Socio-demographic and medical determinants of the quality of life in patients after myocardial infarction

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Socio-demographic and medical determinants of the quality of life in patients after myocardial infarction

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	abstract
Background	Quality of life is a multi-dimensional concept reflecting various aspects of human activity. The aim of the study was to analyse an effect of selected socio-demographic and medical factors on the quality of life of patients after myocardial infarction.
Material/Methods	The study group consisted of 80 people, aged from 41 to 85, treated for myocardial infarction in medical entities in Mława (Poland) in the first half of 2014. The study used the SF-36v2 questionnaire.
Results	In analysis of the quality of life, the value of the mean domain of physical health was 52.6 ±11.35, whereas in the domain of mental health, it was substantially lower, i.e. 37.6 ±5.60. It was found that sex ($p = 0.03$), age ($p = 0.0006$), education ($p = 0.003$), recognized disability ($p = 0.0001$), and support from the family and friends ($p = 0.01$) have a significant effect on the quality of life in the physical domain. Such variables as: age ($p = 0.006$), education ($p = 0.03$), duration of illness ($p = 0.03$), undergoing check-ups ($p = 0.001$), blood pressure control ($p = 0.00001$), received support from the family and friends ($p = 0.0005$) significantly determine the level of the quality of life with respect to mental health.
Conclusions	A lower quality of patients' life is observed in the psychological domain than in the physical one.
Key words	myocardial infarction, quality of life

INTRODUCTION

Quality of life is a multi-dimensional concept variously interpreted by many researchers. On the basis of medicine, researchers attempt to unify the concept in this field of science in the form of "the quality of life conditioned by the state of health" – HRQoL. It is defined as a "functional effects of the disease and its treatment received (experienced) by the patient" [1, 2]. "Quality of life conditioned by the state of health" implies that a sense of health is one of the basic factors of the quality of life [2, 3, 4]. It covers four areas: physical and motor skills, mental state, social and economic conditions, somatic sensations [1, 2]. As indicated by Siegrist, research on the quality of life in medicine primarily shows the patient's point of view, which may differ from the one presented by clinicians, as they are a source of important information that could play a significant role in making therapeutic decisions, and importantly – call for patient care outside hospital [5, 6]. Many researchers indicate that expectations faced by modern medicine concern not only treatments or a possibility to extend patients' lives, but also an improvement in the multifactorial aspects of the quality of life dependent on health [7]. The quality of life of people with various diseases of the cardiovascular system is as important as the results of physical examinations, laboratory and clinical studies [7]. Cieslik and Szykowska-Styczyrz believe that "patients with a history of acute coronary syndromes are a specific group, diverse in terms of the severity of the disease, its clinical course, including exercise tolerance and degree of heart failure and pharmacotherapy" [8]. Health-related quality of life in cardiovascular diseases includes aspects such as the definition of the patient's physical, mental and social health and determining the consequences and limitations of the disease, the term functional capacity and the degree of disability, the assessment of health behaviours related to lifestyle, perception of health and self-evaluation, assessment of the rehabilitation process, economic conditions [9]. The subjective feeling of illness does not necessarily correlate with objective (from the medical point of view) health. Each person gets sick in a unique way, and that means that the same disease takes on special significance for the patient in the context of their individual feelings and experiences [10]. In this paper the author attempts to answer the question: "To what extent do socio-demographic and medical factors differentiate the quality of life of patients with myocardial infarction in medical facilities in Mława"? Therefore, analysis of the influence of selected socio-demographic and medical factors on the quality of life of patients with myocardial infarction treated in medical facilities in Mława is the aim of the study.

