Folia Cardiologica 2014
tom 9, nr 3, strony 213–226

ISSN 2353–7752

# Gender differences in health-related quality of life after percutaneous coronary intervention in patients with acute coronary syndrome

## Jakość życia pacjentów z ostrym zespołem wieńcowym po przezskórnej interwencji wieńcowej — różnice płci

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## Abstract

**Introduction.** Only a few authors conducted comparative analyses of early and late health-related quality of life (HRQoL) depending on gender of patients with acute coronary syndrome (ACS) and discussed the factors affecting the late HRQoL in this group. We hypothesized that women with ACS are characterised by worse long-term (6th month follow-up HRQoL) after percutaneous coronary intervention (PCI).

To examine the dynamics of changes in HRQoL between the baseline and 6th month follow-up after ACS, depending on gender, and to determine sociodemographic and clinical predictors at baseline, which may have an impact on 6th month follow-up assessment of HRQoL.

**Material and methods.** The study included 140 consecutive patients (70 women and 70 men) with ACS who were subjected to PCI. The patients were divided depending on gender: **group I** (n = 70) — women with ACS without ST elevation (NSTEMI; n = 14) and those with ST elevation (STEMI; n = 56); **group II** (n = 70) — men with ACS without ST elevation (NSTEMI; n = 9) and those with ST elevation (STEMI; n = 61).

HRQoL was assessed two times (at baseline and 6th month follow-up) of Short Form 36 (SF-36) questionnaire, and the effect of sociodemographic and clinical factors on physical (PCS) and mental (MCS) component summary scores was evaluated.

**Results.** Compared to men, women presented with significantly lower PCS and MCS scores, both at baseline and at 6th month-follow-up. On univariate analysis, significantly lower PCS scores were observed among women, patients older than 70 years, physically inactive, not smoking, retired, and diagnosed with depressive symptoms. In contrast, we did not reveal any significant effects of the analysed variables on MCS on univariate analysis. The multivariate stepwise logistic regression analysis identified female gender and age > 70 as significant predictors of 6th month follow-up HRQoL in both PCS and MCS of SF-36. Moreover, marital status, and depression turned out to negatively affect the HRQoL in PCS. Adjusted odds ratio revealed that women were at three- and two-fold greater risk of decreased PCS and MCS, respectively.

**Conclusions.** Among the patients with ACS, women showed lower HRQoL than men, both at baseline and at 6th month follow-up. Both women and men showed improvement in PCS at 6th month follow-up but MCS improvement was observed only for women. The significant baseline predictors of 6th month follow-up HRQoL were female gender, age and marital status.

Key words: health-related quality of life, acute coronary syndrome, gender differences

(Folia Cardiologica 2014; 9, 3: 213–226)

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## Introduction

The studies from the last decade centred around long-term health-related quality of life (HRQoL) in many of the chronic diseases [1]. HRQoL, defined as the impact of disease on a patient's functioning as perceived and reported by the patient, has gained increasing recognition as an important endpoint. HRQoL is a multidimensional construct, encompassing aspects of psychological, social, and physical well-being, and should reflect a patient's, rather than the health care professionals, subjective assessment of well-being [1].

Among factors determining HRQoL in patients with coronary artery disease, angina symptoms, presence of cardiovascular risk factors, such as arterial hypertension, smoking, hyperlipidaemia, diabetes, obesity and depressive symptom, socioeconomic conditions, education, marital status, level of social support, and applied pharmacotherapy and invasive treatment are listed [2, 3].

Low levels of HRQoL among patients with coronary artery disease are a potential "risk factor" of cardiovascular events, which more than triple the probability of death due to cardiovascular causes [4]. While there are numerous studies of late HRQoL in stable coronary artery disease [5, 6], only few authors addressed this issue in individuals with acute coronary syndrome (ACS) [7–9].

Studies concerning invasive interventions in ACS are mainly oriented on the assessment of the effect of therapy on mortality and incidence of coronary events. However, only few of them evaluated the impact on HRQoL [7].

The studies on the impact of gender on HRQoL outcome are limited and inconclusive [8, 9].

There is some controversy as to whether percutaneous coronary intervention (PCI) in ACS is beneficial either for women, or men. The evidence supports the thesis on a lack of differences in HRQoL in regards to gender [8, 10]; nevertheless, there are studies indicating lower values of HRQoL in women [5, 9].

Only a few authors conducted comparative analyses of early and late HRQoL depending on gender of patients with ACS and discussed the factors affecting the late HRQoL in this group [11].

We hypothesized that women with ACS are characterised by worse long-term HRQoL.

The aim of the study was to examine the dynamics of changes in HRQoL between the baseline and 6$^{th}$ month follow-up, depending on gender, and to determine socio-demographic and clinical predictors at baseline, which may have an impact on 6$^{th}$ month follow-up HRQoL.

## Material and methods

The study included 140 consecutive patients (70 women and 70 men) admitted to the Coronary Intensive Care Unit due to ACS between September 2008 and March 2009. All the patients underwent PCI and met the inclusion criteria. The clinical diagnosis of ACS was based on the European Society of Cardiology (ESC) guidelines [12, 13]. All patients gave informed consent for participating in the study.

The patients were divided into groups depending on gender: 1) **Group I** (n = 70) — women aged 44–95 years ($\bar{\chi}$ = 67.6) with acute coronary syndrome without ST elevation (NSTEMI; n = 14), who underwent early invasive treatment, and those with ST elevation (STEMI; n = 56), who underwent primary coronary angioplasty; and 2) **Group II** (n = 70) — men aged 32–95 years ($\bar{\chi}$ = 59.2) with acute coronary syndrome without ST elevation (NSTEMI; n = 9), who underwent early invasive strategy, and those with ST elevation (STEMI; n = 61), who underwent primary coronary angioplasty.

STEMI was defined as the presence of: 1) typical chest pain lasting > 30 minutes, 2) ST-segment elevation ≥ 2 mm in contiguous chest leads and/or ST-segment elevation at ≥ 1 mm in ≥ 2 standard leads, or new left bundle branch block, and 3) positive cardiac necrosis markers [12].

NSTEMI was defined as the presence of: 1) typical chest pain, 2) absence of ST-segment elevation, and 3) positive cardiac necrosis markers [13].

Only the patients who underwent PCI were included in the analysis. All patients with acute coronary syndrome (STEMI, NSTEMI), demonstrating sufficient mental awareness and enough knowledge of Polish to complete the questionnaire were enrolled in the study.

Patients admitted with severe disturbances, such as cardiogenic shock, pulmonary oedema, and ventricular fibrillation, patients with very limited HRQoL due to non-cardiac diseases, such as chronic obstructive pulmonary disease (COPD), stroke, cancer, mental disorder, as well as patients addicted to alcohol and other psychoactive substances were excluded from the study.

In the present study, the assessment of HRQoL was carried out twice: in the 1$^{st}$ week (baseline) after PCI and at 6$^{th}$ month-follow-up after the procedure. Both inquiries were completed in the presence of an examining person. The examination was performed by a trained nurse. The second assessment was conducted at the hospital's Cardiology Outpatient Department by the same person. A total of 67 women and 70 men took part in the follow-up; three women died within 5–6 months after the initiation of the study (from non-cardiovascular causes).

The protocol of the study was approved by the Bioethics Committee of Wroclaw Medical University (decision no. KB-234/2009).

We used the analysis of medical documentation determining the patient's clinical state and case data based on medical history. Assessment of HRQoL was conducted with the Polish version of general HRQoL Short Form 36 (SF-36) questionnaire. We used the SF-36 questionnaire under

the license No. H1-051105-2244 issued by Quality Metric Incorporated, USA.

