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Quality of life and health behaviors of patients diagnosed with cardiovascular disease[1]

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Abstract: *Background:* Cardiovascular diseases are the leading cause of death, both in Poland and worldwide, significantly impacting patients' quality of life. Health behaviors, whether positive or negative, play a crucial role in influencing the incidence of cardiovascular diseases. This study aims to analyze the correlation between health behaviors and the quality of life among patients with cardiovascular diseases. *Materials and Methods:* The study was conducted among 120 patients (116 eligible) at the Independent Public Provincial Hospital in Poland. Standardized tools including the Health-Related Behavior Inventory (HBI) questionnaire developed by Zygfryd Juczyński, the WHOQOL-BREF Questionnaire, and an original questionnaire with metric data were employed for diagnostic survey. Statistical analysis was performed using the Statistica 10.0 program, with a significance level set at $p \leq 0.05$. *Results:* The respondents' average HBI score was 5.09, while the average overall quality of life score was 3.42, and the average overall health score in the study group was 3.07. Statistically significant correlations were observed between health practices and the assessment of general health, the general index of health behaviors and the level of quality of life in the physical domain, as well as positive mental attitude and quality of life in the psychological domain. Lower quality of life and poorer health status among patients with cardiovascular diseases were associated with increased preventive behaviors and intensified health practices. *Conclusions:* Despite having a good quality of life on average, individuals with cardiovascular diseases demonstrated moderate health behavior scores. The coexistence of lower quality of life and poorer health status with intensified preventive activities and health behaviors suggests a need for support in mental functioning, as well as adequate education and motivation regarding diet and eating habits. Moreover, it's essential to utilize appropriate techniques to motivate patients to adopt healthier behaviors.
Keywords: cardiovascular disease, health behavior, quality of life

Introduction

Diseases of the cardiovascular system, often categorized as civilization diseases, remain a prominent challenge in healthcare, despite advancements in diagnostics and the availability of modern treatment methods (Lacombe, Armstrong, Wright, & Foster, 2019; Soltani et al., 2021; Woodward, 2019). Epidemiological data consistently identify them as the leading cause of hospitalization and mortality in the population, comprising 34.8% of deaths according to the National Institute of Public Health PZH–National Research Institute (Wojtyniak & Madej, 2021; Łagoda et al., 2020, Szukalski, 2021). Characterized by an insidious, chronic nature, cardiovascular diseases pose a con-

1 Article in polish language: https://www.stowarzyszeniefidesetratio.pl/fer/59P_Pawl.pdf

tinual threat to the patient's life and well-being, marked by periods of symptom exacerbation and remission (Baigent et al., 2022; Padro et al., 2020, Sharifi-Rad et al., 2020).

These conditions profoundly impact human body function, leading to a diminished quality of life, potential work absenteeism, or disability. When evaluating quality of life, it's essential to consider both objective determinants (such as performance metrics) and subjective determinants (like health behaviors) (Bahall, Legall, & Khan, 2020; Broers et al., 2020; Kanejima i in, 2022; Mensah, Roth, & Fuster, 2019).

Modern lifestyle intensity, civilization's progress, inadequate dietary habits, sedentary living, and stress contribute significantly to cardiovascular disease development. These factors, termed modifiable risk factors, play a pivotal role in disease incidence and are primarily categorized as negative health behaviors. Various variables influence their manifestation in individuals, including education and health literacy, social environment, living conditions, healthcare accessibility, mental well-being, primary and secondary support systems, mass media influence, and the extent of healthy lifestyle promotion (Barbaresko, Rienks, & Nöthlings, 2018; Bonner, Fajardo, Doust, McCaffery, & Trevena, 2019; Cowie et al., 2019; Díaz-Gutiérrez, Ruiz-Canela, Gea, Fernández-Montero, & Martínez-González, 2018; Timmis et al., 2022; Zhang et al., 2021).

The objective of this study is to examine the connections between health behaviors and the quality of life among individuals diagnosed with cardiovascular diseases.

1. Material and methods

The study was conducted using: a questionnaire, the Health Behaviour Inventory (HCI) by Zygfryd Juczyński and the WHOQOL BREF Questionnaire. The questionnaire asked for basic socio-demographic data along with clinical data such as duration of underlying disease and number of hospitalisations.