MATERIAL AND METHODS

The study was conducted in the first half of 2014 on 80 patients treated for myocardial infarction in the Cardiology Clinic and/or the Intensive Care unit of Cardiology SP Health Care Centre in Mława. Patients were informed about the purpose of the study and their rights to confidentiality. Everyone gave their informed consent to participate in the study. The study included 44 (55%) men and 36 (45%) women aged 41 to 85. The most numerous group were patients aged 61–70 (n = 33; 41.25%) and over 70 years of age (n = 26; 32.5%). A high proportion of patients were unmarried 71.25% (n = 57), more than half remained out of retirement (n = 41; 51.25%), 35% (n = 28) were retired. Most of the respondents lived in the city (66.25%; n = 53), and ⅓ (33.75%; n = 33) in the countryside. The largest group consisted of respondents who had myocardial

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infarction 4–5 years before – 25 people (31.25%) and 24 individuals (30.0%) indicated that six years or more passed since. 93.75% of patients had the first myocardial infarction. As many as 81.25% (n = 65) patients reported being treated also for hypertension. The research method used a diagnostic survey. The research tool was made of a questionnaire of our own design, containing basic socio-demographic data and medical research, and for the overall quality of life a standardized questionnaire SF-36v.2 (Medical Outcomes Study 36 – the Short Form) was used. The SF-36v.2 consists of 36 questions that allow evaluating 8 components of the quality of life, such as: physical functioning (PF – physical functioning), restrictions on the performance of social roles due to physical health (RP – role physical), pain (BP – bodily pain), general health perception (GH – general health), vitality (VT – vitality), social functioning (SF – social functioning), activity factors emotional state (RE-role emotional) and mental health (MH – mental health). The first four of these components (PF, RP, BP, GH) are part of the sum scale assessing the domain of physical health (PCS-physical component summary); the other four (VT, SF, RE, MH) form the scale of the total evaluating the domain of mental health (MCS – mental component summary). Answers to particular questions in the questionnaire have values from 0 to 100 points, with zero being the lowest and 100 the highest quality of life. To evaluate the health physical dimension (PCS) totalled four components (PF, RP, BP, VT) assessing physical health, and in the dimension of mental health (MCS) components (SF, RE, MH, GH) assessing mental health [11]. The sum of points for each dimension scaled according to the following formula:

$$ WP = \frac{\Sigma P - min\Sigma P}{max\Sigma P - min\Sigma P} $$

WP – scaled value
ΣP – actual total points
$min\Sigma P$ – minimum total points
$max\Sigma P$ – maximum total points

The collected empirical data was statistically analysed. The influence of sociodemographic variables and health on the quality of life was assessed by SF-36v.2 using non-parametric ANOVA Kruskal–Wallis rank test. The level of significance was at $p < 0.05$.

RESULTS

The average value of the physical health domain (PCS) in the studied group was 52.6 ±11.35 with a median of 54.8, while in the domain of mental health (MCS) it was much lower, at 37.6 ±5.60, with a median of 37.5 (Table 1).

Table 1. Characteristics of physical and mental health domains by SF-36v.2 with respect to the specific quality of life scales (N = 80)

Domains/Scales	M	SD	Min.	Max.	Percentile 10	ME	Percentile 90
PCS – physical health domain	52.60	11.35	30.20	79.40	36.50	54.80	65.10
PF – physical functioning	55.00	27.83	0.00	135.00	20.00	70.00	80.00
RP – role physical	35.90	13.14	0.00	70.00	20.00	40.00	50.00
BP – bodily pain	25.50	24.54	0.00	90.00	0.00	20.00	60.00
GH – general health	62.10	10.45	40.00	90.00	50.00	60.00	75.00
MCS – mental health domain	37.60	5.60	23.20	51.80	30.40	37.50	44.60
VT – vitality	33.50	4.93	25.00	50.00	30.00	30.00	40.00
SF – social functioning	49.10	5.18	37.50	62.50	37.50	50.00	50.00
RE – role emotional	56.60	22.25	0.00	100.00	25.00	58.30	75.00
MH – mental health	28.20	6.57	15.00	40.00	20.00	30.00	35.00

Explanation: N – number, M – arithmetic average, ME – median, SD – standard deviation, Min. – minimum, Max. – maximum

The highest average values in the domain of physical health (PCS) in the study group reached two scales of quality of life: perception of general health (GH) at the level of 62.1 ±10.45 and physical fitness (PF) with a mean of 55.0 ±27.83. The lowest average 25.5 ±24.54 was in the scale of pain (BP). In the domain of mental health (MCS) the average individual scales affecting the quality of life had the following values: activity conditioned emotional state (RE) – 56.6 ±22.25, social functioning (SF) – 49.1 ±5.18, vitality (VT) – 33.5 ±4.93, mental health (MH) – 28.2 ±6.57. Furthermore, we analysed the influence of selected socio-demographic factors and medical evaluation of the level of quality of life of patients after myocardial infarction in the domain of physical activity (PCS), in accordance with the questionnaire SF-36v.2, and the results are presented in Table 2.