SF-36 questionnaire is one of the most commonly used tools for determining the HRQoL of both various groups of patients and the general population. The questionnaire consists of 36 items used for testing two domains: 1) physical (physical component summary, PCS), consisting of four subscales: physical functioning (PF), role limitations due to physical problems (RP), bodily pain (BP), and general health perception (GH), and 2) mental (MCS, mental component summary,), also comprising four subscales: vitality (VT), social functioning (SF), role limitation due to emotional problems (RE), and subjective assessment of mental health (MH). The results oscillate between 0 and 100 in each category, with the lower scores corresponding to poorer QoL. The SF-36 scale has shown satisfactory psychometric parameters, and has Polish validation [14]. The SF-36 health status survey is a standardized and validated instrument, recommended by the American Association of Cardiovascular and Pulmonary Rehabilitation, used for evaluating HRQoL in patients with cardiovascular disorders [14]. The SF-36 questionnaire has been widely used in various countries with different population groups, and with patients with both medical and psychiatric conditions. Transversal studies have shown that the SF-36 is a valid and reliable instrument for detecting differences between groups defined by age, sex, socio-economic status, and clinical condition [1].

Baseline depressive symptoms was evaluated using the Beck Depression Inventory which is a self-scoring test for symptoms and severity of depression composed of 21 questions and offering four answers scored 0 to 3 points. A score ≥ 10 indicates moderate symptoms of depression. The higher the score, the worse the mental condition of the patient. None of the patients had history of depression, and has not been administered antidepressants.

In order to investigate the correlation between depressive symptoms and the HRQoL, the patients were divided into two groups. All patients who scored more than 10 points on the Beck Depression Inventory were placed in the group with depressive symptoms. This approach was consistent with the guidelines of the authors of the Index, and has been used in many previous studies [15, 16].

Patients' sociodemographic data concerning gender, age, marital status, education, and occupational activity were collected. All respondents were given questionnaires containing comprehensive information about the conducted study, asked to express their consent, and assured of absolute anonymity.

We evaluated the effect of sociodemographic factors, such as gender, age, marital status, education, and occupational activity on HRQoL. Additionally, variables which may affect HRQoL were subjected to analysis of ACS type (STEMI or NSTEMI) and risk factors, and levels of depressive symptoms. The list of potential risk factors included tobacco smoking, obesity (BMI, body mass index ≥ 30 kg/m$^2$) or overweight (BMI = 25–29.9 kg/m$^2$), abdominal obesity identified according to guidelines (waist circumference ≥ 80 cm in women and ≥ 94 cm in men) [17], dyslipidaemia according to ESC criteria (triglycerides ≥ 150 mg/dl, cholesterol HDL [high-density lipoprotein] < 40 mg/dl or 1.0 mmol/l in men and < 45 mg/dl or 1.3 mmol/l in women, total cholesterol ≥ 190 mg/dl, cholesterol LDL [low-density lipoprotein] ≥ 115 mg/dl), diabetes (diagnosed on the basis of regular administration of hypoglycaemic drugs and/or results of laboratory tests), arterial hypertension (SBP, systolic blood pressure ≥ 140 mm Hg and/or DBP, diastolic blood pressure ≥ 90 mm Hg in measurements conducted twice, or regular administration of antihypertensive drugs [17]. Physical activity on admission was analysed as a binary variable (non-active vs. moderately active). The evaluation was based on our original questionnaire. The activity (walking, cycling) undertaken at least three times a week for less than 30 minutes, was considered as no activity, and the activity undertaken more than three times weekly, with each session lasting at least 30 minutes, was considered as moderate.

## Statistical analysis

Statistical analysis was conducted with STATISTICA 9.0 package (StatSoft, USA). The type of distribution was verified for all tested variables with the Shapiro-Wilk's test. P = 0.05 was considered as critical significance level. For measurable (quantitative) variables, arithmetic means, standard deviations, medians, and ranges were calculated, and statistical characteristics of qualitative variables were presented as their percentage distributions. We used contingency tables and chi-square test ($\chi^2$) or odds ratio for the analysis of qualitative variables. Comparisons of quantitative variables in two independent groups (e.g. F vs. M) were performed with the Mann-Whitney U-test, and dependent variables were compared with the Wilcoxon signed-rank test. In order to compare mean values of variables which did not meet the criteria of variance analysis, Kruskal-Wallis test was used. Taking into account their deviation from standard distributions, we used Spearman's rank correlation coefficient for assessing the power and direction of association between the tested variables (standards of HRQoL and some clinical factors). The Spearman's correlation coefficient was calculated for each pair of variables, and the level $p < 0.05$ was regarded as statistically significant.

The results of the SF-36 were presented as cardinality and percentages in tables four-pole cross (cross tabulation). The strength of the analysed correlation dichotomous variables estimated by the odds ratio and 95% confidence intervals for the odds ratio. The adjusted Mantel-Haenszel

odds ratio and its 95% confidence interval were calculated in order to exclude potential effect of confounding variables.

## Results

### Patient characteristics

Demographic and clinical characteristics of the studied group are shown in Table 1. Women with ACS were significantly older than men, by 8 years on average (67.6 ± 12.7 vs. 59.2 ± 10.7; p < 0.001). Compared to men, women suffered more often from arterial hypertension (71.4% vs. 37.1%; p = 0.001), diabetes (40% vs. 21.4%; p = 0.05), and hyperlipidaemia (64% vs. 50%; ns). While obesity (BMI > 30) occurred more often among women than among men (52.8% vs. 41.4%; p = 0.05), the mean values of BMI did not differ significantly between genders (30.5 ± 5.5 vs. 29.6 ± 3.4; p = ns). Analysis of abdominal obesity (WHR, waist to hip ratio > 0.85) indicated that it occurred more often among men (95.7% vs. 65.7% in women; p < 0.001). Also, the mean value of WHR was higher for men (0.99 ± 0.06 vs. 0.85 ± 0.01; p < 0.001). Women were less physically active than men. As many as 84.3% of women confessed to no activity (Table 1).

Over half of the women lived alone (57.1% vs. 21.5%; p < 0.001). As many as 64% of men and 37% of women admitted to active tobacco smoking. Women were less educated than men (35.7% women vs. 11.4% men, p < 0.01) and more likely to not work or be retired (82.9% vs. 61.4% in men, p < 0.01). The analysis of depressive symptoms indicated that 74.3% of women vs. 51.4% of men achieved Beck Depression Inventory (BDI) score > 10 points; p = 0.01 (Table 1).

All patients were on optimal pharmacological treatment for secondary prevention, in accordance with ESC guidelines [12, 13].

### Comparison of PCS and MCS of SF-36 HRQoL — related to gender

Basic statistical characteristics of the results of HRQoL assessment within the analysed groups are shown in Figures 1 and 2. Compared to men, women presented with significantly lower values of physical component summary (PCS), both at baseline (1st week; 28.7 ± 8.1 in women vs. 36.2 ± 11.4 in men; p < 0.001) and at 6th month-follow-up (40.1 ± 11.3 vs. 48.2 ± 8.5; p < 0.001; Fig. 1). Analysis of the dynamics within PCS showed a favourable increasing trend in both groups: from 28.7 ± 8.1 to 40.1 ± 11.3 in women (p < 0.001) and from 36.2 ± 11.4 to 48.2 ± 8.5 in men (p < 0.001; Fig. 1).

Compared to men, women showed lower values of mental component summary (MCS), both at baseline (1st week; 36.7 ± 11.1 in women vs. 44.8 ± 10.8 in men; p < 0.001) and at 6th month follow-up (40.5 ± 8.8 vs. 42.9 ± 6.6; p = 0.105; Fig. 2). Analysis of dynamics within MCS indicated a favourable increasing trend only in women (from 36.7 ± 11.1 to 40.5 ± 8.8; p < 0.005). In the group of men, the values of MCS showed a decreasing, albeit insignificant, trend (44.8 ± 10.8 vs. 42.9 ± 6.6; p = 0.087; Fig. 2).

### Comparison of subscales of PCS and MCS — related to gender

Compared to men, women exhibited significantly lower values in all domains of SF-36 questionnaire, both at baseline (1st week) and at the 6th month follow-up (Fig. 3).

