

THE QUALITY OF LIFE OF PATIENTS WITH CORONARY ARTERY DISEASE AFTER PERCUTANEOUS CORONARY INTERVENTIONS

Karolina Hajduga^{A,B,C,D}, Anna Majda^{A,B,C,D,E,F}, Agata Wojcieszek^{D,E,F}, Anna Kurowska^{D,E,F}

Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland

Authors' contribution:

A. Study design/planning • B. Data collection/entry • C. Data analysis/statistics • D. Data interpretation • E. Preparation of manuscript • F. Literature analysis/search • G. Funds collection

Address for correspondence:

Dr hab. Anna Majda, Prof. UJ
Faculty of Health Sciences
Jagiellonian University Medical College
Krakow, Poland
e-mail: anna.majda@uj.edu.pl

SUBMITTED: 26.07.2023

ACCEPTED: 18.08.2023

DOI: <https://doi.org/10.5114/ppiel.2023.133338>

ABSTRACT

Introduction: Due to the dynamic development of interventional cardiology over the past few years, patients with coronary artery disease have the option of invasive treatment and percutaneous coronary interventions (PCI). Patients' quality of life is an important measure of the effectiveness of invasive treatment, especially for chronic diseases such as coronary artery disease. The aim of the study was to evaluate the quality of life of patients with coronary artery disease after PCI, admitted in emergency and elective mode, and to determine the relationship between quality-of-life subscales and selected variables.

Material and methods: The study used a diagnostic survey and estimation method, and a standardized SF-36v2 questionnaire was used to collect data. A group of 108 patients participated in the study. Basic descriptive statistics were analysed together with the Kolmogorov-Smirnov test, frequency analysis, Student's *t*-test for independent samples, the Mann-Whitney *U* test, and Spearman's rho correlation analysis. The significance level was $\alpha = 0.05$.

Results: Respondents indicated low quality of life in the subscales of general health and vitality. The highest scores were noted in the subscales of social functioning and physical functioning. There were significant differences between groups with acute coronary syndromes (ACS) and chronic coronary syndromes (CCS) in all subscales except social functioning and pain. Patients who consumed alcohol indicated better quality of life than abstainers in all subscales, and there was a positive correlation between frequency of alcohol consumption and quality of life in all subscales. No significant differences were found between smoking among the subjects and their quality of life.

Conclusions: Patients after PCI rated their quality of life higher in terms of social and physical health, but worse in terms of general health, pain perception, and vitality. Patients with ACS had better quality of life after PCI than patients with CCS. Among the surveyed patients, selected lifestyle elements (alcohol drinking, smoking) had a varied relationship with their quality of life, which requires further research. Further research should be conducted on the impact of other factors that potentially affect the quality of life of patients with coronary artery disease after PCI.

Key words: quality of life, coronary artery disease, percutaneous coronary intervention.

INTRODUCTION

Cardiovascular diseases are still a serious health problem of modern civilization, causing the death of about 4.1 million Europeans every year [1]. Myocardial infarction accounts for approximately 30% of deaths, 50% of which occur before arrival at hospital. It should be noted that about 5-10% of patients who survive a heart attack die within a year of its onset, and half of the patients are re-hospitalized after a heart attack [2]. According to the Global Burden of Disease (GBD), 95 thousand women died of cardiovascular disease and 79 thousand men in Poland in 2019. Cardiovascular diseases accounted for 48.61% of women's deaths and 37.8% of men's deaths. In 2019, every fourth Polish woman died of heart disease, which accounted for 25.91% of all causes of death [3]. The National

Health Fund (NFZ) issued a report on ischaemic heart disease, in which it stated that in 2017, 1.6 million people suffered from coronary heart disease in Poland. This accounted for 4.2% of the population [4].

The quality of life of patients is a key indicator of the effectiveness of treatment, especially in the case of chronic diseases such as coronary artery disease, also known as coronary heart disease (CAD). This is a broad term covering all states of myocardial ischaemia, regardless of the pathomechanism [5]. Coronary artery disease can have stable periods for a long time, but it can also become unstable at any time, most often due to acute thromboembolism because of plaque rupture or erosion [1]. The disease is chronic, and most often progressive, and therefore serious, even in apparently clinically stable periods. Due to the dynamic underlying atherosclerotic process, coronary

artery disease causes a variety of clinical disorders that can be classified as acute coronary syndromes (ACS – a group of conditions that occur due to a sudden abnormality between myocardial oxygen supply and demand) or chronic coronary syndromes (CCS – a chronically progressive process, which is inhibited by lifestyle modification, pharmacotherapy, and revascularization of coronary arteries) [1, 6].

