Dynamics of depression symptoms after myocardial infarction: the importance of changes in hope

Aleksandra Kroemeke

The University of Social Sciences and Humanities in Warsaw

Summary

Aim. The mechanism of dynamics of depression symptoms after myocardial infarction (MI) during six months was examined with reference to (a) whether the changes in coping strategies mediate the effect of changes in cognitive appraisal on changes in the level of depression, and (b) whether this mediation is moderated by the changes in hope.

Methods. Cognitive appraisal (threat/harm, challenge), hope, coping strategies (problem-, emotion- and avoidance-focused) and depression were assessed two times among 173 cardiac patients: a few days after first MI and then six months later.

Results. Only emotion-focused coping partly mediated the relationship between changes in threat/harm appraisal and changes in depression (both direct and indirect effects were positive). The effect of changes in challenge appraisal on depression was only direct and negative. Both direct effects were moderated by the level of changes in hope: the associations between changes in appraisal and depression were significant only when hope do not change or decreased in time.

Conclusions. Associations between dynamics of appraisal and depression during six months after MI were more direct and depended on changes in hope.

Keywords: coping, depression, hope

Introduction

The experience of life-threatening disease such as myocardial infarction (MI) is a highly stressful event, which may have serious consequences for the patient's well-being. Relatively frequent reaction to MI are depression symptoms, often sustained for a substantial period of time [1, 2], Nonetheless, connections between depression and cardio-vascular diseases are reciprocal and each of them may contribute risk factor of the other [3]. Depression after MI is accompanied by limited physical activity and cardiac complications, as well as a probability of the next infarction or the growth in mortality rate [1]. Hence, searching for predictors of depression symptoms or changes in their intensity in time in patients after myocardial infarction seems vital. From the point of view of stress theory, determinants may be the appraisal of myocardial infarction, coping with it or having health resources.

In accordance with Lazarus and Folkman, stress is characterized by contextual and processual approach [4]. The key factor is cognitive appraisal, which defines primarily whether the situation is stressful and if so how significant it is for subjects well-being (harm/loss, threat or challenge) [4]. Cognitive appraisal is reflected in patients emotions and activate various ways of counteracting stress, which is the starting point of the process defined as coping. Coping comprises problem-focused behaviours, as well as strategies directed at regulating emotional reactions or avoidance. The effect of these activities on the psychological ground is, nonetheless, emotional functioning of an individual, e.g., their dominant mood.

The research results indicate that a higher level of depression symptoms and generally worse emotional adaptation to the disease is associated with a negative cognitive appraisal of a stressful situation (harm/loss or threat) [5-7] or emotion-focused (not problem-oriented) strategies [6-9]. On the other hand, cognitive appraisal in terms of challenge is associated with life satisfaction [10] and positive emotions [11]. Challenge appraisal is more frequently accompanied by instrumental strategies, whereas negative appraisals by palliative or avoidance ones [10-12], yet other data also reveal positive associations between threat appraisal and problem-focused coping [13].

Confrontation with own somatic disease does not necessarily trigger exclusively the experience of depression and negative affect [14]. It is the hope of recovery or health improvement that frequently accompanies patients. Research results point at relations between hope and a higher quality of life in persons after heart transplant [15], a higher survival rate among patients with various metastatic cancers [16], a lower feeling of depression and anxiety in general population [15, 17-19], or a lower probability of appearance or progression of somatic diseases within two years [20]. Hope also positively correlates with number of cognitive and instrumental strategies, which may be linked with its motivation function [21, 22], thus favouring more effective coping with the disease [18, 23]. According to Folkman, hope constitutes a health resource, which forms a dynamic, reciprocal connection with coping by sustaining and modulating it towards a favourable transactional solution, and vice versa hope is developed and strengthened by coping [24].