The analysis of dynamics indicated a positive increasing trend in all domains of PCS (consisting of subscales: PF, RP, BP, and VT) and MCS (consisting of subscales: SF, RE, MH, and GH) in the group of women. In contrast, in the case of men the positive trend was observed in all subscales except MH.

Women with ACS reported lower HRQoL scores than men, both at baseline (1st week) and at 6th month follow-up. However long-term improvement of HRQoL was observed in both genders, in terms of PCS.

In addition, differences in the results of both groups were confirmed by subtracting the results of women from results of men, and subsequent use of the confidence interval (CI) 95%. The results are presented in Table 2.

After 6 months, the difference between the PCS values of men and women did not change significantly (p > 0.05). At the same time, the difference in the MCS decreased significantly (p < 0.001), suggesting superior effect of the therapy in women (Table 2).

### Analysis of 6th month follow-up PCS and MCS related to the presence of baseline variables

Lower HRQoL in the PCS domain was observed among women (40.1 ± 11.3 vs. 48.2 ± 8.5; p < 0.001), individuals older than 70 years (41.7 ± 11.0 vs. 47.3 ± 9.6; p < 0.01), with NSTEMI (38.2 ± 11.4 vs. 45.3 ± 10.3 vs. p < 0.01), physically inactive (43.2 ± 10.1 vs. 47.4 ± 10.9; p < 0.05), not smoking (37.6 ± 11.0 vs. 46.4 ± 9.7; p < 0.001), retired (41.5 ± ± 10.4 vs. 50.9 ± 8.5; p < 0.001), lone (40.3 ± 10.5 vs. 46.6 ± 10.2; p < 0.001) and diagnosed with depressive symptoms (BDI > 10 pts; 42.3 ± 10.5 vs. 46.7 ± 10.6; p = 0.01). In contrast, we did not reveal any significant effects of the analysed variables on MCS in univariate analysis (Table 3).

The patients were divided into subgroups depending on median values of PCS and MCS. Lower value of PCS was defined as < 46.45 and higher value was defined as ≥ 46.45, respectively, lower value of MCS was defined as < 43.44 and higher value was defined as ≥ 43.44. The effect of analysed variables on lower values of 6th month follow-up HRQoL in the area of PCS and MCS domains was showed in Table 4. The following baseline variables proved to be significant prognostic factors of lower 6th month

**Table 1.** Demographic and clinical characteristics of the examined group (n = 140)

| | Group I Females n = 70 | | Group II Males n = 70 | | Total n = 140 | | I vs. II p |
|---|---|---|---|---|---|---|---|
| | n | (%) | n | (%) | n | (%) | |
| **Age** | | | | | | | |
| mean ± SD | 67.6 ± 12.7 | | 59.2 ± 10.7 | | 63.4 ± 12.5 | | **< 0.001** |
| **ACS** | | | | | | | **ns** |
| STEMI | 56 | 80 | 60 | 87 | 117 | 83.6 | |
| NSTEMI | 14 | 20 | 10 | 13 | 23 | 16.4 | |
| **Marital status** | | | | | | | |
| Married | 30 | 42.9 | 55 | 78.6 | 85 | 60.7 | **< 0.001** |
| Lone | 40 | 57.1 | 15 | 21.5 | 55 | 39.3 | |
| **Physical activity** | | | | | | | |
| None | 59 | 84.3 | 49 | 70 | 108 | 77.1 | ns |
| Moderate | 11 | 15.7 | 21 | 30 | 32 | 22.9 | |
| **Occupational activity** | | | | | | | |
| Employed | 12 | 17.1 | 27 | 38.6 | 39 | 27.9 | **< 0.01** |
| Not employed/retired | 58 | 82.9 | 43 | 61.4 | 101 | 72.1 | |
| **Smoking tobacco** | | | | | | | |
| Non-smoker | 44 | 63 | 25 | 36 | 69 | 49 | **< 0.001** |
| Smokes now | 26 | 37 | 45 | 64 | 71 | 51 | |
| **Diabetes** | **28** | **40** | **15** | **21.4** | **43** | **30.7** | < 0.05 |
| Arterial hypertension | 50 | 71.4 | 26 | 37.1 | 76 | 54.3 | **< 0.001** |
| Hyperlipidaemia | 45 | 64 | 35 | 50 | 114 | 81.4 | ns |
| **BMI [kg/m$^2$]** | | | | | | | |
| mean ± SD | 30.5 ± 5.5 | | 29.6 ± 3.4 | | 30.0 ± 4.6 | | ns |
| **BMI [kg/m$^2$]** | | | | | | | |
| > 25 | 9 | 12.9 | 9 | 12.9 | 18 | 12.9 | |
| 25.1–30 | 24 | 34.3 | 32 | 45.7 | 56 | 40 | **< 0.05** |
| 30.1–35 | 37 | 52.8 | 29 | 41.4 | 66 | 47.1 | |
| **Abdominal obesity** | | | | | | | |
| WHR > 0.85 | 46 | 65.7 | 67 | 95.7 | 113 | | **< 0.001** |
| **WHR [cm/cm]** | | | | | | | |
| mean ± SD | 0.85 ± 0.01 | | 0.99 ± 0.06 | | 0.92 ± 0.1 | | **< 0.001** |
| **Education** | | | | | | | |
| Elementary | 25 | 35.7 | 8 | 11.4 | 33 | 23.6 | |
| Occupational | 15 | 21.4 | 40 | 57.1 | 55 | 39.3 | **< 0.01** |
| Postgraduate | 30 | 42.9 | 22 | 32.4 | 52 | 37.1 | |
| **Depression 1$^{st}$ week** | | | | | | | |
| BDI ≤ 10 pts | 18 | 25.7 | 34 | 48.6 | 52 | 37.1 | |
| BDI > 10 pts | 52 | 74.3 | 36 | 51.4 | 88 | 62.9 | **0.01** |

SD — standard deviation; ACS — acute coronary syndrome; STEMI — acute coronary syndrome with ST elevation; NSTEMI — acute coronary syndrome without ST elevation; BMI — body mass index; WHR — waist to hip ratio; BDI — Beck Depression Inventory

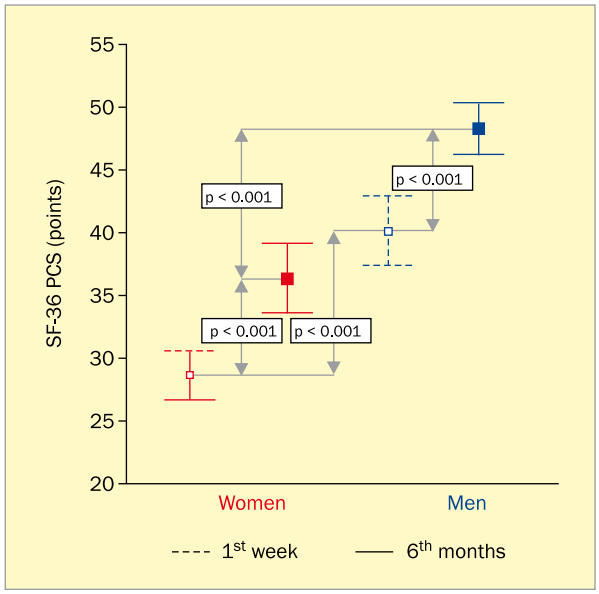


**Figure 1.** Mean and 95% confidence interval value within physical component summary (PCS) — the group of females and males in 1st week (baseline) and at 6th month follow-up; SF-36 — Short Form 36