Currently, there are several definitions of quality of life. All of them are ambiguous, multidisciplinary, and multidimensional, which reflects various aspects of human functioning. In addition, they are subjective, and their result depends on the mental state, personality, preferences, and value system [7]. The World Health Organization (WHO) has created the concept of health-related quality of life, which reads as follows: “an individual’s perception of his position in life in the context of the culture, value system in which he lives, in relation to his own goals, expectations, standards, and interests” [8].

Due to the multidimensional nature of the quality of life, there are various evaluation criteria. In general, the following dimensions are distinguished: physical – which includes the patient’s ability to perform daily activities such as walking, getting up, or preparing meals; psychological – which concerns the emotional functioning of the patient such as the level of stress, anxiety, depression, sense of control over life, and self-esteem; social – which refers to the patient’s interactions with other people and social relationships such as contacts with family, friends and community; spiritual – which refers to the patient’s values, beliefs, and spiritual aspirations such as a sense of meaning in life, spiritual satisfaction, and religiousness; and functional – which concerns the assessment of the functioning of the whole organism [9].

Patients with coronary artery disease often experience limitations in their daily functioning, which affects their quality of life. Therefore, it is important that treatment not only improves the symptoms of the disease and reduces the risk of complications, but also contributes to improving the overall quality of life of patients.

Over the past dozen or so years, there has been a breakthrough in interventional cardiology, thanks to which patients with serious coronary artery diseases and multimorbidity are more often qualified for percutaneous coronary interventions (PCI) than for classic coronary artery bypass grafting (CABG). Commitment and care on the part of the medical team also have a significant impact on the effectiveness of actions taken in situations threatening the health and life of the patient. The nurse plays an important role in the patient care process and is a key element of the entire treatment process.

The aim of the study was to assess the quality of life of patients with coronary artery disease after

percutaneous coronary angioplasty (PCI), admitted in emergency and elective mode, and to determine the relationship between quality-of-life subscales and selected independent variables, such as: 1) mode of admission to hospital (main diagnosis: ACS, CCS); 2) presence of comorbidities; 3) alcohol consumption; 4) smoking cigarettes; and 5) frequency of consumption of alcoholic beverages and number of cigarettes smoked.

MATERIAL AND METHODS

The study was conducted over a period of 3 months, from 01/01/2023 to 31/03/2023, in one of the Krakow hospitals in the Department of Cardiology and Cardiovascular Interventions. The study implemented a diagnostic survey method with the use of the survey technique and the estimation method with the use of the scaling technique. The research tool was a proprietary questionnaire enabling the collection of information, e.g. on sociodemographic variables and the standardized Short Form 36 Health Survey, version 2. The form was used in Polish language under the license of QualityMetric Incorporated, LLC (Student License Agreement: QUO-01223-D9V9V2). The SF-36v2 questionnaire is intended for subjective assessment of the quality of life. It consists of 36 questions, which are divided into 8 subscales: physical functioning (F), role limitation – physical problems (R), pain (P), general health (H), vitality (V), social functioning (S), role limitation – emotional problems (E), and well-being (W) [10]. At the research design stage, it was agreed that lifestyle variables such as drinking alcohol, smoking, and the frequency of alcoholic beverages and the number of cigarettes smoked would be assessed. These factors have a large impact on increasing the risk of coronary artery disease and heart attack.

Telecommunication techniques were also used in the study, i.e. the study was conducted by telephone conversation. Access to telephone numbers was obtained courtesy of the Specialist Clinic operating at the Clinical Department of Cardiology and Cardiovascular Interventions, on its own request, with the consent of the head of the department and the head of the clinic. Patients who had undergone coronary angioplasty at least one month before the self-study were eligible for the study.

