

Changes in health-related quality of life among patients with coronary artery disease: a 2-year follow-up

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Key words: health-related quality of life; coronary artery disease; longitudinal study; effect size.

Summary. The aim of this study was to evaluate the changes in health-related quality of life in patients with coronary heart disease according to age, gender, and treatment method.

Material and methods. The study enrolled 167 patients after acute myocardial infarction (MI), percutaneous transluminal coronary angioplasty (PTCA), and coronary artery bypass grafting (CABG). The mean age was 59.3 years; there were 71.9% of males. General health-related quality of life was measured using the SF-36 questionnaire. Patients were examined at the beginning of rehabilitation and after 6-, 12-, 18-, and 24-month follow-up. Effect sizes were computed to assess the changes in health-related quality of life over time.

Results. Health-related quality of life significantly improved at 6 months, but improvements did not continue over time. The largest effect size was seen in the pain domain. Effect sizes were greater in the physical health domains among male patients and among female patients in the mental health domain. With regard to age, effect sizes were greater in the physical functioning domain among older patients. With regard to treatment method, at baseline, the CABG patients had the poorest health-related quality of life; however, the largest effect sizes were seen in this group.

Conclusions. Health-related quality of life improved over 2 years; the greatest improvement was seen at 6 months. Males better improved on the physical component summary domain; there was no significant improvement in the mental component summary domain in males and females. Older patients improved better on the physical activity and physical component summary domains. Changes in health-related quality of life were related to treatment method.

Introduction

Health-related quality of life is an increasingly important outcome measure in the management and care of patients with chronic diseases, such as coronary artery disease (CAD), when the main treatment aim is not only to reduce mortality rates, but also to improve symptoms and ability to perform daily activities. Health-related quality of life in nature is multifaceted, based on the subjective perception of patient's health, and includes not only physical but also psychological and social functioning.

The majority of scientific literature indicates that health-related quality of life in CAD patients significantly improves over the first 6 months after acute coronary events (1, 2); however, the magnitude of changes in quality of life is rarely assessed. It has been suggested that improvement in health-related quality of life may vary depending on patients' age, gender, or treatment method.

The aim of this study was to evaluate the changes in health-related quality of life in patients with cor-

onary artery disease with regard to age, gender, and treatment method.

Material and methods

The study population comprised 167 patients after acute myocardial infarction (MI), percutaneous transluminal coronary angioplasty (PTCA), and coronary artery bypass grafting (CABG). The study was performed at the Clinic of Cardiovascular Rehabilitation, Institute of Psychophysiology and Rehabilitation, Palanga, Lithuania. One hundred eleven patients experienced acute MI, 24 underwent PTCA, and 32 underwent CABG. The mean age was 59.3 years (range, 35–84; SD, 9.9); there were 71.9% of males (120 males and 47 females). Patients were examined at the beginning of rehabilitation (baseline), after 6-, 12-, 18-, and 24-month follow-up.

During all study periods, 167 patients were examined.

The Regional Medical Research Ethics Committee approved the study. The Medical Outcomes

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Study 36-Item Short-form Health Survey (SF-36) was used to evaluate general health-related quality of life (3). It consists of eight multi-item subscales that assess health-related quality of life on eight domains: physical functioning (PF), social functioning (SF), role limitations due to physical problems (RPP), role limitations due to emotional problems (REP), mental health (MH), energy/vitality (EV), pain (P), and general health perception (GHP). In addition, the eight scales yield two summary scales of health, related to physical (physical component summary, PCS) and mental (mental component summary, MCS) functioning and well-being. Each of the SF-36 domains is scored on a scale of 0–100, with higher scores indicating better health-related quality of life. The Cronbach α (internal consistency) ranged from 0.71 to 0.85, except for social functioning scale (0.56). The NYHA functional classes were used to evaluate patients' functional status.