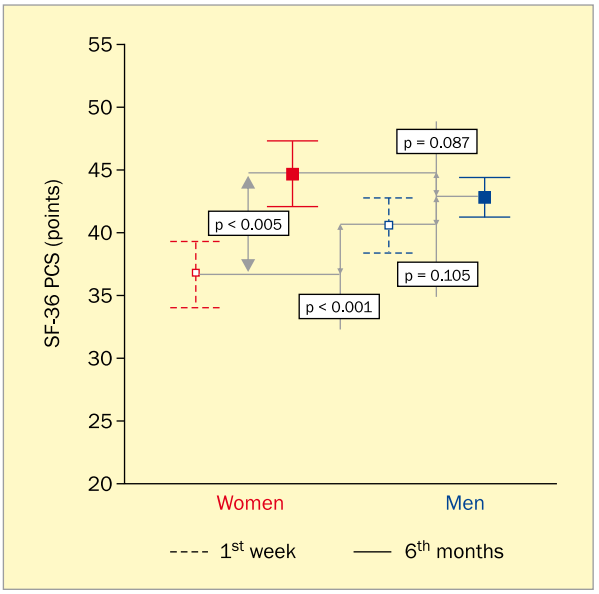


**Figure 2.** Mean and 95% CI value within mental component summary (MCS) — the group of females and males in 1st week (baseline) and at 6th month follow-up; SF-36 — Short Form 36

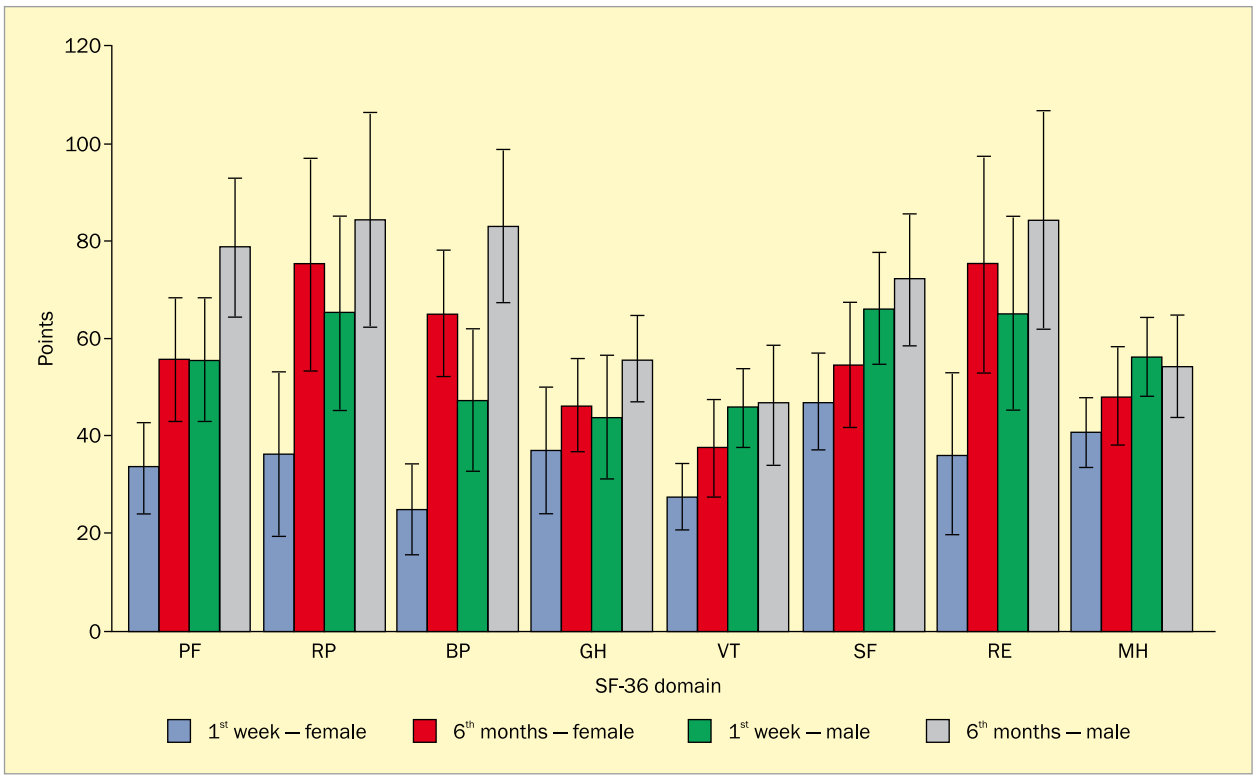


**Figure 3.** Mean values in subscales of Short Form 36 (SF-36) — the group of females and males in 1st week and at 6th months follow-up: PF — physical functioning; RP — role limitations due to physical problems; BP — bodily pain; GH — general health perception; VT — vitality; SF — social functioning; RE — role limitation due to emotional problems; MH — mental health

**Table 2.** Relative differences (with 95% confidence intervals) in physical component summary (PCS) and mental component summary (MCS) scores of men (M) and women (F)

| SF-36 (points) | M — F 1st week | M — F 6th months | 1st week vs. 6th months P level |
|---|---|---|---|
| SF-36 PCS | 7.5 (4.2 ÷ 10.8) | 8.1 (4.8 ÷ 11.4) | ns |
| SF-36 MCS | 8.1 (4.4 ÷ 11.8) | 2.4 (–0.2 ÷ 5.1) | < 0.001 |

ns — not statistically significant

follow-up PCS domains (< 46.45): gender (OR, odds ratio = 2.86; 95%CI = 1.44 ÷ 5.69), age (OR = 5.36; 95%CI = 2.42 ÷ 11.9), marital status (OR = 4.25; 95%CI = 2.05 ÷ ÷ 8.82), lack of physical activity (OR = 2.30; 95%CI = 1.01 ÷ 5.23), non-smoking (OR = 3.55; 95%CI = 1.55 ÷ 8.10), lack of occupational activity (OR = 3.58; 95%CI = 1.60 ÷ ÷ 7.97), and depression (OR = 2.73; 95%CI = 1.34 ÷ 5.56). No significant prognostic factors of lower MCS (< 43.44) among the studied variables was found (Table 4).

The coefficients of linear correlation (r) between quantitative baseline characteristics of patients and their determined 6th month follow-up HRQoL are presented in Table 5. A negative correlation between 6th month follow-up PCS score and age (r = –0.394), depressive symptoms (r = –0.318), and the occurrence of abdominal obesity (r = –0.259) was shown among women. No significant correlation between 6th month follow-up MCS and other analysed variables was revealed. Significant negative correlations were revealed in men: between abdominal obesity and 6th month follow-up MCS (r = –0.239) and between depressive symptoms and 6th month follow-up PCS (r = –0.323; Table 5).

### Baseline predictors of lower HRQoL at 6th month follow-up

Baseline variables that turned out to be significant in the univariate analysis were taken into account for the multivariate forward stepwise logistic regression analysis.

Adjusted odds ratios and their 95% confidence intervals are presented in Table 6. Comparing the value of crude odds ratio (Model 1), women are at three-fold greater risk of lower 6th month follow-up PCS than men ($OR_{MH}$ = 2.86). Although, the value of odds ratio decreased after adjusting for confounding variables, such as age, marital status, and depression (Model 4). Female gender was still associated with two-fold greater risk of lower 6th month follow-up PCS (Mantel-Haenszel odds ratio, $OR_{MH}$ = 2.11). Univariate analysis showed that the gender had no significant effect on the lower value of MCS, but in multivariate analysis, after adjusting for age, marital status and depression probability of lower 6th month follow-up MCS was two-fold-greater among women than in men ($OR_{MH}$ = 1.83) (Table 6).

## Discussion

### Dynamics of HRQoL — gender-specific differences

PCI have been shown to improve the short- and long-term outcomes in men and women with ACS. However, it still remains unclear whether the PCI exerts as favourable effect on HRQoL for women as for men [18].

Despite numerous studies analysing the effect of PCI on HRQoL in patients after ACS, the data on the gender-specific dynamics of HRQoL are limited and inconclusive [9, 19, 20]. Previous studies revealed that HRQoL after ACS is poorer in women than in men [5]; however, some authors did not observe such gender-related differences [8]. While some data on gender-related differences in ACS risk profile are available [21], little is known on the specificity of adaptation after the disease in men and women. Our study adds to the ongoing discussion on whether there are gender-related differences in HRQoL after ACS.