The study was prepared and conducted in accordance with the principles of Good Scientific Practice, the Act of 10 May 2018 on the protection of personal data, the principles of the Declaration of Helsinki, and in accordance with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, and repealing Direc-

tive 95/46/EC (General Data Protection Regulation). The participants of the study were provided with all the necessary information about the study, they were informed, among others, about anonymity, the purpose of the study, voluntary participation in it, and the possibility of withdrawing from participation at any stage of its conduct. The selection of the group for the study was purposeful and convenient. At the study design stage, inclusion criteria were defined (patients with coronary artery disease and one month after PCI; informed consent to participate in the study; age 18-60 years) and exclusion criteria (no PCI performed; no informed consent; age below 18 or over 60 years).

To answer the research questions, statistical analyses were carried out using the IBM SPSS Statistics 26 package. It was used to analyse basic descriptive statistics along with the Kolmogorov-Smirnov test, frequency analysis, Student's *t*-test for independent samples, the Mann-Whitney's *U* test, and Spearman's rho correlation analysis. The effect size/strength measure for the *t*-test for coupled samples was also used – Cohen's *d* and the measure of dependence for the Mann-Whitney *U* test – r_g Glass' biserial rank correlation coefficient. The significance level was $\alpha = 0.05$.

RESULTS

A group of 108 patients participated in the study, of whom 63 were men (58.34%) and 45 were women (41.66%). The average age of the participants was 52.59 years.

In the first stage of the analysis, it was ascertained how the quality of life was assessed among the study group. For this purpose, a frequency analysis for the quality-of-life subscale based on standardized scales was performed, in which scores lower than 50 meant a result below the norm, while scores higher than 50 meant a result above the norm.

The analysis showed that in 2 subscales: general health (H) and vitality (V), scores below the norm prevailed, indicating a low quality of life (worse health) 63.90% and 63.00% of the results below the norm, respectively. In turn, in the case of the remaining 8 subscales, high scores prevailed, indicating a high quality of life (better health). Relatively, the highest number of results above the norm were obtained in the case of the subscales of social functioning (S) (76.9%) and physical functioning (F) (75.00%) (Table 1).

The relationship between the quality-of-life subscales and selected sociodemographic variables was also analysed, such as main diagnosis (admission mode – acute, planned; ACS vs. CCS), the presence of comorbidities, and the frequency of alcohol consumption and the frequency of smoking.

First, an attempt was made to determine whether the main diagnosis (ACS vs. CCS) differentiated the results in terms of quality-of-life dimensions.

The analysis showed significant differences between the groups in almost all quality-of-life subscales except pain (P) and social functioning (S), and it was shown that people with ACS were characterized by higher quality of life scores compared to people with CCS. The values of Cohen's *d* effect coefficient indicate that these differences in the case of physical functioning (F) were strong ($d > 0.8$), in the case of vitality (V), role limitation – emotional problems (E), physical and mental health – moderately strong, and in the remaining 3 cases – weak (Table 2).

It was also analysed whether the presence of comorbidities differentiated the results in terms of quality of life. There were significant differences between the groups in terms of physical functioning (F), pain (P), and physical health. It turned out that in people with comorbidities, the quality of life in terms of these 3 dimensions was lower compared to people without comorbidities. The values of the effect strength coefficient *r* indicate that all these differences were weak (Table 3).

During the analysis, it was also assessed whether alcohol consumption differentiated the results in terms of quality of life. There were significant differences between the groups in all subscales of quality of life. It turned out that alcohol drinkers had higher quality of life scores compared to non-drinkers. The values of the effect strength coefficient *r* indicate that all these differences were mostly weak or moderately strong (Table 4).

A similar analysis was also performed for the variable of smoking. It should be noted, however, that there were no statistically significant differences between the groups. This means that quality of life was similar in smokers compared to non-smokers (Table 5).

Table 1. Distribution of results for the subscales of the quality of life of the study group

Normalized results	Results below normal (< 50%)	Results above normal (> 50%)
Physical functioning (F)	25.0	75.0
Role limitation – physical problems (R)	34.3	65.7
Pain (P)	36.1	63.9
General health (H)	63.9	36.1
Vitality (V)	63.0	37.0
Social functioning (S)	23.1	76.9
Role limitation – emotional problems (E)	47.2	52.8
Well-being (W)	49.1	50.9
Physical health	36.1	63.9
Mental health	31.5	68.5

Table 2. Results of Student's *t*-test for independent trials comparing the average results in terms of quality of life depending on the mode of admission to the hospital of the subjects