Table 2. Impact of the independent variables on the average level of the index in the area of the domain of physical health (PCS)

Physical health domain (PCS)				
Variables	N = 80	M	SD	Level of significance
Sex				H = 4.66
Female	36	49.40	12.35	p = 0.03*
Male	44	55.20	9.86	
Age				
41-50	6	51.10	13.41	H = 17.39
51-60	15	50.50	13.93	p = 0.0006***
61-70	33	58.60	7.28	
71 or greater	26	46.50	10.23	
Place of residence				H = 0.38
country	27	51.40	12.96	p = 0.53
city	53	53.20	10.51	
Education				
elementary	9	40.60	5.84	H=13.72
vocational	37	53.00	11.06	p=0.003***
secondary/college, post-secondary	29	54.10	11.11	
academic	5	62.20	7.05	
Degree of disability N=61				
considerable	23	45.90	9.96	H = 15.33
moderate	38	57.10	9.27	p = 0.0001***
low	-	-	-	
Duration of illness				
7 to 12 months	8	48.80	11.63	H = 2.82
1-3 years	23	54.00	12.51	p = 0.41
4-5 years	25	54.40	10.05	
6 years or longer	24	50.60	11.45	
Performing checkups and the use of medical advice				
yes (systematically)	66	53.60	11.20	H = 2.78
rarely	10	49.20	13.07	p = 0.24
irregularly	4	44.40	3.43	
Blood pressure control				H = 1.67
yes	63	53.60	11.27	p = 0.19
sometimes	17	48.70	11.12	
Support received from family / friends N = 79				H = 9.18
yes (always, systematically)	72	54.00	11.08	p = 0.01*
yes (occasionally)	7	40.10	4.27	

Statistically significant: p < 0.05*; p < 0.01**; p < 0.001***

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The analysis found that gender (p = 0.03), age (p = 0.0006), education (p = 0.003), disability (p = 0.0001) and received support from family/friends (p = 0.01) has a significant impact on the quality of life in the area of physical activity domain (PCS). Men have a statistically significantly (p = 0.03) higher level of quality of life in the area of physical activity domain (PCS) (55.2 ±9.86) than women (49.4 ±12.35). It turned out that the respondents aged 71 and above have a statistically significantly (p = 0.01) lower level of quality of life in the area of physical activity domain (PCS) (46.5 ±10.23) than younger respondents aged 61 to 70 years old (58.6 ±7.28). Respondents' education is another variable having a significant (p=0.003) effect on the differentiation of results in the domain of physical activity (PCS). People with primary education have a lower level of the quality of life than people with vocational education (p = 0.03), secondary/post-secondary education (p = 0.01) and higher (p = 0.001). A high percentage of respondents (76.25%; n = 61) has a degree of disability. People with a moderate degree of disability have a significantly (p = 0.0001) higher level of the quality of life (57.1 ±9.27) in the physical dimension than those with a considerable degree of disability (45.9 ±9.96). In the studied group there were no people with a slight degree of disability. Family/relatives give patients a sense of security and support. Support received by respondents determines their quality of life at the significance level of p=0.01 and is much higher in people who receive always/regularly support (54.0 ±11.08) than in those who receive it occasionally (40.1 ±4.27). Other variables, such as place of residence, duration of illness, regular check-ups and use of medical advice and control of blood pressure do not affect the quality of life in this domain (PCS).

The next step in the research was to understand the extent to which socio-demographic and medical factors differentiate the quality of life in patients after myocardial infarction in the area of mental health domain (MCS). The results are shown in Table 3.