We revealed that HRQoL scores of women are lower than in men, both at baseline and at 6th month-follow-up. Nevertheless, the relative increase of HRQoL in all domains of SF-36 questionnaire was greater among women. Our results are consistent with the findings of other authors, who also revealed that HRQoL scores among women after ACS are lower than in men [9, 20]. Pettersen et al. [20] analysed a group of 408 patients 2.5 years after ACS and revealed that women had considerably poorer HRQoL scores than men in each domain of SF-36 questionnaire. Mortensen et al. [9] assessed HRQoL and depression in 1351 patients with NSTEMI, one and twelve months after ACS, with regards to the therapeutic approach (invasive treatment vs. fibrinolysis). They revealed that after invasive treatment HRQoL of women was lower than in men [9]. Also Westin et al. observed lower values of HRQoL in women both one month and one year after ACS [5].

We observed improvement of HRQoL in both women and men; however, dissimilar improvement patterns were recorded. Although improvement in PCS was observed for both genders, the scores of women were lower, plausibly, due to the exacerbation of somatic symptoms. Concerning MCS on follow-up, increased scores were observed solely for women, and a decrease was documented for men.

**Table 3.** Mean values of physical component summary (PCS) and mental component summary (MCS) scores at 6th month follow-up depending on the presence of analysed baseline variables

| Variables | SF-36 PCS | P level | SF-36 MCS | P level |
|---|---|---|---|---|
| **Sex** | | | | |
| Female (n = 70) | 40.1 ± 11.3 | **< 0.001** | 40.5 ± 8.8 | ns |
| Male (n = 70) | 48.2 ± 8.5 | **< 0.001** | 42.9 ± 6.6 | |
| **Age (years)** | | | | |
| < 70 (n = 61) | 47.3 ± 9.6 | **< 0.01** | 40.1 ± 7.7 | ns |
| ≥ 70 (n = 79) | 41.7 ± 11.0 | | 42.3 ± 8.0 | |
| **ACS** | | | | |
| STEMI (n = 117) | 45.3 ± 10.3 | **< 0.01** | 41.4 ± 8.0 | ns |
| NSTEMI (n = 23) | 38.2 ± 11.4 | | 43.4 ± 7.4 | |
| **Marital status** | | | | |
| Married (n = 85) | 46.6 ± 10.2 | **< 0.001** | 41.8 ± 7.4 | ns |
| Lone (n = 55) | 40.3 ± 10.5 | | 41.5 ± 8.6 | |
| **Exposure to stress** | | | | |
| Yes (n = 53) | 46.6 ± 10.1 | **< 0.05** | 41.3 ± 7.8 | ns |
| No (n = 87) | 42.7 ± 10.9 | | 41.9 ± 7.9 | |
| **Physical activity** | | | | |
| None (n = 108) | 43.2 ± 10.1 | **< 0.05** | 41.3 ± 8.0 | ns |
| Moderate (n = 32) | 47.4 ± 10.9 | | 43.0 ± 7.4 | |
| **Smoking tobacco** | | | | |
| Non-smoker (n = 36) | 37.6 ± 11.0 | **< 0.001** | 41.6 ± 8.6 | ns |
| Smokes now (n = 104) | 46.4 ± 9.7 | | 41.7 ± 7.7 | |
| **Occupational activity** | | | | |
| Employed (n = 39) | 50.9 ± 8.5 | **< 0.001** | 41.9 ± 6.5 | ns |
| Not employed/retired (n = 101) | 41.5 ± 10.4 | | 41.6 ± 8.4 | |
| **Diabetes** | | | | |
| Yes (n = 66) | 43.1 ± 10.6 | ns | 41.8 ± 7.5 | ns |
| No (n = 74) | 45.1 ± 10.8 | | 41.6 ± 8.3 | |
| **Arterial hypertension** | | | | |
| Yes (n = 102) | 43.4 ± 11.0 | ns | 41.6 ± 7.8 | ns |
| No (n = 38) | 46.1 ± 9.8 | | 41.9 ± 8.1 | |
| **Hyperlipidaemia** | | | | |
| Yes (n = 82) | 43.4 ± 11.5 | ns | 41.0 ± 8.1 | ns |
| No (n = 58) | 46.1 ± 9.4 | | 42.6 ± 7.6 | |
| **BMI [kg/m$^2$]** | | | | |
| ≤ 25 (n = 19) | 44.6 ± 8.9 | ns | 40.1 ± 9.9 | ns |
| 25.1 to 30 (n = 55) | 45.8 ± 10.7 | | 42.5 ± 8.1 | |
| ≥ 30.1 (n = 66) | 42.6 ± 11.2 | | 41.5 ± 7.0 | |
| **WHR [cm/cm]** | | | | |
| < 0,8 (F) or < 0.9 (M) (n = 23) | 41.3 ± 12.3 | ns | 39.9 ± 9.7 | ns |
| > 0.8 (F) or > 0.99 (M) (n = 117) | 44.7 ± 10.4 | | 42.1 ± 7.5 | |
| **Education** | | | | |
| Elementary (n = 88) | 43.1 ± 11.1 | ns | 42.1 ± 7.7 | ns |
| Occupational (n = 37) | 45.2 ± 10.1 | | 41.1 ± 8.2 | |
| Postgraduate (n = 15) | 47.8 ± 9.7 | | 40.7 ± 8.2 | |
| **Depression 1st week** | | | | |
| Yes (BDI > 10 pts) (n = 88) | 42.3 ± 10.5 | **0.01** | 40.9 ± 8.6 | ns |
| No (BDI ≤ 10 pts) (n = 52) | 46.7 ± 10.6 | | 43.1 ± 6.2 | |

SF-36 — Short Form 36; ns — not statistically significant; ACS — acute coronary syndrome; STEMI — acute coronary syndrome with ST elevation; NSTEMI — acute coronary syndrome without ST elevation; BMI — body mass index; WHR — waist to hip ratio; BDI — Beck Depression Inventory

**Table 4.** Baseline predictors of lower physical component summary (PCS) and mental component summary (MCS) — results of univariate analysis