The Health-Related Behavior Inventory comprises 24 statements describing health behaviors across four categories: proper eating habits, preventive behaviors, health practices, and positive mental attitude. Participants rated each statement on a 5-point Likert scale, with the overall score indicating the intensity of health behaviors, ranging from 24 to 120 points – higher scores denoting greater engagement in health-promoting behaviors. Additionally, raw scores were transformed into standardized sten norms: 1-4 sten indicating low results, 5-6 sten representing average results, and 7-10 sten reflecting high results (Baumgart, Weber-Rajek, Radzimińska, Goch, & Zukow, 2015; Juczyński, 1999, 2012).

The WHOQOL-BREF questionnaire comprises 26 questions, facilitating the assessment of quality of life across four domains: physical, psychological, social, and environmental. It also includes two separate questions assessing the individual's general perception of their overall quality of life and health status (Skevington, Lotfy, & O'Connell, 2004; Vahedi, 2010).

The study was conducted at the Independent Public Provincial Specialist Hospital in Chełm from February to April 2023. Respondents were assured of their anonymity in accordance with the Act of May 10, 2018, on the protection of personal data (Journal of Laws 2018, item 100). Due to significant missing data or incorrectly completed questionnaires, four questionnaires were excluded, leaving 116 for further analysis.

Data management and statistical analyses were performed using IBM SPSS Statistics 27 software. Descriptive statistics including means, medians, minimum and maximum values, standard deviations, counts, and percentages were used to present quantitative and qualitative variables. Depending on variable distribution and number, tests such as Student's t-test, Mann-Whitney test, and Kruskal-Wallis test were applied. Relationships between variables were explored using Spearman's rho correlation coefficient, with a significance level set at $p \leq 0.05$.

2. Characteristics of the study group

The study encompassed a cohort of 120 patients from the cardiology ward, with 116 eligible respondents included in the analysis, all of whom accurately completed the questionnaires along with providing metric data.

Upon analyzing the demographic diversity, it was observed that the majority of respondents were women, comprising 56% of the study group, while men constituted 44%. Regarding age distribution, the largest proportion fell within the 41 to 60 age bracket (40.5%), followed by those over 60 (31.0%), with individuals under 40 representing the smallest percentage at 28.4%. More than half of the respondents (51.7%) resided in urban areas, while the remaining 48.3% lived in rural settings. The surveyed group was predominantly employed, comprising 65.5% of all participants, while 34.5% were unemployed. In terms of education, 38.8% held secondary education qualifications, 34.5% had vocational education or lower, and 26.7% possessed higher education degrees. The majority of respondents (48.3%) rated their financial status as average, while 46.6% described it as good, and 5.2% reported a poor financial situation. Clinical data are presented in Charts 1 and 2.

Statistical analysis revealed no significant differences in gender ($\chi^2 = 1.690$; $p = 0.194$), age ($\chi^2 = 2.810$; $p = 0.245$), place of residence ($\chi^2 = 0.138$; $p = 0.710$), or education ($\chi^2 = 2.603$; $p = 0.272$) among the respondent categories. However, significant differences were found in professional activity ($\chi^2 = 11.172$; $p = 0.001$), financial situation ($\chi^2 = 41.448$; $p = 0.001$), duration of illness ($\chi^2 = 6.534$; $p = 0.038$), and number of hospitalizations ($\chi^2 = 7.879$; $p = 0.019$).

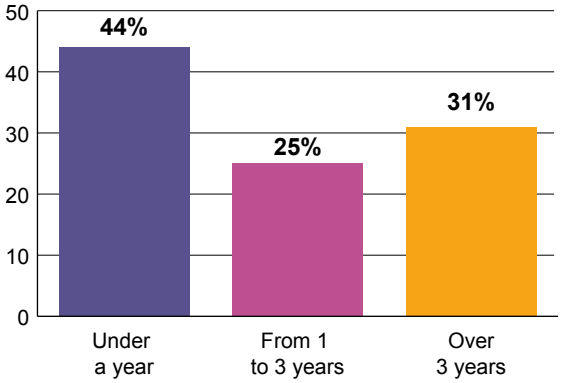

Chart 1. The diversity of respondent depending on the duration of the disease.