Dependent variable	CCS (n = 55)		ACS (n = 53)		<i>t</i>	<i>df</i>	<i>p</i>	95% CI		<i>d</i> Cohen
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>				LL	UL	
Physical functioning (F)	60.36	34.87	89.15	18.13	-5.41 ^a	81.86	< 0.001	-39.37	-18.20	1.03
Role limitation – physical problems (R)	49.66	28.40	60.61	26.28	-2.08	106	0.040	-21.40	-0.51	0.40
Pain (P)	59.44	28.22	67.21	22.71	-1.57	106	0.119	-17.56	2.02	0.30
General health (H)	35.02	23.78	45.30	24.37	-2.22	106	0.029	-19.47	-1.10	0.43
Vitality (V)	34.09	23.35	46.58	19.97	-2.98	106	0.004	-20.79	-4.19	0.57
Social functioning (S)	60.00	30.37	68.63	27.69	-1.54	106	0.126	-19.73	2.47	0.30
Role limitation – emotional problems (E)	50.45	31.40	66.04	26.29	-2.79	106	0.006	-26.65	-4.51	0.54
Well-being (W)	49.09	23.67	60.00	21.79	-2.49	106	0.014	-19.60	-2.22	0.48
Physical health	49.95	23.58	65.62	18.62	-3.82	106	< 0.001	-23.80	-7.55	0.74
Mental health	46.66	20.61	58.69	19.15	-3.14	106	0.002	-19.63	-4.44	0.60

The result of Levene's test turned out to be statistically significant – the result with Welch's correction was reported.

Table 3. The results of the Mann-Whitney *U* test comparing the average results in terms of quality of life depending on the presence of comorbidities among the respondents

Dependent variable	No (n = 8)			Yes (n = 100)			<i>Z</i>	<i>p</i>	<i>r_g</i>
	Average rank	<i>M</i>	<i>SD</i>	Average rank	<i>M</i>	<i>SD</i>			
Physical functioning (F)	81.19	96.88	4.58	52.37	72.70	31.88	-2.55	0.011	0.25
Role limitation – physical problems (R)	69.50	71.09	32.03	53.30	53.75	27.21	-1.42	0.157	0.14
Pain (P)	81.69	84.25	15.43	52.33	61.57	25.81	-2.57	0.010	0.25
General health (H)	70.06	50.88	22.69	53.26	39.20	24.55	-1.46	0.143	0.14
Vitality (V)	59.25	44.53	25.54	54.12	39.88	22.40	-0.45	0.655	0.04
Social functioning (S)	52.81	62.50	28.35	54.64	64.38	29.48	-0.16	0.872	0.02
Role limitation – emotional problems (E)	71.38	73.96	23.33	53.15	56.83	30.11	-1.60	0.110	0.15
Well-being (W)	53.06	53.75	16.20	54.62	54.50	23.85	-0.14	0.892	0.01
Physical health	78.88	74.77	15.08	52.55	56.27	22.60	-2.29	0.022	0.22
Mental health	60.56	56.70	14.34	54.02	52.23	21.16	-0.57	0.569	0.05

r_g – the rank coefficient of the Glass biserial correlation

Table 4. The results of the Mann-Whitney *U* comparing the average results in terms of quality of life depending on alcohol consumption by the respondents

Dependent variable	No (n = 43)			Yes (n = 65)			<i>Z</i>	<i>p</i>	<i>r</i>
	Average rank	<i>M</i>	<i>SD</i>	Average rank	<i>M</i>	<i>SD</i>			
Physical functioning (F)	37.29	56.74	36.69	65.88	86.23	20.18	-4.72	< 0.001	0.45
Role limitation – physical problems (R)	39.00	39.83	27.38	64.75	65.10	23.28	-4.21	< 0.001	0.40
Pain (P)	42.72	53.67	26.84	62.29	69.58	23.26	-3.21	0.001	0.31
General health (H)	43.35	31.07	21.19	61.88	46.02	24.88	-3.02	0.003	0.29
Vitality (V)	43.85	32.41	22.25	61.55	45.38	21.37	-2.89	0.004	0.28
Social functioning (S)	40.26	50.00	31.58	63.92	73.65	23.50	-3.91	< 0.001	0.38
Role limitation – emotional problems (E)	42.56	46.51	28.54	62.40	65.77	28.49	-3.25	0.001	0.31
Well-being (W)	47.03	48.84	22.59	59.44	58.15	23.21	-2.02	0.043	0.19
Physical health	37.51	44.40	23.55	65.74	66.40	17.17	-4.58	< 0.001	0.44
Mental health	41.57	43.81	19.71	63.05	58.35	19.42	-3.49	< 0.001	0.34