Statistical analysis of the data was performed using the packages SPSS for Windows 12 and Excel. Two mean values were compared using Student *t* test. Comparisons among more than two means were performed by repeated measures one-way and two-way analysis of variance. For post hoc analysis, the Bonferroni test was applied. The chi-square (χ^2) test was used to check homogeneity and independence of qualitative variables. The differences were considered statistically significant when $P < 0.05$. The changes in health-related quality of life were assessed by effect size (4), which is defined as the difference between two means divided by a standard deviation for the data. An effect size of 0.2 is considered a “small” effect; 0.5, a “moderate” effect; and 0.8 to infinity, a “large” effect (5). Effect sizes are widely used in assessing the changes in health-related quality of life (6–8). Changes in health-re-

lated quality of life were evaluated in the general study population and groups stratified by gender, age (2 groups, younger and older than 65 years), and treatment method (medication management, PTCA, or CABG). The age limit of 65 years was set because a substantial number of persons are retired at this age. The significance of differences in effect size was evaluated by unpaired *t* test (9); only statistically significant effect sizes were compared.

Results

In general, analysis of health-related quality of life in CAD patients during the 2-year period revealed that all domains in the SF-36, except general health perception ($P=0.245$) and mental component summary ($P=0.381$), improved significantly (Fig. 1).

The greatest improvement during the 6-month period was documented in the pain domain, i.e., lower pain intensity and fewer pain-related limitations in daily activities (effect size, 0.93; effect sizes in other domains, 0.63 to 0.22) (Table 1). Effect sizes in the general health perception (0.13) and mental component summary (0.12) domains were not statistically significant. Greater improvement in health-related quality of life was found in the physical component summary than mental component summary (larger effect size). During other periods of the study (after 1, 1.5, and 2 years), no significant changes in effect sizes were seen.

Analysis of the changes in health-related quality of life within 6 months by gender revealed significant effect sizes for all SF-36 domains, except general health perception and mental component summary domains, among male patients (Table 2). Among female patients, significant effect sizes were found for physical functioning, role limitations due to emotional problems, pain, mental health, energy/vitality, and physical component summary

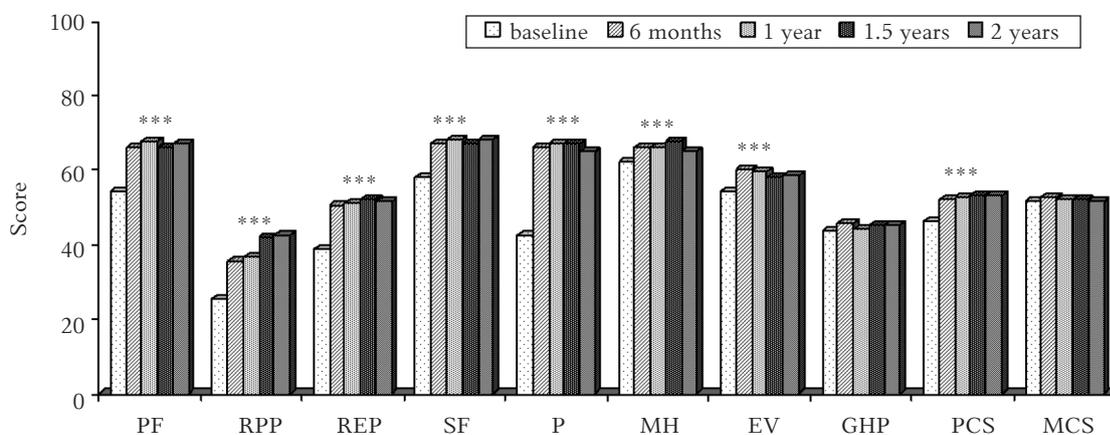


Fig. 1. Health-related quality of life in patients with coronary artery disease during the 2-year period
*** $P < 0.001$, all periods compared to baseline.

Table 1. Effect sizes of health-related quality of life in patients with coronary artery disease during 2-year period