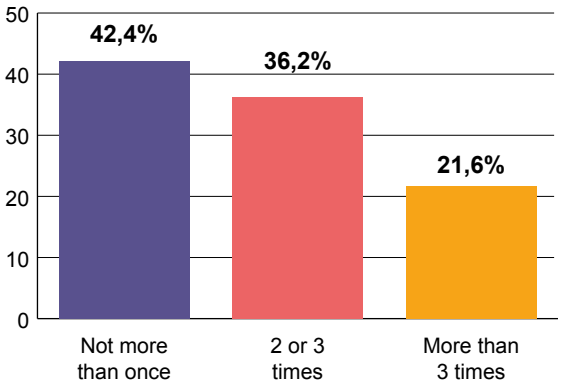

Chart 2. Diversity of respondents due to the number of hospitalization.

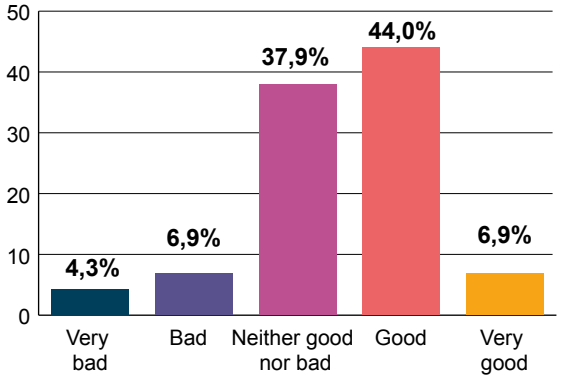

Chart 3. Variation in the overall assessment of the quality of life of the surveyed group.

3. Results

The aggregate result of the Health-Related Behavior Inventory (HBI) questionnaire for the entire study group yielded a sten score of 5.09, indicating an average level of health behaviors, as per the author's

Table 1. Level of health behaviors of surveyed individuals

The Health – Related Behavior Inventory	M	SD	Me	Min	Max	Standardization group results*
HBI-Sten	5.09	2.02	5.0	1.00	10.00	-
Proper eating habits	3.01	0.77	3.0	1.33	4.67	3.13
Preventive behavior	3.16	0.71	3.17	1.33	4.83	3.45
Positive mental attitude	3.36	0.68	3.33	1.50	4.83	3.53
Health practices	3.11	0.75	3.17	1.00	4.67	3.21

Legend: M–mean, SD–standard deviation, Me–median, Min–minimum value, Max–maximum value.
* Standardization group results based on *Narzędzia pomiaru w psychologii i promocji zdrowia* (Measurement tools in psychology and health promotion), (after: Juczyński, 1999, 2012).

Table 2. Variation in the assessment of the general health of the people surveyed

Rating	N	%
Very dissatisfied	7	6.0
Dissatisfied	25	21.6
Neither satisfied nor dissatisfied	42	36.2
Satisfied	37	31.9
Very satisfied	5	4.3
In total	116	100.0

χ^2 = 49.172; p=0.001
Legend: N - size of the sample population, % - percentage of respondents.

interpretation. A breakdown of respondents' results across individual categories of health behaviors is provided in Table 1. Upon analyzing the questionnaire results after conversion to the sten scale, a statistically significant difference was observed in the low level of health behaviors within the study group (p = 0.023). Specifically, 43.1% of participants obtained average results, falling within the 5-6 sten range. Meanwhile, 34.5% of respondents exhibited a low level of health behaviors (1-4 sten), while 22.4% demonstrated a high level of health behaviors (7 or higher sten).

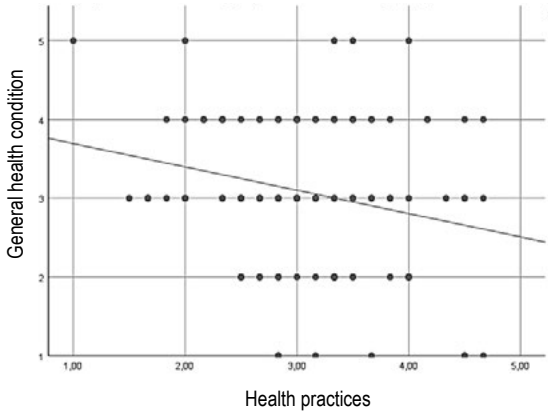

Chart 4. Relationships between assessmbeandtaonfygcehnzeeral health and health practices. Scatter plot.

