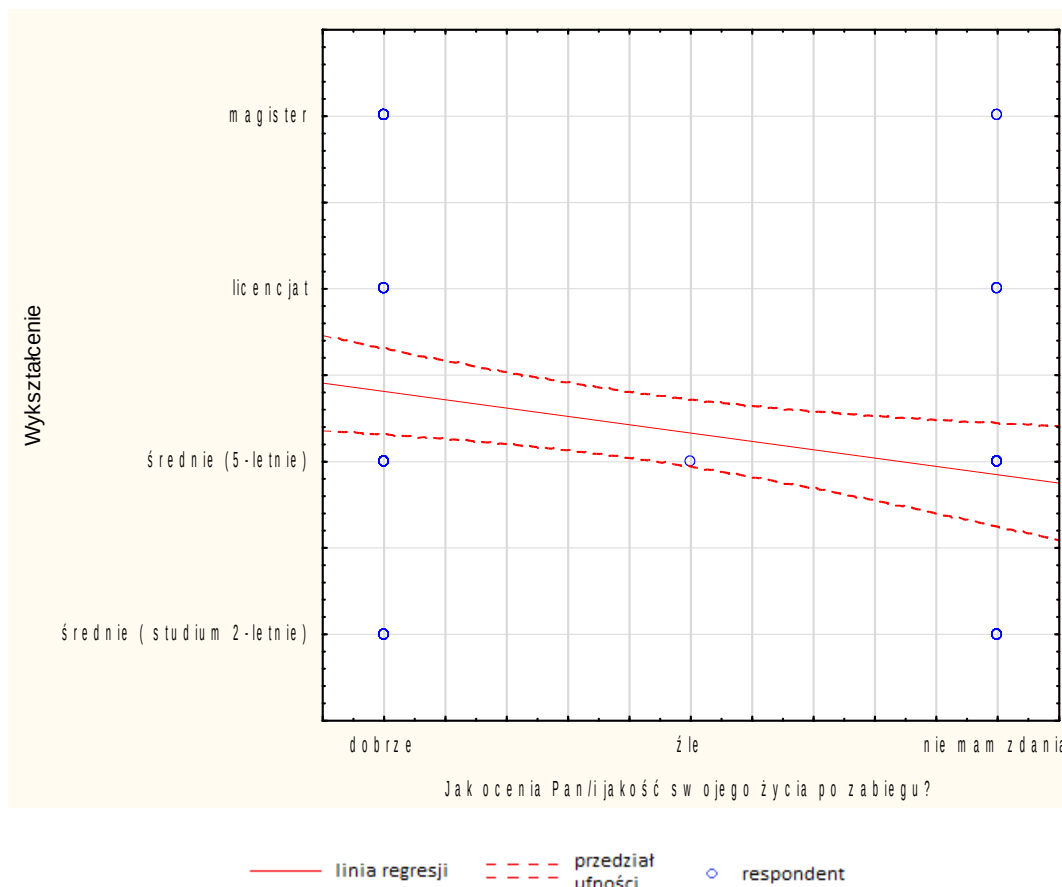
The studies examined the education of respondents. 25% of respondents have a secondary education (2-year study), 46% 5-year average, while higher vocational education-13% have a bachelor's degree and 16% master's degree (figure 5).

**Figure 5. Education of the respondents**



A negative correlation between education and quality of life has been shown to ( $p = -0.239717$ ). The higher the education the more often these people have assessed their quality of life well (figure 6).

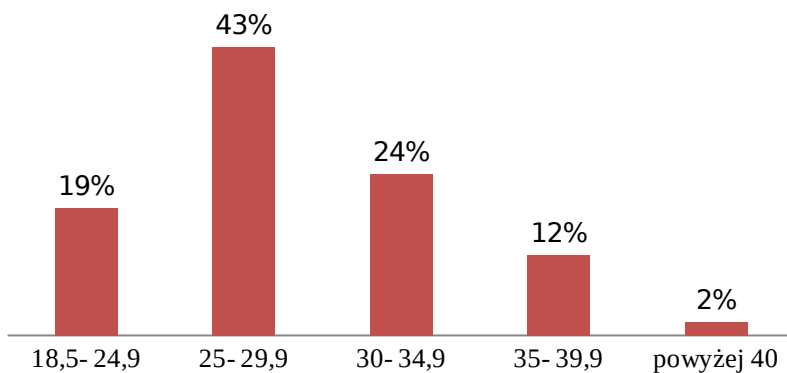
**Figure 6. Impact of education on quality of life assessment**