SF-36 domain	Effect sizes			
	6 months (95% CI) n=167	1 year (95% CI) n=167	1.5 years (95% CI) n=167	2 years (95% CI) n=167
Physical functioning	0.49 (0.35; 0.62)*	0.54 (0.39; 0.69)*	0.48 (0.32; 0.65)*	0.51 (0.35; 0.68)*
Role limitation due to physical problems	0.28 (0.15; 0.42)*	0.30 (0.16; 0.45)*	0.47 (0.30; 0.63)*	0.47 (0.31; 0.64)*
Role limitation due to emotional problems	0.27 (0.14; 0.41)*	0.29 (0.14; 0.44)*	0.32 (0.15; 0.48)*	0.29 (0.13; 0.46)*
Social functioning	0.34 (0.21; 0.48)*	0.38 (0.24; 0.53)*	0.34 (0.08; 0.18)*	0.39 (0.22; 0.55)*
Pain	0.93 (0.79; 1.07)*	0.96 (0.80; 1.11)*	0.96 (0.79; 1.12)*	0.87 (0.70; 1.04)*
Mental health	0.22 (0.09; 0.35)*	0.22 (0.07; 0.36)*	0.29 (0.12; 0.45)*	0.16 (-0.01; 0.32)
Energy/vitality	0.27 (0.14; 0.40)*	0.25 (0.11; 0.40)*	0.17 (0.01; 0.34)*	0.21 (0.04; 0.37)*
General health perception	0.13 (0.00; 0.26)	0.05 (-0.10; 0.20)	0.12 (-0.04; 0.29)	0.10 (-0.07; 0.26)
Physical component summary	0.63 (0.49; 0.76)*	0.68 (0.53; 0.83)*	0.73 (0.56; 0.90)*	0.74 (0.57; 0.90)*
Mental component summary	0.12 (-0.01; 0.26)	0.09 (-0.06; 0.24)	0.07 (-0.09; 0.24)	0.03 (-0.13; 0.20)

CI, confidence interval.

* $P < 0.05$, significant effect sizes.

Table 2. Comparison of effect sizes of health-related quality of life in patients with coronary artery disease by gender at 6 months

SF-36 domain	Effect sizes (95% CI)		P comparing men and women
	Males n=120	Females n=47	
Physical functioning	0.53 (0.37; 0.69)*	0.42 (0.17; 0.68)*	<0.001
Role limitation due to physical problems	0.31 (0.15; 0.47)*	0.17 (-0.08; 0.42)	-
Role limitation due to emotional problems	0.28 (0.12; 0.43)*	0.31 (0.05; 0.56)*	0.02
Social functioning	0.38 (0.22; 0.54)*	0.24 (-0.01; 0.50)	-
Pain	0.94 (0.77; 1.10)*	0.93 (0.67; 1.19)*	0.438
Mental health	0.18 (0.02; 0.34)*	0.32 (0.06; 0.57)*	<0.001
Energy/vitality	0.27 (0.11; 0.43)*	0.30 (0.05; 0.56)*	0.02
General health perception	0.13 (-0.03; 0.29)	0.14 (-0.12; 0.39)	-
Physical component summary	0.67 (0.51; 0.83)*	0.57 (0.31; 0.82)*	<0.001
Mental component summary	0.10 (-0.06; 0.26)	0.18 (-0.07; 0.44)	-

CI, confidence interval.

* $P < 0.05$, significant effect sizes.

domains. The greatest improvement for male and female patients was seen in the pain domain; however, effect sizes were not significant comparing the groups. Male patients showed a significantly better improvement in the physical functioning and physical component summary domains. Female patients demonstrated significantly better improvements in the role limitation due to emotional problems, mental health, and energy/vitality domains. At baseline and 6 months, the functional status of male patients, according to the NYHA functional class, was better than that of female patients. Evaluating the changes according to the NYHA functional classes during the 6-month period, a significant improvement was seen in both the groups (Table 3).

Analyzing the effect sizes of changes in health-related quality of life during 6 months with regard to age, a significantly better improvement was found in the physical functioning and physical component summary domains among patients older than 65 years (Table 4). Effect sizes did not differ significantly in the role limitations due to emotional problems,

social functioning, and energy/vitality domains, but in patients younger than 65 years, a better improvement was found in the pain domain. The functional status was better in patients younger than 65 years at baseline and 6 months. The functional status significantly improved during the 6-month period in patients younger than 65 years; however, patients older than 65 years did not show any significant changes in the functional status (Table 3).