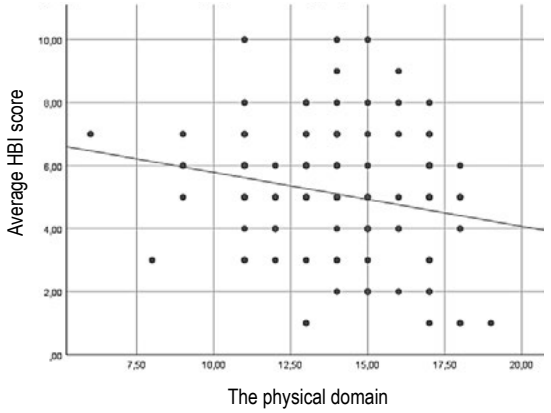

Chart 5. Relationships between the general index of fealth behaviors and the quality of life in the physical domain. Scatterplot.

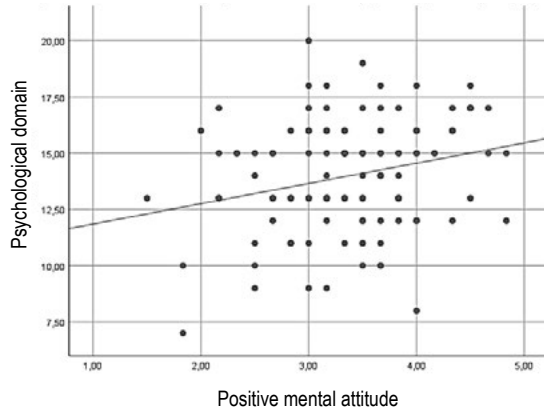

Chart 6. Relationships between positive mental attitude and quality of life in the psychological domain. Scatter plot.

The mean score for the overall quality of life assessment in the study group was M = 3.42, with a standard deviation of SD = 0.89 points. The range of scores varied from a minimum of 1 to a maximum of 5, with a median of Me = 4.0. This indicates that half of the respondents scored 4 or lower, while the other half scored 4 or higher (Chart 3). Among the domains of quality of life, participants reported the highest levels of satisfaction in the social domain, with a mean score of M = 14.78 and a standard deviation of SD = 3.20, followed by the environmental domain, with a mean score of M = 14.29 and SD = 2.24, and the physical domain, with a mean score of M = 14.09 and SD = 2.49. Conversely, respondents reported the lowest quality of life in the psychological domain, where the average score for the entire study group was M = 13.98, with a standard deviation of SD = 2.48.

The average assessment of the general health condition in the study group was M = 3.07, and the value of the standard deviation, SD = 0.98. The minimum score is 1 and the maximum is 5. The median value was 3 points. The differences in the assessment of the general health condition of the surveyed group are presented in Table 2.

Upon analyzing the relationship between health behaviors and the overall assessment of quality of life, as well as the assessment of general health, a statistically significant correlation (p = 0.045) was observed only between the category of health behaviors labeled „health practices" and the assessment of respondents' general health. This correlation was negative, with a very weak strength (rho = -0.187). This negative correlation indicates that as the value of one variable increases, the value of the other variable decreases. In other words, the better respondents assessed their general health condition, the less emphasis they placed on health practices, as depicted in Chart 4.

Upon analyzing the relationship between health behaviors and quality of life, a statistically significant correlation (p = 0.024) was found between the general index of health behaviors and the level of quality of life in the physical domain. This correlation was negative, with a weak strength (rho = -0.209), indicating that as the value of the general health behavior index increased, the level of quality of life in the physical domain decreased, as illustrated in Chart 5. Furthermore, quality of life in the physical domain also exhibited statistically significant correlations with preventive behaviors (p = 0.034, rho = -0.198) and health practices (p = 0.009, rho = -0.240). Again, these correlations were negative, with very weak strengths, signifying that as the level of preventive behaviors and health practices increased, the quality of life in the physical domain decreased.

Statistically significant correlation (p = 0.017) was observed only between positive mental attitude and quality of life in the psychological domain. This correlation was positive with a weak relationship strength (rho = 0.221). This indicates that as the positive attitude towards life increased, the quality of life in the psychological domain also increased. This relationship is depicted in Chart 5.