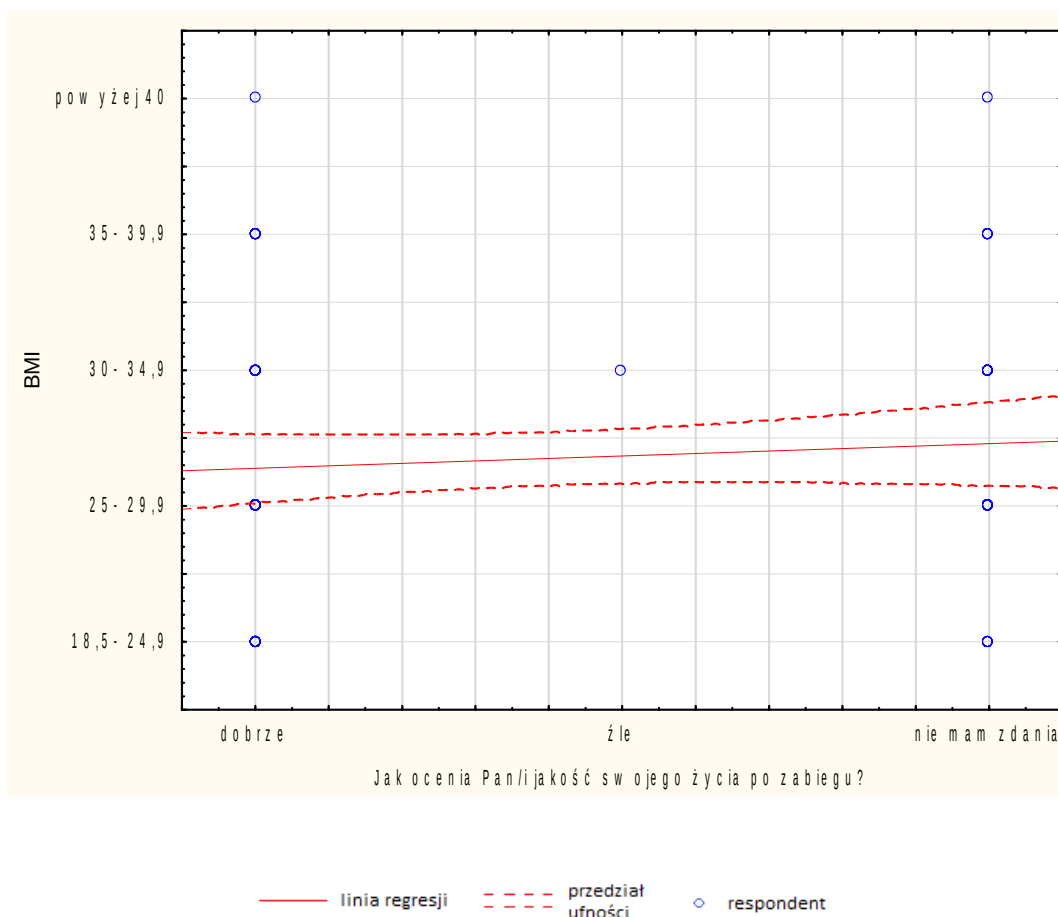
The analysis of the questionnaires shows that 18% of respondents defined their BMI as 18.5-24.9, 43% as 25-29.9, 30-34.9-12% as 35-39.9, and 2% of the respondents have a BMI above 40, indicating the degree of obesity (figure 7).

**Figure 7. BMI of the respondents**



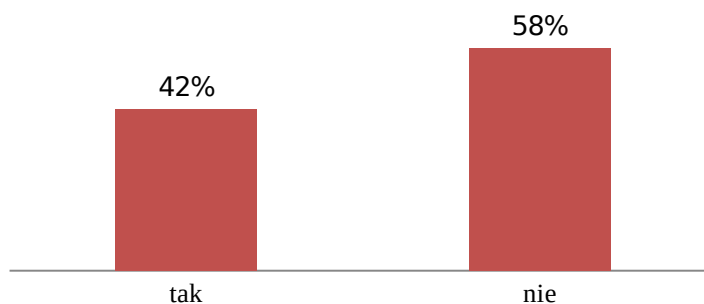
Positive correlation between BMI and quality of life assessment ( $P = 0,090041$ ) has been demonstrated. The BMI has no influence on the quality of life of the subjects (figure 8).

**Figure 8. Impact of BMI on quality of life assessment**



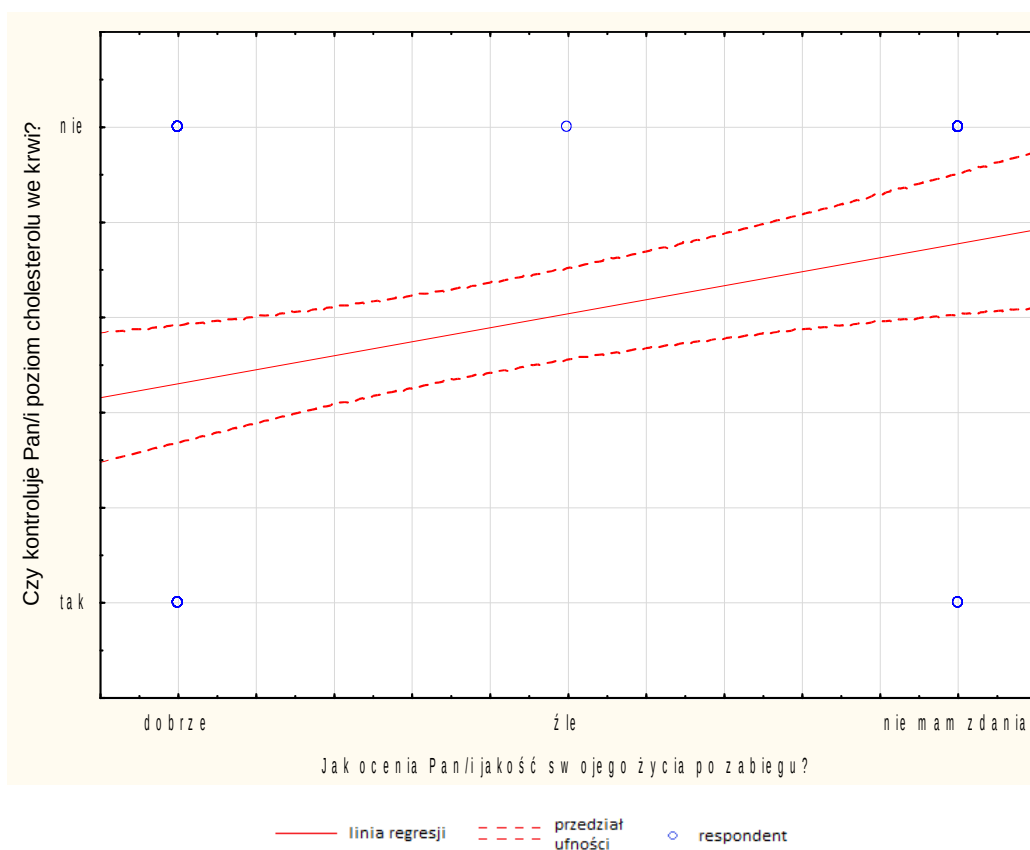
The analysis of the data received shows that 42% of respondents control cholesterol levels in the blood and 58% do not. (figure 9).