At baseline, health-related quality of life differed comparing the patients after MI, PTCA, or CABG with the lowest (poorest health-related quality of life) scores being in the group of patients with subsequent CABG. The scores were significantly lower on the physical functioning, role limitations due to physical problems, pain, social functioning, and physical component summary domains (Fig. 2). The functional status was poorest in the CABG group at baseline as well. Evaluating the changes with regard to NYHA functional class, a significant improvement in the functional status at 6 months was observed in the groups of CABG and MI pa-

Table 3. Comparison of clinical status in subject groups

Subject groups	NYHA functional class	%		
		Baseline	After 6 months	
Males (n=120)	I	3.4	8.2	$\chi^2=22.7, df=2, P<0.001$
	II	63.9	76.1	
	III	32.7	15.7	
Females (n=47)	I	1.1	0	$\chi^2=8.1, df=2, P=0.017$
	II	44.9	63.4	
	III	54.0	36.6	
Younger than 65 years (n=111)	I	3.9	8.1	$\chi^2=28.2, df=2, P<0.001$
	II	65.7	81.3	
	III	30.4	10.6	
Older than 65 years (n=56)	I	0.3	0	$\chi^2=1.4, df=2, P=0.492$
	II	44.1	51.4	
	III	55.6	48.6	
CABG (n=32)	I	1.4	1.6	$\chi^2=29.4, df=2, P<0.001$
	II	41.8	82.3	
	III	56.8	16.1	
PTCA (n=24)	I	9.4	10.7	$\chi^2=2.8, df=2, P=0.247$
	II	69.8	82.1	
	III	20.8	7.1	
MI (n=111)	I	1.8	6.5	$\chi^2=14.7, df=2, P=0.001$
	II	56.8	65.5	
	III	41.4	28.1	

CABG, coronary artery bypass grafting; PTCA, percutaneous transluminal coronary angioplasty; MI, myocardial infarction.

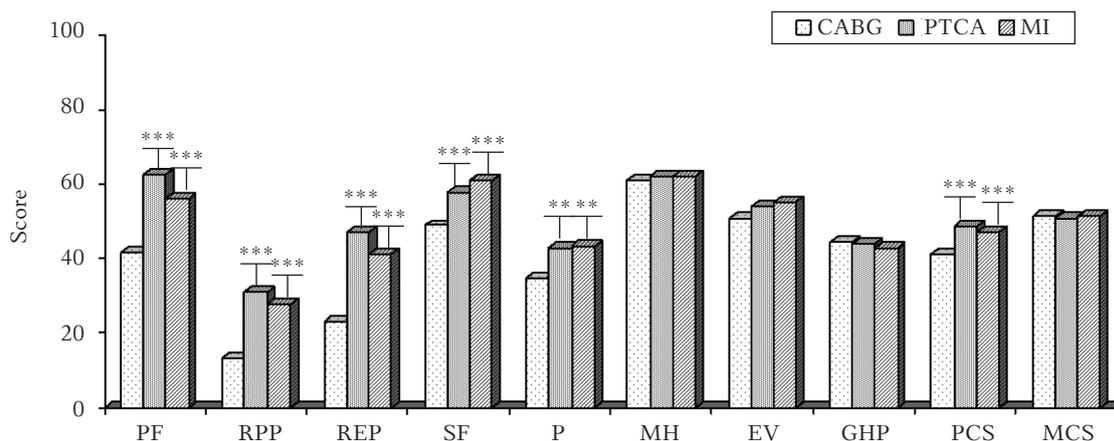


Fig. 2. Health-related quality of life in patients who underwent coronary artery bypass grafting (CABG) and percutaneous transluminal coronary angioplasty (PTCA) and experienced myocardial infarction (MI) at baseline
 ** $P<0.01$, *** $P<0.001$, compared to CABG group.

Table 4. Comparison of effect sizes of health-related quality of life in patients with coronary artery disease by age at 6 months