Table 5. The results of the Mann-Whitney *U* test comparing the average results in terms of quality of life depending on the smoking of cigarettes by the respondents

Dependent variable	No (<i>n</i> = 37)			Yes (<i>n</i> = 71)			<i>Z</i>	<i>p</i>	<i>r</i>
	Average rank	<i>M</i>	<i>SD</i>	Average rank	<i>M</i>	<i>SD</i>			
Physical functioning (F)	47.89	69.32	31.23	57.94	77.18	31.28	-1.61	0.107	0.15
Role limitation – physical problems (R)	54.18	54.56	26.13	54.67	55.28	28.81	-0.08	0.938	< 0.01
Pain (P)	53.77	62.78	23.93	54.88	63.49	26.94	-0.18	0.860	0.02
General health (H)	59.66	44.30	24.12	51.81	37.86	24.59	-1.24	0.215	0.12
Vitality (V)	58.00	42.40	21.76	52.68	39.08	23.02	-0.84	0.400	0.08
Social functioning (S)	56.77	66.22	29.15	53.32	63.20	29.50	-0.55	0.581	0.05
Role limitation – emotional problems (E)	51.84	56.76	28.32	55.89	58.80	30.89	-0.64	0.520	0.06
Well-being (W)	51.28	51.89	21.93	56.18	55.77	24.05	-0.77	0.440	0.07
Physical health	51.96	57.17	21.30	55.82	57.88	23.40	-0.61	0.543	0.06
Mental health	53.82	52.27	20.64	54.85	52.72	20.90	-0.16	0.871	0.02

Table 6. Correlation between the quality of life and the frequency of alcoholic beverage consumption and the number of cigarettes smoked by the respondents

Variable	Frequency of consumption of alcoholic beverages		Number of cigarettes smoked per day	
	Spearman's rho	Significance	Spearman's rho	Significance
Physical functioning (F)	0.45	< 0.001	0.07	0.486
Role limitation – physical problems (R)	0.38	< 0.001	-0.05	0.634
Pain (P)	0.28	0.004	0.01	0.882
General health (H)	0.27	0.004	-0.20	0.042
Vitality (V)	0.25	0.010	-0.12	0.225
Social functioning (S)	0.38	< 0.001	-0.07	0.461
Role limitation – emotional problems (E)	0.34	< 0.001	0.02	0.870
Well-being (W)	0.20	0.035	0.02	0.869
Physical health	0.43	< 0.001	-0.04	0.685
Mental health	0.34	< 0.001	-0.04	0.670

In the last part of the analysis, it was checked whether the frequency of alcohol consumption and cigarette smoking was related to the quality-of-life subscales. For both variables, the scores were coded so that a high score indicated a higher severity of the variable (higher frequency/quantity). The analysis showed statistically significant relationships between the frequency of alcohol consumption and all subscales of the quality of life. All these associations

were positive, meaning that the higher the frequency of alcohol consumption, the higher the quality of life. These correlations were usually moderately strong or weak. In the case of cigarette smoking, one statistically significant correlation was obtained – with general health (H), and it was negative. This means that the greater the number of cigarettes smoked, the lower the quality of life in this dimension. At the same time, this correlation was very weak (Table 6).

DISCUSSION

The sense of satisfaction that a person experiences is a subjective assessment of the quality of life, and it affects various spheres of life such as physical, mental, social and religious. Therefore, it is an important factor when assessing the health of patients [11]. The aim of the study was to assess the quality of life of patients with coronary artery disease after coronary interventions, and whether selected independent variables improve or deteriorate the quality of life.

Based on our own study, it appears that, in the study group of patients, the results indicating better health concerned the following SF-36 subscales: social and physical functioning, while worse health concerned general health and vitality. In the work by Chatzinikolaou *et al.*, the SF-36 scale was used to assess the quality of life of Greek patients suffering from cardiovascular diseases. The authors showed that the study participants indicated higher values in the pain subscale. On the other hand, lower values were recorded for general health, which is consistent with the finding obtained in the author's study [12]. The obtained results prove the effectiveness of the PCI method in the treatment of coronary artery disease in terms of social and physical health.