**Wykres 9. Control of blood cholesterol levels by patients**



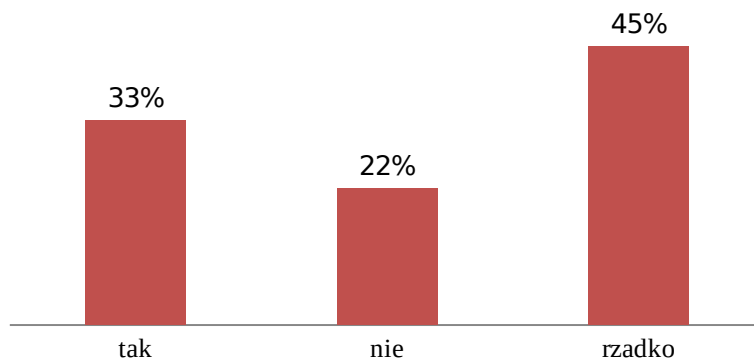
A positive correlation between cholesterol control and quality of life was found ( $p=0.290843$ ). Individuals controlling cholesterol levels more often assessed their quality of life as good in contrast to those not measuring it (figure 10).

**Wykres 10. The effect of controlling cholesterol levels on quality of life assessment**



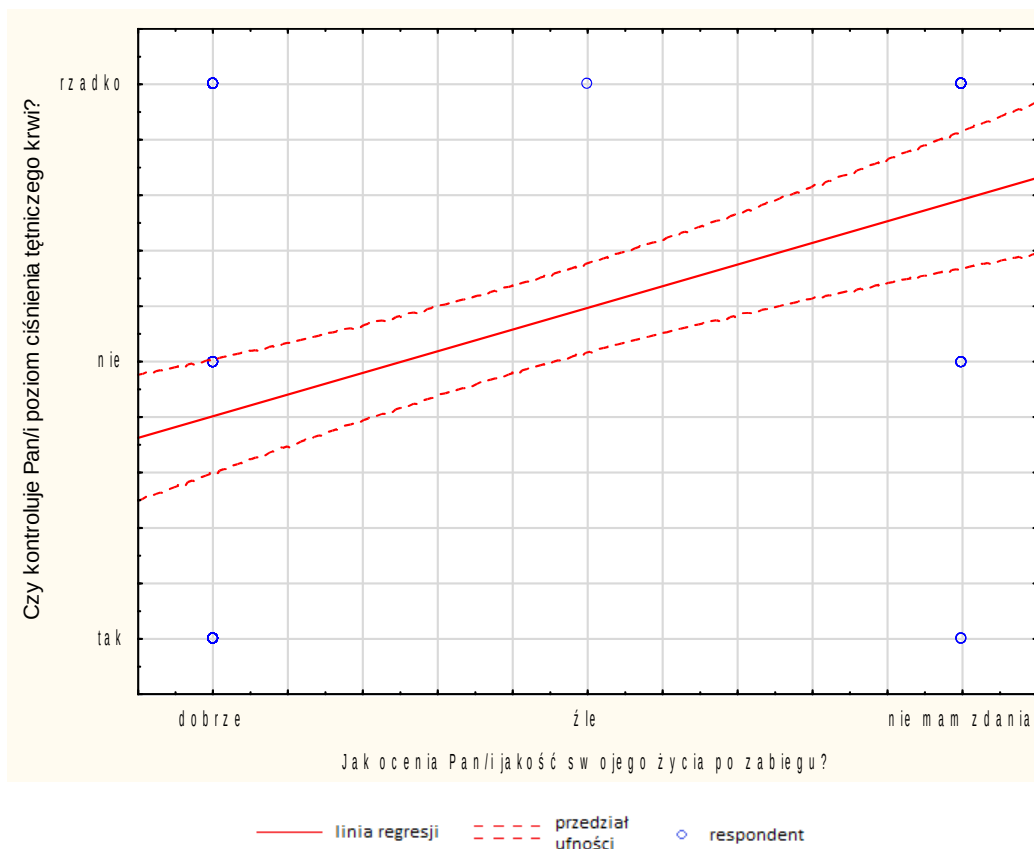
The study also looked at the control of blood pressure by respondents. As is apparent from the data received, only 33% of people control the level of blood pressure, 22% do not do this and 45% does this rarely (figure 11).