SF-36 domains	Effect sizes (95% CI)		P comparing younger than 65 years and older than 65 years
	Younger than 65 years n=111	Older than 65 years n=56	
Physical functioning	0.41 (0.25; 0.57)*	0.63 (0.39; 0.88)*	<0.001
Role limitation due to physical problems	0.29 (0.13; 0.45)*	0.23 (-0.02; 0.47)	-
Role limitation due to emotional problems	0.27 (0.10; 0.43)*	0.27 (0.02; 0.51)*	1.000
Social functioning	0.34 (0.18; 0.50)*	0.33 (0.08; 0.57)*	0.436
Pain	0.95 (0.79; 1.12)*	0.85 (0.60; 1.11)*	<0.001
Mental health	0.21 (0.05; 0.37)*	0.24 (-0.01; 0.48)	-
Energy/vitality	0.27 (0.11; 0.43)*	0.25 (0.01; 0.50)*	0.119
General health perception	0.08 (-0.08; 0.24)	0.21 (-0.04; 0.45)	-
Physical component summary	0.61 (0.45; 0.78)*	0.65 (0.40; 0.90)*	0.002
Mental component summary	0.11 (-0.05; 0.27)	0.15 (-0.10; 0.39)	-

CI, confidence interval.

* $P<0.05$, significant effect sizes.

Table 5. Effect sizes of health-related quality of life in patients who underwent coronary artery bypass grafting (CABG) and percutaneous transluminal coronary angioplasty (PTCA) and experienced myocardial infarction (MI)

	SF-36 domains									
	PF	RPP	REP	SF	P	MH	EV	GHP	PCS	MCS
6 months										
CABG	1.24*	0.73*	0.74*	0.76*	1.43*	0.31*	0.51*	0.12*	1.43*	0.17*
PTCA	0.60*†	0.64*†	0.52*†	0.57*†	1.10*†	0.38*†	0.45*†	0.39*†	0.87*†	0.28*†
MI	0.24*†	0.07*†	0.08*†	0.11*†	0.80*†	0.13*†	0.10*†	0.04*†	0.40*†	0.02*†
1 year										
CABG	1.32*	0.75*	0.78*	0.77*	1.55*	0.30*	0.53*	0.24*	1.49*	0.18*
PTCA	0.40*	0.37*†	0.09*†	0.33*	0.93*†	0.07*†	0.17*	0.13*	0.61*†	-0.01
MI	0.37*	0.15*†	0.19*†	0.30*	0.84*†	0.21*†	0.16*	-0.05	0.51*†	0.06*
1.5 years										
CABG	1.13*	0.84*	0.68*	0.83*	1.59*	0.45*	0.41*	0.24*	1.46*	0.22
PTCA	0.66*†	0.97*†	0.49*†	0.22*	0.91*†	0.12*†	0.34*†	0.41*†	1.04*†	-0.02
MI	0.32*†	0.24*†	0.27*†	0.21*	0.83*†	0.31*†	0.05*†	0.04*†	0.54*†	0.05
2 years										
CABG	1.17*	0.61*	0.63*	0.67*	1.23*	0.10*	0.24*	0.09*	1.40*	-0.03
PTCA	0.82*†	0.81*†	0.27*	0.54*†	1.35*†	0.43*†	0.68*†	0.69*	1.00*†	0.41
MI	0.33*†	0.44*†	0.26*	0.25*†	0.77*†	0.18*†	0.16*†	-0.03	0.62*†	-0.01

* $P < 0.05$ between CABG and PTCA, MI; † $P < 0.05$ between PTCA and MI.

PF, physical functioning; SF social functioning; RPP, role limitations due to physical problems; REP, role limitations due to emotional problems; MH, mental health; EV, energy/vitality; P, pain; GHP, general health perception; PCS, physical component summary; MCS, mental component summary.

tients, but PTCA patients did not improved significantly (Table 3).

Repeated measures two-way analysis of variance revealed a significant impact of treatment method (medication management, PTCA, CABG) on the role limitations due to physical problems ($P=0.031$), general health perception ($P=0.005$), and physical component summary ($P=0.049$) domains. The impact of different follow-up periods was significant on the physical functioning ($P=0.012$), role limitations due to physical problems ($P=0.011$), pain ($P < 0.001$), energy/vitality ($P=0.034$), social functioning ($P=0.015$), role limitations due to emotional problems ($P=0.021$), mental health ($P=0.007$) and physical component summary ($P=0.001$) domains. An association between factors (periods and treatment method) was significant in the physical functioning ($P < 0.001$), role limitation due to physical problems ($P < 0.001$), pain ($P=0.026$), energy/vitality ($P=0.023$), social functioning ($P=0.002$), role limitation due to emotional problems ($P=0.011$), and physical component summary ($P < 0.001$) domains.