4. Discussion

Analyzing the results of the questionnaire after conversion to the sten scale revealed statistically significant differences in the level of health behaviors within the study group. In a study conducted by Szkup et al., involving 132 patients undergoing cardiac surgery and staying in various cardiology wards, the average overall result of the health behavior index was at an average level, consistent with the findings of the present study. When examining the individual categories of health behaviors included in the Health-Related Behavior Inventory (HBI), the authors noted that patients undergoing cardiac surgery scored highest in the category of positive mental attitude (mean = 3.90) and lowest in the category of proper eating habits (mean = 3.49) (Szkup, Starczewska, Skotnicka, Jurczak, & Grochans, 2014). Similarly, in our study, respondents also obtained the highest average score in the category of health behaviors related to mental attitude, albeit lower than that reported by Szkup et al. Conversely, the lowest average score was observed in health behaviors concerning proper eating habits. Analogous relationships were shown by Babiarczyk and Małutowska-Dudek (2016) in a group of hospitalised patients with hypertension and by Schneider-Matyka et al. (2015) in a group of subjects with diagnosed cardiovascular disease.

These findings suggest that a positive mental attitude is a strength among patients with cardiovascular diseases, while aspects related to diet and eating habits may necessitate intensified educational interventions.

In our study, the average level of quality of life among patients with cardiovascular diseases was determined to be 3.43 out of a possible 5 points. A study by Klarkowska and Antczak (2017), including 100 patients diagnosed with hypertension, showed that the mean quality of life score was - 3.67 points. The results of the analyses suggest that the level of quality of life of patients with cardiovascular disease is declared as good.

In our own study, more than half of the respondents rated their quality of life as good or very good.

However, in a study by Paplaczyk, Gawor, and Ciura (2015) on a group of 105 patients with ischemic disease of the lower limbs, most respondents rated their general quality of life as neither good nor bad (36.10%) or as poor (33.33%). Notably, none of the respondents rated their quality of life as very good. These discrepancies may arise from differences in the pathophysiology of the underlying diseases among participants, as well as the pain, functional limitations, reduced mobility, and self-care challenges associated with the diseases.

The impact of health behaviors on the quality of life among individuals with heart failure was investigated by Kurowska and Kudas (2013), who demonstrated that as the intensity of health practices increased, the quality of life of the respondents also improved.

In our study, although no statistically significant relationship was found between the general index of health behaviors and the overall assessment of quality of life, an association was observed between the intensity of health behaviors and lower quality of life among patients with cardiovascular diseases in the physical domain. Similarly, heightened preventive behaviors among respondents were correlated with decreased quality of life in this domain.

Moreover, it was revealed that lower quality of life in the physical domain was linked to an increase in the intensity of health practices. However, an increase in health behaviors associated with a positive mental attitude corresponded to an improved level of quality of life in the psychological domain. Surprisingly, correct eating habits did not significantly affect either the overall assessment of quality of life or its various domains. The category of preventive behaviors specified in the HBI encompasses activities such as adherence to medical recommendations, regular medical check-ups, and seeking information about disease prevention. These activities require considerable effort and may drain energy, potentially impacting the physical sphere of quality of life, which is closely related to fatigue and mobility. These findings suggest a hypothesis: individuals who rate their quality of life lower in the physical domain might intensify preventive behaviors out of fear of worsening their health. This could include increasing rest, prioritizing sleep, managing weight, and avoiding smoking as part of their preventive measures.

It's clear that adopting health-seeking behavior often demands lifestyle changes, which can be challenging and may lead to temporary adverse physical or psychological symptoms, like nicotine withdrawal syndrome. Numerous studies have highlighted that a majority of cardiac patients revert to smoking even after completing cardiac rehabilitation programs (Sadeghi et al., 2021). Therefore, the way of motivating patients to change and to maintain it through appropriate behavioral changing techniques that effect self-regulation (An & Song, 2020), health coaching including motivational interviewing (Sokalski, Hayden, Raffin Bouchal, Singh, & King-Shier, 2020; Suls et al., 2020), promoting eHealth literacy (Lin et al., 2020), family support seems to be very important and psychological support for patients at every stage of change (Moradi et al., 2020).

Conclusions

1. Patients with cardiovascular diseases exhibit an average level of health behavior.
2. The quality of life among patients with cardiovascular diseases is generally good.
3. Patients with cardiovascular diseases prefer health behaviors in terms of a positive mental attitude.
4. The activities of medical staff regarding dietary education and the promotion of proper eating habits should be intensified.

5. Patients with cardiovascular diseases need psychological care and mental support in coping with the limitations resulting from the underlying disease.
6. The lower quality of life and poorer health status of patients with cardiovascular disease lead to an increased interest in preventive behaviour and the strengthening of health-promoting practices. Attention should be paid to using appropriate techniques to motivate patients to change their health behaviours and to providing psychological support at each stage of behaviour change.

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