**Figure 11. Blood pressure control**



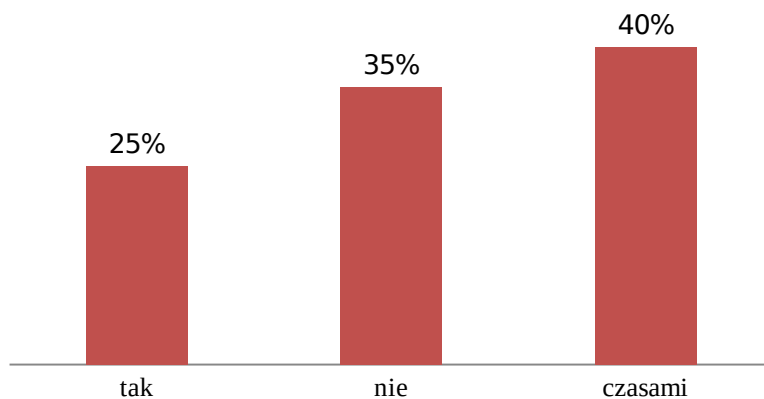
A positive correlation between blood pressure control and quality of life was found ( $p=0.436238$ ). People who control blood pressure have assessed the quality of their lives as good. Individuals who do not control blood pressure have assessed the quality of life as inferior (figure 12).

**Figure 12. Effect of blood pressure control on quality of life assessment**



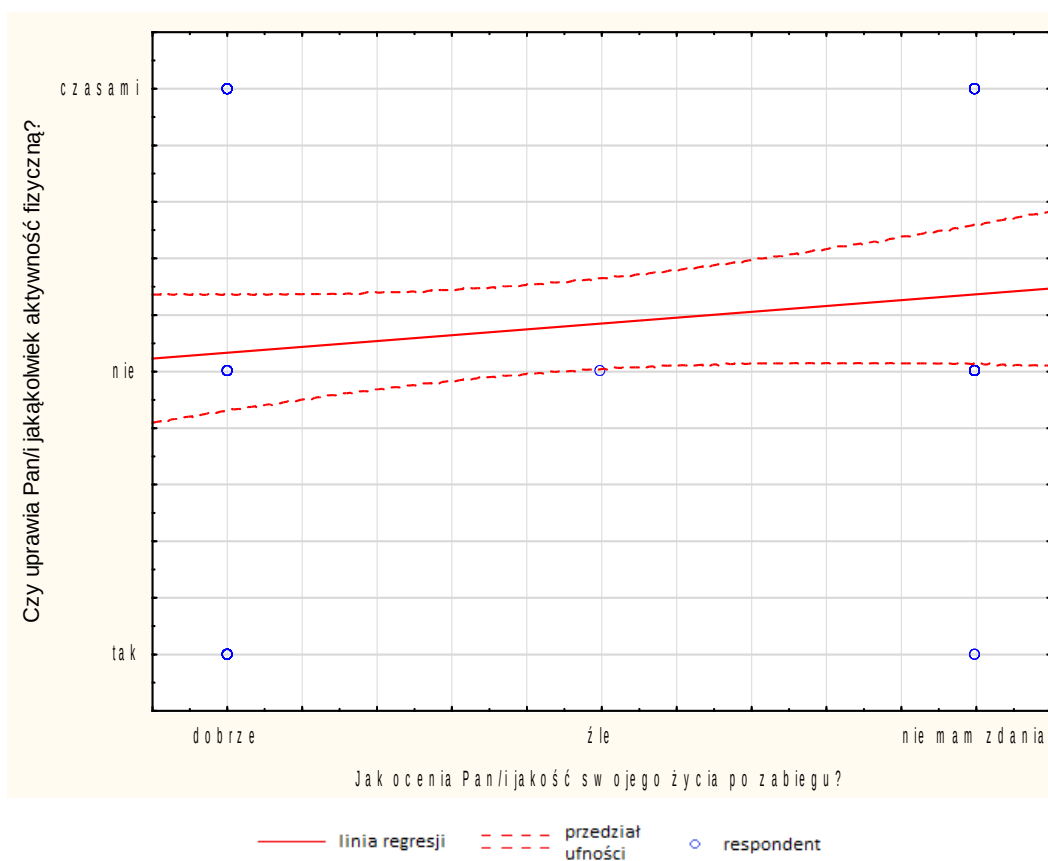
Physical activity is practiced by 25% of respondents, 35% do not practice and 40% do it sometimes (figure 13).

**Figure 13. Physical activity of respondents**



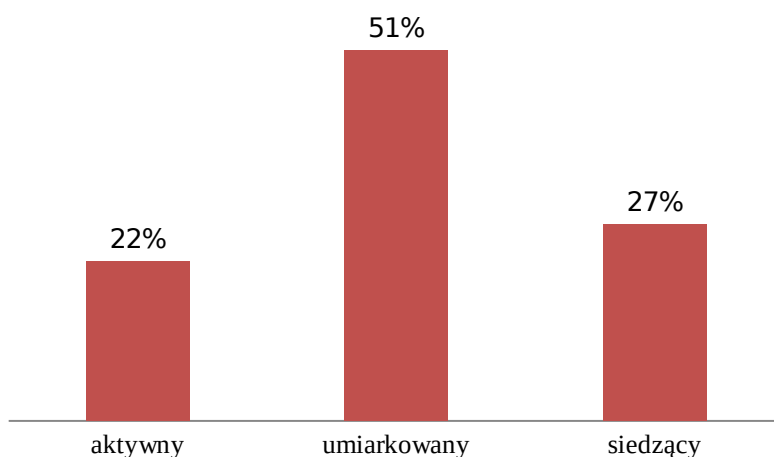
A positive correlation between physical activity and quality of life was found ( $p=0.127315$ ). Practicing physical activity has no influence on this (figure 14).