Our study shows that patients with ACS after PCI achieve better results in terms of quality of life compared to people with a diagnosis of CCS, except for the pain and social functioning subscales, which turned out to be statistically insignificant. Tsoulou *et al.* in their study presented the level of quality of life before PCI, and 6 and 12 months after interventional treatment. There was a gradual increase in scores over time on the SF-36 subscales of physical functioning, physical limitations, emotional problems, and social functioning. In their work, the authors did not characterize the study group in terms of the main diagnosis [13]. The study by Mościcka *et al.* emphasized that the overall results indicate an improvement in the quality of life of patients treated invasively 4 months after PCI, especially in terms of physical health (angina) [14]. The results obtained in the study compare the quality of life between the 2 groups of patients and confirm the better quality of life of patients after ACS who underwent PCI. The result may be of use to doctors and medical specialists in making therapeutic decisions, planning patient care, and in educating patients about the expected benefits after intervention procedures. Based on our own results, it can be concluded that patients with comorbidities have a lower quality of life in terms of physical functioning, physical health, and pain compared to patients without diagnosed comorbidities. This finding is partly consistent with the results of Assari *et al.*, who showed worse functioning and quality of life among patients

with multimorbidity in all aspects of the SF-36 scale [15]. The result indicates a negative impact of comorbidities on the quality of life of patients with coronary artery disease after PCI. Additionally, for patients with comorbidities, the focus should be on improving physical function and physical health.

Surprising results have been obtained examining the relationship between alcohol consumption and quality of life in patients after PCI. According to the study, patients who consumed alcohol were characterized by higher quality-of-life scores compared to the group of patients who indicated abstinence. In addition, the analysis showed that in the study group, the more often alcohol was consumed, the higher the quality of life was in all subscales of the SF-36. The result is inconsistent with current scientific reports. The literature indicates the negative impact of alcohol consumption among patients at cardiovascular risk [4]. In the study by Kraemer *et al.*, a moderate improvement in the quality of life and fewer negative alcohol-related consequences were obtained in abstainers compared to alcohol drinkers who did not maintain a limit [16]. However, the study by Chan *et al.* showed that regular alcohol consumption was associated with a better quality of life in people over 50 years of age [17]. The result obtained in this study may be associated with moderate alcohol consumption by patients over a long period of time, recognizing its beneficial effects on the heart (i.e. consuming 1-2 standard units per day, especially in the form of red wine, due to its polyphenol content, which, according to some scientific reports, reduces the risk of cardiovascular events) and difficulties in limiting it, in accordance with the recommendations to consumption after PCI. However, the survey did not ask respondents about the type of alcohol they drank (beer, wine, vodka) or its amount per standard unit. There is a need for further research and analysis to better understand the relationship between alcohol consumption (quantity, frequency, type) and quality of life in patients with coronary artery disease after PCI. We must not jump to the conclusion that drinking alcohol can improve the quality of life for everyone. Our study showed that the quality of life of patients who smoke cigarettes is not statistically significantly different in comparison to patients who do not smoke cigarettes. On the other hand, the higher the frequency of smoking, the lower the quality of life, but only in the subscale of SF-36 concerning general health. This correlation was characterized by a very weak strength. Chan *et al.* showed that smokers have a lower quality of life than non-smokers in 6 subscales, apart from pain and social functioning [17]. Although the result does not clearly indicate the impact of smoking on quality of life, it may be important to introduce support and education programs to reduce the incidence of smoking and improve overall health.

In conclusion, this study provides information on the impact of an invasive procedure such as PCI on patients' quality of life. Knowledge can help medical professionals to better monitor and evaluate the effectiveness of invasive procedures. It can contribute to a better understanding of the factors affecting quality of life and enable a more targeted approach by physicians in comprehensive patient care.

STUDY LIMITATIONS

In addition to the advantages mentioned above, this study has some limitations. It was conducted in one hospital in Krakow, Poland, and the trial was convenient, which means that specific patients were selected for the study, so the results cannot be generalized to the entire population of Polish PCI patients. The sample size was small, although it is assumed that the sample size for meaningful results should be 100. Although limited by the short duration of the 3-month study, the results still give valuable information on the issue under consideration and underline the need for more research to draw reliable conclusions. Finally, only selected factors/variables were examined. Others that also have an impact on quality of life were not included, such as current medical conditions, weight, body mass index (BMI), cardiac rehabilitation, mental health status, psychosocial support, and more. The work may be an inspiration for other researchers to explore unanalysed variables.