| Variables | SF-36 PCS after 6th month follow-up | | | SF-36 MCS after 6th month follow-up | | |
|---|---|---|---|---|---|---|
| | < 46.45 n = 70 | ≥ 46.45 n = 70 | OR (95% CI) | < 43.55 n = 70 | ≥ 43.55 n = 70 | OR (95% CI) |
| **Gender** | | | | | | |
| Female (n = 70) | 44 (62.9%) | 26 (37.1%) | **OR = 2.86** | 39 (55.7%) | 31 (44.3%) | OR = 1.58 |
| Male (n = 70) | 26 (37.1%) | 44 (62.9%) | **(1.44 ÷ 5.69)** | 31 (44.3%) | 39 (55.7%) | (0.81 ÷ 3.08) |
| **Age (years)** | | | | | | |
| > 70 (n = 46) | 35 (50.0%) | 11 (15.7%) | **OR = 5.36** | 19 (27.1%) | 27 (38.6%) | OR = 0.59 |
| ≤ 70 (n = 94) | 35 (50.0%) | 59 (84.3%) | **(2.42 ÷ 11.9)** | 51 (72.9%) | 43 (61.4%) | (0.29 ÷ 1.21) |
| **ACS** | | | | | | |
| NSTEMI (n = 23) | 15 (21.4%) | 8 (11.4%) | OR = 2.11 | 10 (14.3%) | 13 (18.6%) | OR = 0.73 |
| STEMI (n = 117) | 55 (78.6%) | 62 (88.6%) | (0.83 ÷ 5.37) | 60 (85.7%) | 57 (81.4%) | (0.30 ÷ 1.80) |
| **Marital status** | | | | | | |
| Lone (n = 55) | 39 (55.7%) | 16 (22.9%) | **OR = 4.25** | 25 (35.7%) | 30 (42.9%) | OR = 0.74 |
| Married (n = 85) | 31 (44.3%) | 54 (77.1%) | **(2.05 ÷ 8.82)** | 45 (64.3%) | 40 (57.1%) | (0.38 ÷ 1.46) |
| **Physical activity** | | | | | | |
| None (n = 108) | 59 (84.3%) | 49 (70.0%) | **OR = 2.30** | 55 (78.6%) | 53 (75.7%) | OR = 1.18 |
| Moderate (n = 32) | 11 (15.7%) | 21 (30.0%) | **(1.01 ÷ 5.23)** | 15 (21.4%) | 17 (24.3%) | (0.53 ÷ 2.59) |
| **Smoking tobacco** | | | | | | |
| Non-smoker (n = 36) | 26 (37.1%) | 10 (14.3%) | **OR = 3.55** | 17 (24.3%) | 19 (27.1%) | OR = 0.86 |
| Smokes now (n = 104) | 44 (62.9%) | 60 (85.7%) | **(1.55 ÷ 8.10)** | 53 (75.7%) | 51 (72.9%) | (0.40 ÷ 1.84) |
| **Occupational activity** | | | | | | |
| Not employed/retired (n = 101) | 59 (84.3%) | 42 (60.0%) | **OR = 3.58** | 49 (70.0%) | 52 (74.3%) | OR = 0.81 |
| Employed (n = 39) | 11 (15.7%) | 28 (40.0%) | **(1.60 ÷ 7.97)** | 21 (30.0%) | 18 (25.7%) | (0.39 ÷ 1.69) |
| **Hypertension** | | | | | | |
| Yes (n = 102) | 53 (75.7%) | 49 (70.0%) | OR = 1.34 | 52 (74.3%) | 50 (71.4%) | OR = 1.16 |
| No (n = 38) | 17 (24.3%) | 21 (30.0%) | (0.63 ÷ 2.82) | 18 (25.7%) | 20 (28.6%) | (0.55 ÷ 2.44) |
| **Diabetes** | | | | | | |
| Yes (n = 66) | 36 (51.4%) | 30 (42.9%) | OR = 1.41 | 35 (50.0%) | 31 (44.3%) | OR = 1.26 |
| No (n = 74) | 34 (48.6%) | 40 (57.1%) | (0.73 ÷ 2.75) | 34 (50.0%) | 39 (55.7%) | (0.73 ÷ 2.75) |
| **Hyperlipidaemia** | | | | | | |
| Yes (n = 82) | 45 (64.3%) | 37 (52.9%) | OR = 1.61 | 46 (65.7%) | 36 (51.4%) | OR = 1.81 |
| No (n = 58) | 25 (35.7%) | 33 (47.1%) | (0.82 ÷ 3.16) | 24 (34.3%) | 34 (48.6%) | (0.92 ÷ 3.58) |
| **BMI** | | | | | | |
| > 30 (n = 66) | 36 (51.4%) | 30 (42.9%) | OR = 1.41 | 37 (52.9%) | 29 (41.4%) | OR = 1.59 |
| ≤ 30 (n = 74) | 34 (48.6%) | 40 (57.1%) | (0.73 ÷ 2.75) | 33 (47.1%) | 41 (58.6%) | (0.81 ÷ 3.09) |
| **WHR** | | | | | | |
| < 0,8 (n = 50) | 28 (40.0%) | 22 (31.4%) | OR = 1.45 | 26 (37.1%) | 24 (34.3%) | OR = 1.13 |
| > 0.8 (n = 90) | 42 (60.0%) | 48 (68.6%) | (0.73 ÷ 2.92) | 44 (62.9%) | 46 (65.7%) | (0.57 ÷ 2.26) |
| **Education** | | | | | | |
| Elementary (n = 88) | 48 (68.6%) | 40 (57.1%) | OR = 1.45 | 41 (58.6%) | 47 (67.1%) | OR = 0.69 |
| Occupational (n = 52) | 22 (31.4%) | 30 (42.9%) | (0.73 ÷ 2.92) | 29 (41.4%) | 23 (32.9%) | (0.35 ÷ 1.38) |
| **Depression 1st week** | | | | | | |
| Yes (n = 88) | 52 (74.3%) | 36 (51.4%) | **OR = 2.73** | 45 (64.3%) | 43 (61.4%) | OR = 1.13 |
| No (BDI ≤ 10 pts; n = 52) | 18 (25.7%) | 34 (48.6%) | **(1.34 ÷ 5.56)** | 25 (35.7%) | 27 (38.6%) | (0.57 ÷ 2.24) |

Odds ratios significant at $p < 0.05$ marked **with bold**; SF-36 — Short Form 36; OR — odds ratio; CI — confidency interval; ACS — acute coronary syndrome; STEMI — acute coronary syndrome with ST elevation; NSTEMI — acute coronary syndrome without ST elevation; BMI — body mass index; WHR — waist to hip ratio; BDI — Beck Depression Inventory

**Table 5.** Correlation coefficients r of predictors measured baseline with physical component summary (PCS) and mental component summary (MCS) after 6th month follow-up

| Variables | 6th month follow-up | | | |
|---|---|---|---|---|
| | SF-36 PCS | | SF-36 MCS | |
| | F | M | F | M |
| Age (year of life) | **–0.394** | –0.079 | 0.065 | 0.197 |
| BMI [kg/m$^2$] | –0.129 | –0.056 | 0.219 | –0.157 |
| WHR [cm/cm] | **–0.259** | –0.166 | 0.056 | **–0.239** |
| Pack years (20 cigarettes/day/years) | 0.074 | –0.075 | –0.057 | 0.059 |
| BDI (points) | **–0.318** | –0.402 | **–0.323** | –0.144 |

Values r significant at level $p < 0.05$ marked **with bold**; SF-36 — Short Form 36; F — female; M — male; BMI — body mass index; WHR — waist hip ratio

**Table 6.** Multivariate stepwise logistic regression analysis of baseline predictors' influence on 6th month follow-up physical component summary (PCS) and mental component summary (MCS). Adjusted odds ratios

| Variables | SF-36 PCS < 46.45 | | SF-36 MCS < 43.55 | |
|---|---|---|---|---|
| | OR | 95% CI | OR | 95% CI |
| **Model 1** | | | | |
| Female gender | **2.86** | 1.44–5.69 | 1.58 | 0.81–3.08 |
| **Model 2** | | | | |
| Female gender | 1.92 | 0.89–4.15 | 2.06 | 0.99–4.30 |
| Age > 70 | **4.29** | 1.76–10.5 | **0.45** | 0.21–0.99 |
| **Model 3** | | | | |
| Female gender | **1.94** | 1.11–3.39 | **1.99** | 1.17–3.39 |
| Age > 70 | **2.90** | 1.64–5.14 | **0.53** | 0.31–0.93 |
| Marital status — lone | **3.12** | 1.76–5.50 | 0.71 | 0.41–1.23 |
| **Model 4** | | | | |
| Female gender | **2.11** | 1.36–3.28 | **1.83** | 1.19–2.81 |
| Age >70 | **4.31** | 2.62–7.09 | **0.54** | 0.35–0.85 |
| Marital status — lone | **3.25** | 2.05–5.14 | 0.76 | 0.49–1.18 |
| Depression BDI > 10 points | **2.18** | 1.40–3.41 | 1.17 | 0.76–1.79 |

SF-36 — Short Form 36; OR — odds ratio; CI — confidence interval; BDI — Beck Depression Inventory

In women, beneficial changes in HRQoL were recorded within physical (PCS) and mental (MCS) component summary. For the men, an increase in HRQoL was observed within all PCS subscales, but only within three subscales (VT, SF, RE) of MCS; improvement of MH subscale of MCS was not recorded for male patients. To the best of our knowledge, our record is the first observation of the decrease of MH subscale and MCS domain results for men.