**Figure 14. Practicing physical activity and quality of life assessment**



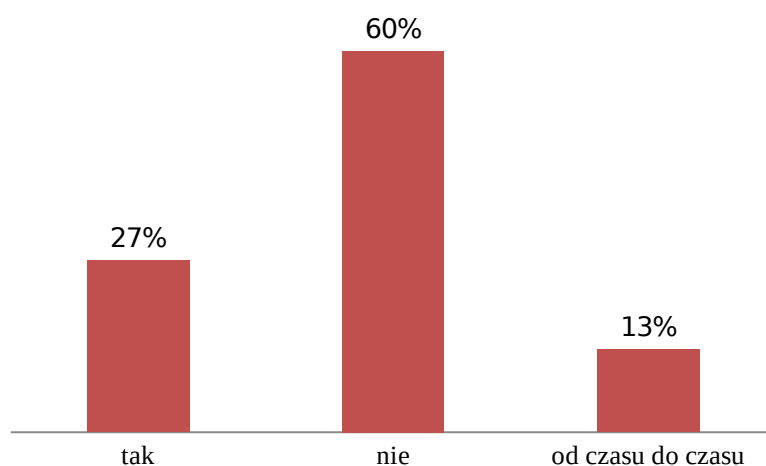
The research showed that 22% of respondents declare active lifestyle, 51% moderate and 27% sedentary (figure 15).

**Figure 15. Patient lifestyle**



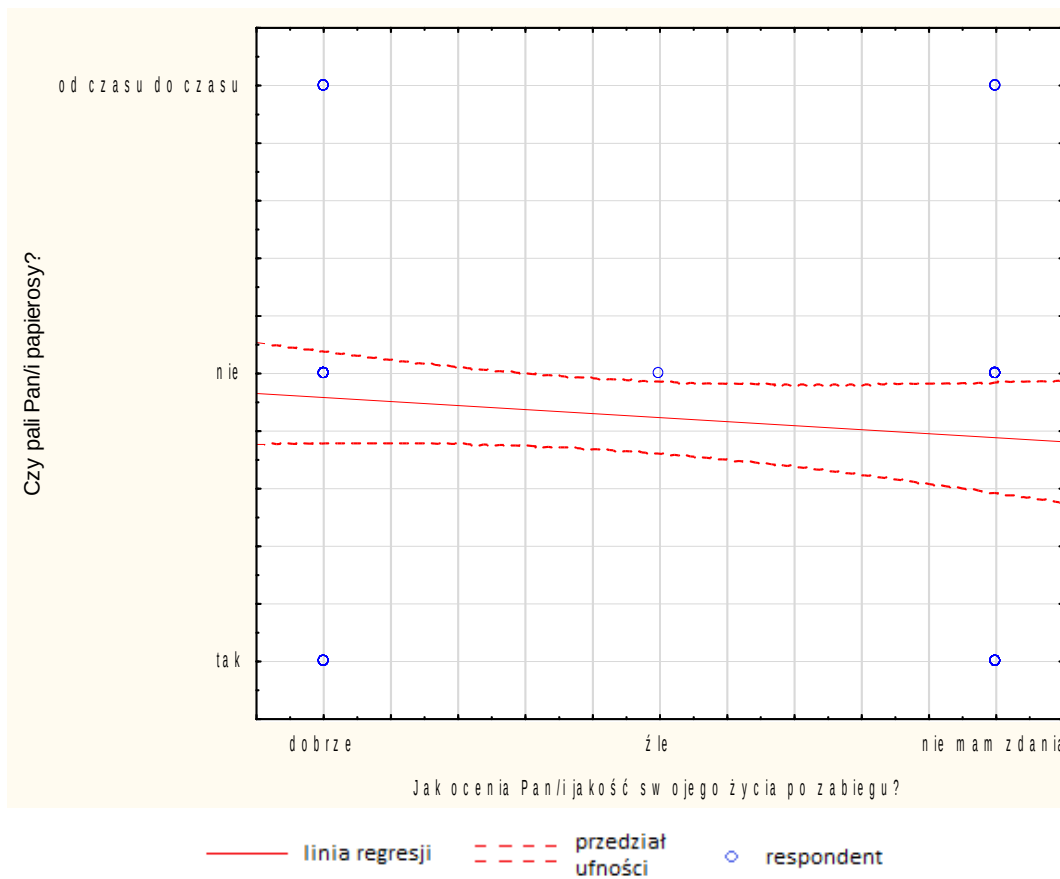
In the analysed group, 27% of respondents admit that they smoke cigarettes, 60% do not smoke and 13% smoke from time to time (figure 16).