The largest effect sizes were seen in the quality of life in the CABG group as compared with the PTCA and MI groups (Table 5). At 6 months, a particularly better improvement was found on the pain, physical functioning, and physical component summary domains, with effect sizes varying from 1.43 to 1.24, meanwhile in MI patients, the effect sizes were smallest. The same trend was seen during other periods of the two-year follow-up: the largest

effect sizes were documented in the revascularized patients' group and the smallest ones in the MI patients who were managed medically.

Discussion

Health-related quality of life in CAD patients improved during the 2-year period. The most considerable improvement was observed at 6 months; in other periods of follow-up, no significant improvement was documented. While assessing the changes in health-related quality of life, authors often point out that the quality of life improved during the first months, but the improvement did not continue over time (10). The greatest change was found in the pain domain, and it shows that pain intensity was reduced and fewer pain-related limitations in daily activities were reported. The variables of mental health changed at least, pointing out that physical health improved better than mental one. In a study by McKee, the changes in quality of life were evaluated in 187 patients recruited to a Phase III cardiac rehabilitation multidisciplinary outpatient program at beginning, end, and 6 months after Phase III cardiac rehabilitation program. There were a considerable number of small effects (≥ 0.2), but only physical role limitation had a moderate effect size (≥ 0.5) from beginning of program to 6 months after it (11).

In our study, gender differences in the changes in health-related quality of life were documented: male patients better improved on the physical component summary domain, and female patients on

the mental health domain. Our findings are consistent with findings of other studies. Brink et al. (12) examined changes in health-related quality of life at 1 year after acute MI and found an improvement in health-related quality of life both for men and women. However, the pattern was somewhat different for women and men. Women mainly reported increased scores on scales reflecting better mental health, whereas men, on the whole, demonstrated higher scores in the physical health domain. Other authors reported that quality of life improved less among women than men (13, 14).

In our study, health-related quality of life in CAD patients improved during the 6-month period regardless of age: it improved in the patients both younger than 65 years and older than 65 years, but older patients showed better improvement on the physical functioning domain. A possible explanation for this finding is that younger patients have higher expectations; therefore, a relatively lower improvement in their quality of life is seen. These observations were in line with the study by Failde and Soto, where younger patients reported lower scores on the physical summary component domain (15). Meanwhile, in a study by Bengston et al. (16), a significant improvement in physical health was found only in patients older than 59 years, and no significant improvement in physical health were observed among younger patients. On the contrary, other researches found that none of the background variables used in the study, such as gender or age, were associated with change in health-related quality of life (17).

Often evaluating the selection of medical treatment or intervention procedures, much attention is paid to changes in health-related quality of life over time. According to our results, the greatest improvement in health-related quality of life was seen among CABG patients as compared to PTCA patients or patients who received only medication treatment. Analogous results were reported by other authors. Muller-Nordhorn et al. (18) examined the changes in quality of life over 6 and 12 months after CABG or acute MI. Health-related quality of life significantly improved in CABG patients, whereas MI patients did not show any improvement. Benzer et al. (1) evaluated the impact of the three established therapeutic strategies – continued medical treatment, PTCA, or CABG – on health-related quality of life over a 12-month follow-up period. The lowest baseline health-related quality of life scores were reported by CABG patients; however, a significantly greater improvement over the 12-month follow-up period was documented in exactly these patients. Our study results showed that at baseline, health-related quality of life in CABG patients was poorest too. Other authors also reported that health-related

quality of life within 1 year was significantly better in patients who underwent revascularization than in patients treated with medical therapy (19). However, other authors pointed out that health-related quality of life in CAD patients might be more strongly influenced by mood disturbance than treatment methods. Hofer et al. (2) found that anxiety and depression accounted for 64% of changes in quality of life, while treatment method – only 1%. Elevated depression symptoms before and after CABG showed an association with lower and worse health-related quality of life at 6-month follow-up (20). Our previous findings also showed that in patients with more severe symptoms of depression and anxiety, health-related quality of life did not change significantly over the 2-year period except for the pain and physical component summary domains (21).