Although Brink et al. [19] reported similar results, with superior MCS in women, they did not record a decrease in MCS scores among men [19].

In our study, the decreased scores of MCS and lack of improvement within MH subscale in men can be explained by younger age of this group of patients and psychological consequences of this fact. Compared to older males, younger men assign lower values to HRQoL due to limitations in fulfilling professional and social activities, leading to frustration resulting from divergence between needs and opportunity to fulfil them, as well as due to less satisfactory sexual life [21].

## Predictors of the HRQoL at 6th month follow-up

Female gender turned out to be a determinant of 6th month follow-up HRQoL. Multivariate analysis identified female gender as a significant predictor of lower HRQoL (both PCS and MCS) in the follow-up study. In univariate analysis, female gender turned out to be determinant only of lower PCS.

The reason for gender-specific differences in HRQoL in coronary artery disease is not clear. The differences can be explained by older age and greater number of concomitant

diseases among women at the time of initial diagnosis of ACS and by a worse degree of their functioning as compared to men [22].

In our study women were 8 years older than men at the time of ACS diagnosis. Furthermore, they presented with a greater number of concomitant diseases (diabetes and hypertension).

Lower HRQoL of women can be explained by higher prevalence of depressive symptoms in this group, lower educational level, and limitations of physical and social activity, causing increased escalation of stress and frustration [6]. In the present study, women were more likely to have primary education and did not engage in physical activity.

Dias et al. [3] investigated a group of 278 patients treated for ACS and identified female gender and symptoms of depression as predictors of worse mental health scores. In contrast, male gender, higher levels of education, and lack of cardiovascular incidents turned out to be predictors of higher physical health scores [3].

In our study, age over 70 constituted a determinant negatively affecting 6$^{th}$ month follow-up HRQoL.

Our results are consistent with the findings of Beck et al, who noted that younger age and higher baseline level of HRQoL constitute predictors of better HRQoL, especially PCS, 6 and 12 months after ACS [23].

However, Brown et al. reported contradictory findings as they observed that patients under 55 years of age evaluated their quality of life as poorer than older people. This can be explained by limitations in fulfilling professional and social activities [21].

Noticeably, our patients with NSTEMI had lower PCS scores at 6$^{th}$ month follow-up. However our work did not prove the impact of NSTEMI as a predictor of decreased HRQoL at 6$^{th}$ month follow-up. Poloński et al. [24] made comparisons between ST elevation and non-ST elevation myocardial infarction using a large registry database. They observed that non-ST myocardial infarction was associated with worse long-term prognosis [24].

Numerous studies in literature indicate that the worse long-term results in patients with NSTEMI may be associated with worse overall health of these group of patients.

The reasons for poorer HRQoL at 6$^{th}$ month follow-up remain unclear. This phenomenon may be explained by unfavourable clinical characteristics of patients with NSTEMI. According to Park et al. [25], NSTEMI can be associated with greater number of co-morbidities.

The effect of diabetes on HRQoL in patients with ACS remains controversial. In our univariate analysis, patients with diabetes and hypertension had lower PCS, but the difference turned out to be statistically insignificant.

The hereby presented results are consistent with the findings of our previous study, which showed that patients with ACS and diabetes report lower HRQoL than those without this condition. However, although individuals with diabetes showed lower HRQoL, this condition did not prove to be an independent determinant of lower HRQoL [26].

In contrast, Dias et al. reported that diabetes, arterial hypertension, and loneliness constitute predictors of decreased PCS scores in patients with ACS [3] and Schweikert et al. revealed that diabetes, older age, tobacco smoking, and increased BMI represent the main predictors of decreased QoL [27].

It is known that elevated depressive symptom have been associated with higher risk of adverse outcomes in both men and women with ACS [15, 16]. Higher BDI scores (≥ 10 points) turned out to be associated with decreased PCS in both univariate and multivariate analysis. Rumsfeld et al. [4] observed that 7 months following ACS, patients with depression show more frequent and severe symptoms of angina, more serious limitations on physical activity, and significantly lower HRQoL scores than individuals without depression.

de Jonge et al. [28] found a significant correlation between depression after myocardial infarction and poorer HRQoL, lower level of health-related satisfaction, higher rate of stenocardia, and higher degree of disability. Moreover, they observed a strong correlation between pre-infarction depression rate and lower HRQoL scores three months after the myocardial infarction. According to these authors, depression not only results from poorer health, but also can negatively affect one's health status [28].

Marital status (being lone) was also shown to exert a negative effect on HRQoL. In our study, the lone patients showed lower PCS than individuals who remained in relationships. Loneliness turned out to be a predictor of decreased PCS on both univariate and multivariate analysis. Also Dias et al. reported that lower PCS scores are characteristic for lonely people [3].

Overweight and abdominal obesity constituted predictors of lower HRQoL. We found that women had higher BMI. Although a negative correlation of WHR with PCS and MCS was observed, neither BMI nor WHR proved to be predictors of lower HRQoL in multivariate analysis.

Our univariate analysis revealed that non-smoking was a predictor of decreased PCS score. Active smokers have higher PCS scores than non-smokers. However in the multifactorial analysis, smoking status was not a predictor of affecting the assessment of HRQoL. These findings are consistent with the so-called smoker's paradox. According to CADILLAC registry, mortality rates of smokers are lower compared to non-smokers; however, this difference was no longer present after adjustment to younger age and fewer co-morbidities of smokers. Among smokers, female gender was a significant risk factor for adverse cardiovascular events at 6$^{th}$ month follow-up after ACS [29].

The lack of separate gender characteristics for smokers and non-smokers is a potential limitation of our study. Moreover, we did not analyse the number of cigarettes smoked or duration of smoking. The smoking status on admission was assessed only as a binary variable (current vs. never or former smoker).

Our findings warrant additional evaluation and further study of potential gender-related differences in the risks of smoking in a larger cohort of patients with ACS.

In summary, we revealed that the female gender and age over 70 are significant predictors of lower PCS and also MCS scores. After adjusting for confounding variables (Mantel-Haenszel odds ratio), the impact of female gender was decreased, albeit still statistically significant. Women with ACS had worse risk profile, show less favourable clinical characteristics and greater number of comorbidities. Therefore, it is surprising that diabetes and hypertension did not exert significant effect on PCS. Whereas, sociodemographic and psychological predictors, such as lack of marital status and symptoms of depression, had negative impact on HRQoL.

### Implications

Our findings may affect the need to implement psychological care, leading to early diagnosis of factors intensifying symptoms of depression, social support, and furthermore the need for screening and therapeutic actions oriented mainly on females.

Understanding gender-specific differences in HRQoL may have clinical significance and may affect developing individual approaches to therapy, secondary prevention, and rehabilitation after myocardial infarction [3].

The strong influence of sociodemographic predictors (lone, retirement) and symptoms of depression suggest that it would be beneficial to encourage patients to participate in cardiac rehabilitation programs, and to early resume the occupational and daily-life activity.

### Limitations

Potential limitations of our study include lack of control group, lack of reference levels of HRQoL for population of healthy individuals, and too short duration of the follow-up period. Also, the pre-infarction level of HRQoL of study participants remains unknown.

## Conclusions

Among the patients with ACS treated by PCI, women showed lower HRQoL than men, both at baseline and at 6$^{th}$ month follow-up. Although women and men showed improvement in PCS scores at follow-up examination, MCS improvement was observed only for women. The significant baseline predictors of 6$^{th}$ month follow-up HRQoL were female gender, age, and marital status.

## Conflict of interest

None declared.


### Streszczenie

**Wstęp.** Niewiele jest publikacji, w których dokonuje się analizy porównawczej wczesnej i odległej jakości życia (QoL) zależnie od płci w ostrym zespole wieńcowym (ACS) oraz analizuje wyznaczniki odległej QoL. Autorzy postawili hipotezę, że kobiety po ACS leczone z zastosowaniem przezskórnej interwencji wieńcowej (PCI) charakteryzują gorsze wyniki odległej QoL.