**Figure 16. Cigarette smoking by respondents**



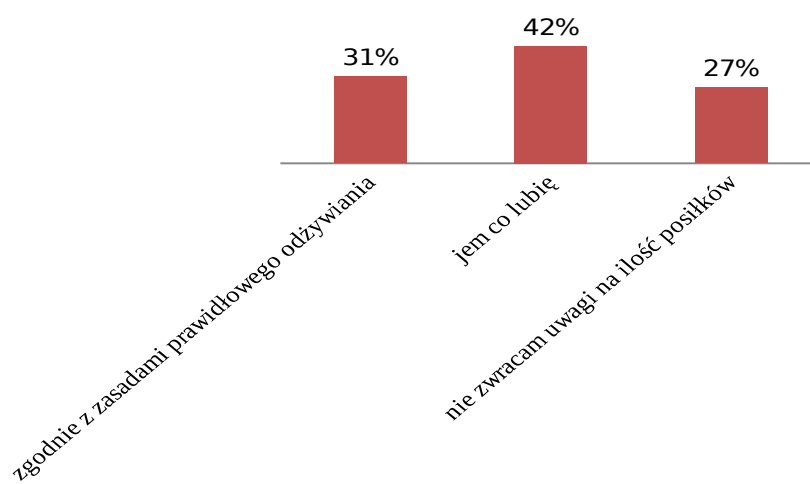
A negative correlation between cigarette smoking and quality of life assessment ( $P = -0.110561$ ) has been demonstrated. Cigarette smoking has no influence on this (figure 17).

**Figure 17. The impact of cigarette smoking on quality of life assessment**



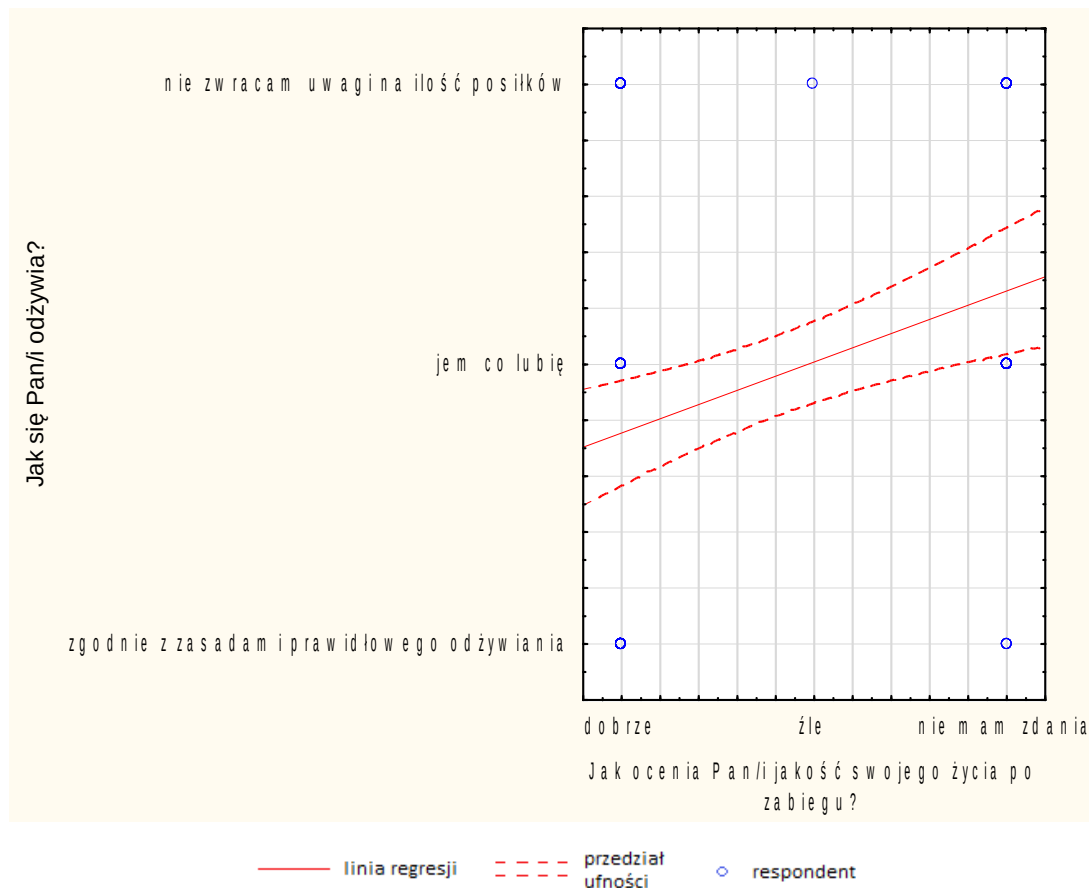
The analysis shows that 31% of people declare that they are nourishing according to the principles of proper nutrition, 42% of what they like and 27% do not pay attention to the amount of meals (figure 18).

**Figure 18. Nutrition of patients**



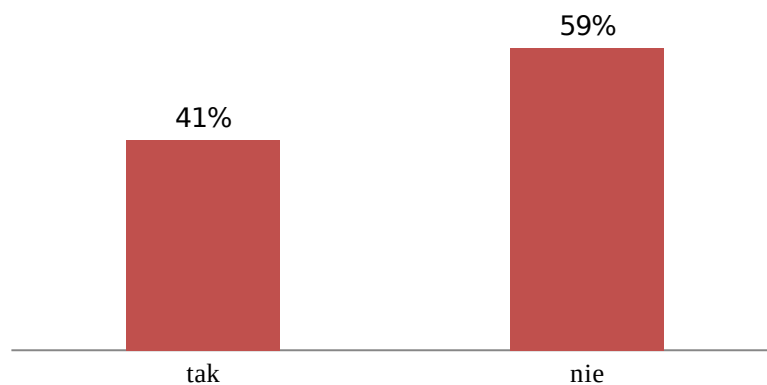
Positive correlation between diet and quality of life assessment ( $P = 0,326338$ ) has been demonstrated. People eating in accordance with the principles of proper nutrition have more often assessed their health status as good (figure 19).