Comparing the impact of PTCA, CABG, or medication therapy on health-related quality of life and assessing which method of treatment has an advantage over another, many difficulties are faced, and often a comparison is not possible due to different baseline conditions. This issue was addressed in a study by Skaggs and Yates (22). They examined the differences of quality of life after PTCA and CABG and found that at baseline CABG patients had more severe disease symptoms than PTCA patients. No differences in quality of life were found at 3 months after hospital discharge between these groups, most probably due to fact that CABG patients who had the worst clinical status at baseline experienced the greatest improvement after 3 months. Therefore, an attempt was made to develop a quality-of-life model adjusted to baseline differences, but in general, these attempts were unsuccessful.

Conclusions

Health-related quality of life significantly improved at 6 months and within the period up to 2 years remained at the same level.

At 6 months, male patients better improved on the physical component summary domain; there were no significant improvements in mental component summary in males and females.

The impact of age on the changes in quality of life was not evident, but older patients better improved on the physical activity and physical component summary domains.

The changes in health-related quality of life were associated with treatment methods: at baseline, the poorest health-related quality of life was documented in patients who underwent coronary artery bypass grafting, but it improved better as compared with patients who experienced myocardial infarction and underwent percutaneous transluminal coronary angioplasty.

Sergančiųjų išemine širdies liga su sveikata susijusios gyvenimo kokybės pokyčiai dvejų metų stebėsenos laikotarpiu

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Raktažodžiai: su sveikata susijusi gyvenimo kokybė, išeminė širdies liga, ilgalaikė stebėseną, pokyčio lygis.

Santrauka. *Tyrimo tikslas.* Išnagrinėti sergančiųjų išemine širdies liga su sveikata susijusios gyvenimo kokybės pokyčius priklausomai nuo amžiaus, lyties ir taikyto gydymo.

Tyrimo medžiaga ir metodai. Tiriamųjų kontingentą sudarė 167 pacientai, po ūminio miokardo infarkto (MI), perkutaninės transluminalinės vainikinių arterijų angioplastikos (PTVAA) arba aortos-vainikinių jungčių operacijos (AVJO), amžiaus vidurkis – 59,3 metų. Pacientai buvo tiriami pradėjus reabilitaciją, po pusės, vienerių, pusantrų ir dvejų metų. Su sveikata susijusi gyvenimo kokybė vertinta naudojant SF-36 klausimyną, gyvenimo kokybės pokyčiai vertinti apskaičiuavus pokyčių lygį.

Rezultatai. Su sveikata susijusi gyvenimo kokybė sparčiausiai pagerėja per pirmuosius 6 mėn., vėlesniais stebėsenos etapais išlieka tokio pat lygio. Didžiausias pokytis nustatytas skausmo vertinimo srityje, statistiškai nereikšmingi pokyčiai – bendros sveikatos vertinimo ir apibendrintos psichinės sveikatos srityse. Atsižvelgiant į lytį, vyrų grupėje didesnis pokytis fizinės sveikatos srityse, moterų grupėje – emocinės būklės srityse. Atsižvelgiant į amžių, vyresnio amžiaus tiriamųjų didesnis pokytis fizinio aktyvumo srityje. Atsižvelgiant į gydymo būdą, pastebėta, jog blogiausia gyvenimo kokybė yra operuotų pacientų, tačiau pokyčių lygis šioje grupėje yra didžiausias.

Išvados. Sergančiųjų išemine širdies liga gyvenimo kokybė, susijusi su sveikata, dvejų metų laikotarpiu pagerėja, sparčiausiai pagerėjimas pastebėtas per pirmąjį pusmetį. Didesnis fizinės sveikatos pagerėjimas pastebėtas vyrų grupėje, o reikšmingo psichinės sveikatos pagerėjimo vyrų ir moterų grupėse neužfiksuota. Vyresnio amžiaus pacientams pastebėtas didesnis fizinio aktyvumo ir fizinės sveikatos rodiklių pagerėjimas. Su sveikata susijusios gyvenimo kokybės pokyčiai, susiję su sergančiųjų išeminės širdies ligos gydymo būdu: pacientų, kuriems AVJO atlikta prieš reabilitaciją, gyvenimo kokybė yra blogiausia, tačiau ji sparčiausiai gerėja lyginant su gyvenimo kokybe pacientų po PTVAA arba po MI.

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