Celem pracy było zbadanie dynamiki zmian jakości życia po 6 miesiącach od PCI zależnie od płci oraz identyfikacja predyktorów (*baseline*) socjodemograficznych i klinicznych, które mogą wpływać na odległą QoL chorych hospitalizowanych z powodu ACS, poddawanych zabiegom angioplastyki wieńcowej.

**Materiał i metody.** Badania przeprowadzono u 140 pacjentów (70 kobiet, 70 mężczyzn) hospitalizowanych z powodu ACS poddawanych zabiegom PCI. Chorych podzielono na dwie grupy: **grupę I** (n = 70) — kobiety z ACS bez uniesienia ST (NSTEMI; n = 14) i z uniesieniem ST (STEMI; n = 56), **grupę II** (n = 70) — mężczyzn w wieku 32–95 lat (śr. wieku 59,2) z ACS bez uniesienia ST (NSTEMI; n = 9) i z uniesieniem ST (STEMI; n = 61). Jakość życia oceniano dwukrotnie (w pierwszym tygodniu po ACS i 6 miesięcy później) za pomocą kwestionariusza SF-36.

**Wyniki.** W porównaniu z mężczyznami u kobiet ocena jakości życia w wymiarze fizycznym (PCS) i psychicznym (MCS) była znacząco niższa zarówno w ocenie wyjściowej, jak i *follow-up.* W analizie jednoczynnikowej niższe wyniki odległej QoL w domenie PCS dotyczyły kobiet, osób powyżej 70. roku życia, nieaktywnych fizycznie, niepalących, na emeryturze i z rozpoznanymi objawami depresji. Z kolei w domenie MCS w analizie jednoczynnikowej nie zanotowano istotnego wpływu analizowanych zmiennych na QoL. W analizie wieloczynnikowej za istotne statystycznie predyktory QoL w domenach PCS i MCS w badaniu *follow-up* uznano płeć żeńską i wiek ponad 70 lat. Dodatkowo stan cywilny i depresja były predyktorami negatywnie wpływającymi na QoL w domenie PCS.

**Wnioski.** Wśród chorych z ACS kobiety cechowała niższa QoL niż badanych mężczyzn, zarówno w badaniu wyjściowym, jak i obserwacji *follow-up*. Obie badane grupy wykazały poprawę QoL w domenie PCS w badaniu *follow-up*, ale w domenie MCS poprawa ta dotyczyła jedynie badanych kobiet. Istotnym statystycznie predyktorem wpływającym na QoL 6 miesięcy po PCI były płeć żeńska, wiek i stan cywilny.

Słowa kluczowe: jakoś życia związana ze stanem zdrowia, ostry zespół wieńcowy, różnice płci

(Folia Cardiologica 2014; 9, 3: 213–226)

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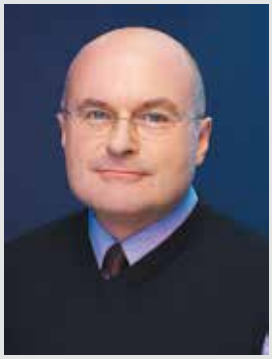
## Komentarz



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W pracy autorstwa Beaty Jankowskiej-Polańskiej i wsp. podjęto ważki temat zróżnicowanego klinicznego przebiegu choroby wieńcowej u mężczyzn i kobiet.

Należy przypomnieć, że w Polsce nadal więcej kobiet niż mężczyzn umiera z powodu chorób układu sercowo-naczyniowego [1].

Ostry zespół wieńcowy (ACS, *acute coronary syndrome*) u kobiet, zwłaszcza w ostatnich latach, jest problemem szczególnie docenianym przez kardiologów. Zaobserwowano bowiem, że z uwagi na płeć istnieją znaczące różnice zarówno pod względem stwierdzanych objawów, znaczenia markerów diagnostycznych, działań niepożądanym stosowanej terapii farmakologicznej, jak i występowania powikłań. W odniesieniu do czynników ryzyka sercowego kobiety, szczególnie starsze, cechuje wyższe ryzyko na przykład cukrzycy [2]. Według badań GUSTO IIb oraz TIMI IIIB 2 u kobiet częściej rozpoznaje się niestabilną dławicę piersiową i zawał serca bez uniesienia odcinka ST (NSTEMI, *non-ST-elevation myocardial infarction*). Natomiast u mężczyzn częściej występuje zawał pełnościenny (STEM, *ST-elevation myocardial infarction*) [3, 4]. Wiadomo również, że śmiertelność chorych z NSTEMI jest podobna zarówno w grupie mężczyzn, jak i kobiet. Z kolei jednak w grupie chorych z STEMI jest zdecydowanie większa wśród kobiet.

W praktyce klinicznej kobiety częściej zgłaszają dolegliwości, które początkowo bywają bagatelizowane. Ból, jeśli występuje, to ma charakter nietypowy, jest umiejscowiony w okolicy potylicznej lub jamy brzusznej. Często zgłaszane objawy to duszność, zawroty głowy, osłabienie czy zaburzenia koncentracji. Taki opis klinicznej manifestacji objawów trudno uznać za charakterystyczny dla choroby niedokrwiennej mięśnia sercowego. Warto zwrócić uwagę na subiektywne dolegliwości podawane przez chore, takie jak uczucie zmęczenia czy zaburzenia snu. Okazuje się, że w wielu przypadkach są to wczesne objawy ACS, poprzedzające jego wystąpienie u kobiet nawet o kilka tygodni [5].

Autorzy za cel pracy postawili sobie zbadanie dynamiki zmian jakości życia po 6 miesiącach od ACS zaopatrzonego za pomocą przezskórnej interwencji wieńcowej (PCI, *percutaneous coronary intervention*) zależnie od płci oraz identyfikację predykatorów socjologicznych, demograficznych i klinicznych, które mogą wpływać na odległą jakość życia (QoL, *quality of life*). W kontekście przytoczonych wyżej rozważań podjęcie badań wydaje się w pełni uzasadnione. I to mimo, że w doniesieniach z ubiegłej dekady pojawiały się dane ukazujące niższą QoL między innymi u kobiet z nadciśnieniem tętniczym w porównaniu z mężczyznami, które wykazywały tendencję wzrostową z wiekiem badanych. Wartość podjętego przez Autorów trudu uzasadnia zatem fakt zmieniających się cech populacyjnych i warunków demograficznych. Rosnąca systematycznie długość życia populacji europejskiej oraz zagrożenie depresją, zwłaszcza wśród kobiet w Polsce, to ważne czynniki upoważniające do systematycznego aktualizowania posiadanej wiedzy. W pewnym stopniu wyniki badań Autorów korespondują z wcześniej publikowanymi i potwierdzają niższą QoL kobiet w porównaniu z męż-

czyznami po przebytym ACS. Dotyczy to zarówno sfery fizycznej, jak i psychicznej. Warto podkreślić, że wiek badanych przekraczający 70 lat oraz płeć żeńska stanowiły istotne predykatory obniżonej QoL. Potwierdzona depresja, z kolei, istotnie obniżała samoocenę, zwłaszcza w sferze fizycznej, wpływając na postrzeganie siebie przez kobiety jako osoby bardziej chore niż w rzeczywistości.

Wartością dodaną przedstawionej pracy są wyniki obserwacji *follow-up*. Pocieszający jest bowiem fakt poprawy QoL zarówno w grupie mężczyzn, jak i kobiet po upływie 6 miesięcy od incydentu wieńcowego. Jednak, biorąc pod uwagę wpływ badanych zmiennych QoL, kobiety są grupą wymagająca szczególnej uwagi zarówno pod względem kardiologicznym, jak i długoterminowej opieki psychologicznej.

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