**Figure 19. Effects of nutrition on quality of life assessment**



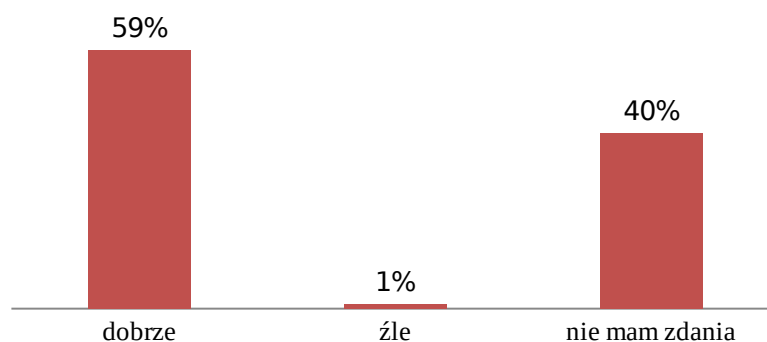
41% of respondents admit that after cardiological procedure they changed their lifestyle and 59% did not (figure 20).

**Figure 20. Change in lifestyle after cardiological surgery**



The quality of life after the procedure is assessed as good by 59% of respondents, 1% as bad and 40% do not have an opinion on this subject (figure 21).

**Figure 21. Assessment of the quality of life after the procedure**



## **Discussion**

The following results were obtained from the analysis of own studies. More than half of the surveyed people are 56% of the city's population. The largest group had a secondary education - 46%. The majority are males-52%. The most numerous group (43%) Has a BMI in the range of 25-29,9 which corresponds to the excess weight. Similar results related to demographic data were obtained in studies conducted by Zboina B. et al. There, the majority of the respondents are also residents of the city - 60%, also the males predominated in the study constituted a group of 60%. The largest group was 47%, with secondary education [15]. The largest group in the Kurpas D. et al study were subjects with a BMI factor of 25-29,9 [16]. The self-study obtained a positive correlation between the age of the respondents and the quality of life assessment Younger people were more likely to evaluate their quality of life positively. A similar result was obtained by Kurpas D. et al. In a study conducted at branches of invasive cardiology [16]. In the study by Rykała J. et al., the dependence of quality of life on age and BMI coefficient was obtained [5]. In own study there was no dependence on the BMI coefficient. A similar result was obtained by Kurpas D. et al., where the dependence of the quality of life on BMI was not confirmed [16]. In the education sphere own research has shown a correlation. Educated people, better evaluated the quality of their lives. A similar result was obtained by Kurkowska K. et al. [17]. The relationship between the place of residence and the quality of life, which was presented at work, is diversified with the study conducted by Kurpas D. et al., in which the inhabitants of the city worse assess the quality of their lives [16].



In own study the following results were obtained concerning health behaviors presented in patients. Nearly 60% of the respondents do not control the cholesterol level. 45% sporadically measure blood pressure and 22% do not do it at all. Only 25% of the respondents practice physical activity. Just over 20% describe their lifestyle as active. Nearly 30% of respondents smoke cigarettes regularly and 13% occasionally. 70% of respondents do not follow the rules of proper nutrition. The results demonstrated the lack of awareness and lack of elementary knowledge of health-related behaviours. Despite these responses, close to 60% of respondents positively define their quality of life. In the studies of Kurpas D. et al. [16] and Reczek A. et al. [8], the relationship between the effects of pro-health behaviours and the quality of life has also not been demonstrated. Research conducted by M. Humańska and P. Orłowski showed that after a myocardial infarction patients are satisfied with their quality of life, but they complain about their health and fear of getting worse. Patients treated with the invasive method have a better opinion of quality of life than patients receiving conservative treatment [18]. The influence of age on physical functioning has been noticed. Younger people functioned better in this area than the elderly. E. Pałczak and I. Uchmanowicz stated that older age has a negative impact on the results concerning the quality of life. Individuals with one co-existing disease better assess the quality of life in the area of physical and mental health from patients with two or three diseases. Negative influence have the occurrence of diabetes mellitus. The analysis of the own study does not confirm the result of I. Uchmanowicz as to the effect of diabetes [19].

Research has shown that patients' awareness of positive health behaviours is small, only a minority progresses according to the rules. Similar results were obtained by K. Sawicka, A. The flower. Research has shown that more than 50% of people have a low level of knowledge of risk factors. People with an average level of knowledge accounted for more than 45%. Only 4% of the subjects had a high level of knowledge of risk factors [20].

The analysis led to knowledge of patients' quality of life assessment. In a minor majority, the assessment of the subjects was satisfactory, while the knowledge of the effects of health behaviours on the whole body's functioning was very negligible. The effectiveness of intervention cardiology procedures allows for immediate improvement of the patient's well-being and health. Unconsciousness of health condition causes lack of reference to staff recommendations. Improving patients' knowledge of regular control of cholesterol levels in the blood and arterial pressure will allow for a quicker observation of worrying symptoms. Pathological changes in the circulatory system of appropriately educated patients will allow immediate intervention of the specialist and reduce the occurrence of life-threatening factors. Education should also focus on presenting positive aspects of an appropriately balanced diet and physical activity, adapting it to the potential and

current condition of the patient. The concern is the fact of preferred anti-health behaviours. It is particularly dangerous that it concerns people who have undergone a life-saving treatment. For the health promoter, this information should be the basis for attempts to modify the behaviour towards health promotion.