CONCLUSIONS

Patients after PCI showed better social and physical health but worse general health, pain perception, and vitality.

Patients with ACS admitted urgently showed better results in terms of quality of life after PCI compared to patients with ACS admitted electively.

The study group of patients with comorbidities showed a lower quality of life in terms of physical functioning, physical health, and pain perception compared to patients without diagnosed comorbidities.

Among the examined patients, selected elements of lifestyle (alcohol consumption, smoking) had a varied relationship with their quality of life, which requires further research.

Disclosure

The authors declare no conflict of interest.

References

- Gil RJ, Dudek D. *Ostre zespoły wieńcowe. Możliwości diagnostyczne i terapeutyczne*. Wydawnictwo Termedia, Poznań 2015.
- Zafari MA, Abdou MH. Myocardial infarction [Internet]. Medscape, New York 2015 (cited 2022 December 26). Available from: <https://emedicine.medscape.com/article/155919-overview>
- Diseases and Injuries Collaborators: Global burden of 87 risk factors in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet* 2020; 396: 1223-1249.
- Centrala Narodowego Funduszu Zdrowia: NFZ o zdrowiu. *Choroba niedokrwienna serca*. Departament Analiz i Innowacji Narodowego Funduszu Zdrowia, Warszawa 2020.
- Szczeklik A, Gajewski P (Eds.). *Interna Szczeklika 2021/22*. 12th ed. Medycyna Praktyczna, Kraków 2021.
- Knuuti J, Wijns W, Saraste A, et al. ESC Scientific Document Group: 2019 ESC Guidelines for the diagnosis and management of chronic coronary syndromes. *Eur Heart J* 2020; 41: 407-477.
- Zięba M, Cisoń-Apanasewicz U. Jakość życia w naukach medycznych. *Pielęgniarstwo w Opiece Długoterminowej* 2017; 3: 57-62.
- World Health Organization. WHOQOL: Measuring Quality of Life. [Internet]. 2012 (cited 2023 February 14). Available from: <https://www.who.int/tools/whoqol>
- Strzyżewska M, Krupienicz A. Zmiana jakości życia pacjentów ze stabilną chorobą wieńcową leczonych przezskórną angioplastyką tętnic wieńcowych w rocznej obserwacji. *Medycyna Ogólna i Nauki o Zdrowiu* 2015; 21: 357-361.
- Turska W, Skowron A. *Metodyka oceny jakości życia*. Farmacja Polska 2009; 65: 572-580.
- Zysnarska M, Jarmuż L, Kara I, et al. Wybory w zakresie zachowań zdrowotnych dokonywane przez pacjentów po przebytym zawale mięśnia sercowego. *Problemy Higieny i Epidemiologii* 2014; 95: 488-490.
- Chatzinikolaou A, Tzikas S, Lavdaniti M. Assessment of quality of life in patients with cardiovascular disease using the SF-36, MacNew, and EQ-5D-5L questionnaires. *Cureus* 2021; 13: 1-16.
- Tsouliou V, Vasilopoulos G, Kapadochos T, et al. Quality of life in patients undergoing percutaneous coronary intervention. *Clin Pract* 2023; 13: 621-637.
- Mościcka S, Wójcik DL, Mamczarz A. Jakość życia w chorobie niedokrwiennej serca. *Choroby Serca i Naczyń* 2015; 12: 282-288.
- Assari S, Moghani Lankarani M, Ahmadi K. Comorbidity influences multiple aspects of well-being of patients with ischemic heart disease. *Int Cardiovasc Res J* 2013; 7: 118-123.
- Kraemer KL, Maisto SA, Conigliaro J, et al. Decreased alcohol consumption in outpatient drinkers is associated with improved quality of life and fewer alcohol-related consequences. *J Gen Intern Med* 2002; 17: 382-386.
- Chan AM, von Mühlen D, Kritz-Silverstein D, et al. Regular alcohol consumption is associated with increasing quality of life and mood in older men and women: The Rancho Bernardo Study. *Maturitas* 2009; 62: 294-300.