Analysis of the data (Table 3) shows that variables, such as age (p = 0.006), education (p = 0.03), duration of disease (p = 0.03), performing check-ups and the use of medical advice (p = 0.001), control of blood pressure (p = 0.00001), support received from family/friends (p = 0.0005), significantly contribute to the quality of life in the dimension of mental health (MCS). Respondents aged 51 to 60, who can be professionally active, have a statistically significantly (p = 0.02) lower quality of life (35 ±6.14) than those aged 61 to 70 (40.3 ±4.12). It was found that people with elementary education have a significantly lower quality of life than people with secondary/post-secondary (p = 0.04) and higher education (p = 0.02). The duration of illness is an important factor that determines the quality of life in the domain of mental health (MCS). Those who had struggled with the disease for a few months – up to a year had a statistically significantly (p = 0.02) lower average quality of life in the area of mental health domain (MCS) (33 ±4.87) than those who stated that they had had myocardial infarction 4 to 5 years before (39.5 ±4.23). Performing check-ups and the use of medical advice and control of blood pressure is an important factor in the prevention of cardiovascular diseases. People who regularly check their health and systematically benefit from medical consultations have a statistically significantly (p = 0.01) higher average quality of life in the area of mental health domain (MCS) (38.6 ±5.23) than those who rarely do check-ups and rarely use medical advice (32.7 ±4.19). In our

study, it was found that people who regularly monitor blood pressure have a significantly (p = 0.00001) higher level of an average quality of life in the area of mental health (MCS) (38.9 ±5.23) than those who rarely measure their blood pressure (32.8 ±4.19). Those who occasionally receive support from family/friends have a statistically significantly (p = 0.00) lower average quality of life in the area of mental health (MCS) (30.6 ±1.23) than those who regularly/always receive it (38.4 ±5.25). Other variables, such as gender, place of residence, or degree of disability, do not determine the quality of life of patients after myocardial infarction in the dimension of mental health (MCS).

Table 3. Effect of the independent variables on the average level of the index in the area of mental health domain (MCS)

| Variables | Mental health domain (MCS) | | | |
	N = 80	M	SD	Level of significance
Sex				H = 1.59
female	36	36.60	5.54	p =0.20
male	44	38.40	5.56	
Age				
41-50	6	33.60	6.43	H = 12.59
51-60	15	35.00	6.14	p =0.006***
61-70	33	40.30	4.12	
71 or greater	26	36.60	5.45	
Place of residence				H = 0.38
country	27	37.10	6.31	p = 0.53
city	53	37.80	5.24	
Education				
elementary	9	34.50	5.65	H = 9.26
vocational	37	36.70	5.30	p = 0.03*
secondary/college, post-secondary	29	38.90	5.51	
academic	5	41.80	5.14	
Degree of disability N = 61				H = 0.39
considerable	23	37.50	5.75	p = 0.52
moderate	38	38.60	4.85	
low	-	-	-	
Duration of illnes				
7 to 12 months	8	33.00	4.87	H = 9.01
1-3 years	23	36.60	5.67	p = 0.03*
4-5 years	25	39.50	4.23	
6 years or longer	24	38.00	6.22	
Performing checkups and the use of medical advice				
yes (systematically)	66	38.60	5.33	H = 13.69, p = 0.001***
rarely	10	32.70	4.69	
irregularly	4	32.60	2.25	
Blood pressure control				H = 16.58
yes	63	38.90	5.23	p = 0.00001***
sometimes	17	32.80	4.19	
Support received from family / friends N = 79				H = 15.28
yes (always, systematically)	72	38.40	5.25	p = 0.0005***
yes (occasionally)	7	30.60	1.23	

Statistically significant: p < 0.05*; p < 0.01**; p < 0.001***

DISCUSSION

Research results indicate that the average quality of life in the studied group of patients after myocardial infarction was significantly higher in the domain of physical activity (PCS) than in the domain associated with mental activity (MCS). Similar results were obtained in studies conducted by Blaszczyk et al. on 50 patients after myocardial infarction treated in Family Medicine Practice in Wroclaw. The researchers found a lower quality of life among the studied patients, especially in terms of the level of physical activity (PCS). They noted a higher quality of life in the area of physical activity domain (PCS) in women than in men [12]. In our study we observed a different situation. Men had significantly higher levels of the quality of life in the area of physical activity domain (PCS) than women. In the domain of mental health (MCS) there