## **Conclusions**

1. Close to 60% of respondents positively identifies their quality of life
2. There is no evidence of a relationship between the effects of pro-health behaviour and quality of life.
3. The level of patient awareness of positive health behaviours is small, only a minority progresses according to their principles.
4. Unconsciousness of the patient's state of health causes no reference to staff recommendations.
5. It is worrying that anti-health behaviours occur.

## **References**

1. Bujok G., Tombarkiewicz M. Jakość życia uwarunkowana stanem zdrowia jako nowy problem kliniczny. *Wiadomości lekarskie* nr 58 (91-92), s.67.
2. Shipper H. Quality of life: Principles of the clinicalparadigm. *J. PsychosocialOncol* 1990 nr8 (23), s. 171.
3. Klocek M., Kawecka-Jaszcz. Jakość życia w chorobach układu sercowo-naczyniowego. *Termedia Poznań* 2006, s. 157.
4. Ostrzyżek A. Jakość życia w chorobach przewlekłych. *Problemy Higieniczno epidemiologiczne*, Uniwersytet Humanistyczno-Przyrodniczy w Kielcach, 2008, nr 89 (4), s. 467.
5. Rykała J., Kwolek A. Wpływ wybranych czynników na jakość życia oraz stan funkcjonalny pacjentów po udarze mózgu. *Przegląd Med. Uniwersytetu Rzeszowskiego* 2009, 4., s. 384-391
6. Wojtyniak B., Goryński P. Sytuacja zdrowotna ludności polski i jej uwarunkowania. Raport NIZP-PZH, Warszawa 2016,s.54.
7. Szyguła-Jurkiewicz B., Kowalska M., Mościński M. Praca poglądowa - jakość życia jako element oceny stanu zdrowia i efektywności leczenia chorych ze schorzeniami układu sercowo-naczyniowego. *Folia Cardiologica Excerpta* 2011, tom 6 nr 1, s.67.

8. Reczek A., Stańczykiewicz-Kudła K., Brzostek T. Jakość życia chorych po wszczepieniu stymulatora serca. *Pielęgniarstwo Chirurgiczno Angiologiczne* 2012,2.,s. 107-113.
9. Jankowski P. Zasady profilaktyki chorób układu krążenia w 2018 roku. *Kardiologia inwazyjna* 2017 nr 6 (12), s. 42.
10. <http://www.poradnikzdrowie.pl/zdrowie-krwionosny/kardiologia-inwazyjna-zabiegi-44104.html> (dostęp 05.03.2018.,godz.18:50)
11. Kopeć G., Jankowski P., Pająk A., Drygas W. Epidemiologia i prewencja chorób układu krążenia . Jankowski P., Opolski G., Stepińska J.: Nowoczesny system organizacji i realizacji kompleksowej rehabilitacji i wtórnej prewencji w Polsce. *Medycyna Praktyczna*, Kraków 2015, s. 237.
12. Piepoli M.F., Benzer W., Bjarnason-Wehrens B. Secondary prevention through cardiac rehabilitation. *European J. Cardiovascular Prevention Rehabil.* 2010; 17: s. 1-17
13. Gałaszek M., Eysymontt Z. Aktualny stan rehabilitacji kardiologicznej w Polsce. Raport Sekcji Rehabilitacji i Fizjologii Wysiłku Polskiego Towarzystwa Kardiologicznego 2012; s.23.
14. Mittag O., Schramm S., Bohmen S. Medium-term effects of cardiac rehabilitation in Germany. *EUR. J. Prevention Rehabilitation.* 2011; 18; s.588.
15. Zaczek R., Balsam P., Peller M. Wpływ rehabilitacji kardiologicznej po zawale serca na mikrowoltowy alternant załamka T oraz czynniki ryzyka wyniku nieujemnego. *Kardiologia Inwazyjna* 2017., nr 12, s. 50.
16. Kurpas D., Bąk E., Seń M., Wróblewska I., Mroczek B. Jakość życia pacjentów oddziału kardiologii inwazyjnej. *Family Medicine & Primary Care Review.*, Wydawnictwo Continuo; 2014;16,2: s. 120-123.
17. Kurowska K., Korecińska M. Wpływ zachowań zdrowotnych na jakość życia chorych po zabiegach kardiologicznych. *Pielęgniarstwo Chirurgiczno Angiologiczne.*, 2012,1., s. 20-25.
18. Orłowski P., Humańska M. Jakość życia pacjentów po zawale mięśnia sercowego. *Pielęgniarstwo w Opiece Długoterminowej* 2017 nr 2 30-44
19. Uchamowicz I. Wpływ cukrzycy na jakość życia chorych po angioplastyce tętnic wieńcowych w różnych postaciach klinicznych choroby niedokrwiennej serca, praca doktorska 2008., s.

20. Sawicka K., Grządka A., Łuczyk R., Wawryniuk A., Prazal M., Daniluk A. Świadomość czynników ryzyka choroby niedokrwiennej serca u osób po zawale mięśnia sercowego. *Jurnal of Education, Health and Sport* 2016;6(12), s. 811.