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were no significant differences between men and women. Other researchers have noted differences between genders in the quality of life of patients with cardiovascular disease. Many studies confirmed a lower quality of life of women compared to the corresponding in age men [13, 14]. In a study conducted by Pałczak and Uchmanowicz on 50 patients after myocardial infarction, there was no significant difference in the self-assessment of quality of life in the field of PCS (p > 0.05) and MCS (p > 0.05) in women and men. On the other hand, we observed a statistically significant negative correlation between the assessment of quality of life made using the SF-36 in the PCS domain and the age group (older people stated a worse quality of life) $rS = -0.395$; $p = 0.006$ [9]. In turn, the research conducted by Żołnierczuk-Kieliszek et al. in a group of 100 patients with cardiovascular disease showed that women achieved worse results than men both in terms of physical health (PCS) and mental health (MCS) and the scales of physical functioning, somatic pain, vitality, emotional role, mental health, but these relationships were statistically insignificant. By contrast, the authors of the study observed a statistically significant negative correlation between the assessment of the quality of life made using the SF-36 in the PCS domain and the time elapsed since myocardial infarction $rS = -0.293$; $p = 0.039$. All groups showed that the duration of illness decreased the quality of life the most in the dimension of comprehensive mental health (MCS) as well as in the areas of social functioning (SF) and mental health (MH) ($p < 0.05$) [15]. Dias et al., analysing the quality of life using the SF-36 questionnaire in a group of 278 patients treated in hospital for acute coronary syndromes found that worse mental health (MCS) in the follow-up was associated with female gender. The values of the level of physical activity (PCS) below the average follow-up also occurred more frequently in women [16].

In our study, patients who had had myocardial infarction 4–5 years before enjoyed better health MCS domain than those who had struggled with the disease for a few months – up to a year. Also, performing systematic screening and using medical advice and blood pressure self-control determined a better quality of life for patients. The analysis of the literature shows that the presence of negative emotional states worsens the quality of life, and depression is an independent risk factor for coronary heart disease [17]. Muller-Tasch et al. found that the main determinant of a worse quality of life in patients with heart failure was the presence of depressive disorders. Researchers found a statistically significant relationship between depression and all the indicators of quality of life according to the SF-36 [18]. Other authors report that the proportion of patients requiring pharmacological treatment for depression is higher among patients after myocardial infarction and with symptoms of heart failure (HF, heart failure) than among patients with stable angina [19].

In our study, it was found that in the Physical Activity Domain (PCS) people aged 51 to 60 showed a significantly lower quality of life than the elderly. This is due to the fact that younger people hold different social and professional responsibilities and the emerging disease often suddenly reduces their ability to fulfil these responsibilities. Van Jaarsveld et al. also showed that patients of both sexes under 55 years of age assessed their quality of life significantly lower than older people [20]. However, in studies conducted by Arendarczyk and Łoboz-Grudzień it was found that the quality of life of patients after myocardial infarction declines with patients' increasing age [21]. In the analysis

by German researchers in a group of patients with symptoms of chronic stable heart failure the lowest values related to the quality of life indicators included in total physical health (PCS), and in particular restrictions on the roles played because of physical health and general health perception [22, 23]. Similar results were obtained by authors in a British survey: the lowest level of the quality of life was observed in the indicators associated with total physical health, and the absolute values were almost twice lower than the standards for the British population [23, 24]. In summary, many authors indicate that the related quality of life state of health is an important indicator that should be considered on a par with medical health indicators. Monitoring the quality of life of patients with chronic diseases can be useful in the modification of treatment and in the risk stratification of death or additional hospitalization [24, 25, 26, 27].

CONCLUSIONS

1. Quality of life in patients after myocardial infarction is varied.
2. Factors that influence the physical domain of patients' quality of life the most are: gender, age, education and disability.
3. Preventive measures related to systematic execution of examinations, use of medical advice and self-monitoring of blood pressure determined the quality of patients' lives in the psychological domain.
4. Support from family/friends determines the quality of patients' lives in both the physical and the mental domains.
5. It is appropriate to monitor the quality patients' lives after myocardial infarction and take preventive action affecting the quality of life.

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