Aim of the study

The quoted empirical data explored relations among variables of stress transaction according to statistical procedures, only allowing to indicate significant dependencies between the variables, alternatively influences, but without providing information on dependencies between dynamic changes in these variables in time (how change in time of one variable influences the change of another). The aim of the study was to identify the variables responsible for change in the number of depression symptoms in patients after myocardial infarction in a half-a-year perspective and determine the mechanism of this dynamics. In the first stage, it was verified whether changes in the number of depression symptoms reported by patients are associated with changes in appraisal of myocardial infarction and coping behaviours. In particular, it was tested whether changes in problem-, emotion- and avoidance-focused strategies mediate the

association between the change in cognitive appraisal and the number of depression symptoms. Significant indirect effects were expected in accordance with assumptions concerning the transactional model of stress [cf. 4].

In the second stage, however, it was analyzed whether hope of health improvement and its dynamic in time is a significant moderator of the earlier tested dependencies, thus if direction of changes in hope determines occurrence of indirect and/or direct effects. With an unambiguous definition of hope, it was defined as a current affective state that expresses a feeling of things falling into place with an accompanying uncertainty as to the potential result based on a real view on a particular thing. With respect to the contents, the above view corresponds with Lazarus statement that treats hope as a complex emotion, which co-stimulates positive and negative affective system [25, 26]. Hope (its change) was expected to prove a significant moderator of tested relations. Research reviews allow to assume hope should favour better mental health and be associated with more effective coping in the situation of myocardial infarction.

Methods

Participants and procedure

The sample comprised 173 patients (N_{women} = 52; N_{men} = 121) after first uncomplicated myocardial infarction aged 27 to 67 years (M = 52.92, SD = 7.15). All patients underwent *percutaneous transluminal* coronary angioplasty (PTCA). Before MI the patients did not experience coronary symptoms or other serious somatic or mental diseases. They were mostly in a stable relationship (85.6%), around half the sample had at least secondary education (45%) and were employed before MI (52.6%)[1].

Research recruitment and the first stage (T1) took place during hospitalization, on average on day 5 after MI (N=200). The study was longitudinal, subsequent measurements took place in the post-hospitalization period: a month (T2; N=180) and six months (T3; N=173) after MI (this article only presents data from stage I and III). Missing data were random (Little's MCAR test p = 0,66). The participation in the research was voluntary, the respondents were informed of the longitudinal research procedure and the possibility of withdrawing on each stage. The research was approved by the Ethics Commission.

Measures[2]

Cognitive appraisal was assessed with the Stress Appraisal Questionnaire [27]. Two categories of appraisal was analyzed: threat/harm (α=0.89; 0.93; in T1 and T3 respectively) and challenge appraisal (α=0.73; 0.78). Coping was assessed with the

_____

[1] Retired miners (a privileged group as regards the state pension rate) constituted a substantial percentage of examined patients, which determined educational and professional status layout in the examined group.

[2] Due to a specific character of the study sample for all the tools factor analyses were performed, and based on results, indicators of variables were built. The values of Cronbach's α come from own analyses.

Coping Inventory for Stressful Situation CISS-S by Endler and Parker [28] in the Polish adaptation by Wrześniewski [29] to measure problem-focused (PR; α=0.77; 0.75), emotion-focused (EM; α=0.81; 0.81) and avoidance-focused (AV; α=0.70; 0.65) coping strategies. Symptoms of depression were assessed with Beck Depression Inventory BDI (α=0.87; 0.89) [30, 31]. To assess hope of health improvement *Me and I* Questionnaire by Heszen and Kwissa[3] was applied (α=0.73; 0.83). The tool consists of 10 statements (e.g., *I believe that in the future I will fully recover*) assessed on a five-point Likert scale from *I definitely disagree* to *I definitely agree.*

Statistical analysis

In order to construct the coefficients of change for the analyzed variables in time, standardized residuals of regression were calculated following the regression analysis, where the variable measured six month after MI was the dependent variable, while the one measured at T1 was the independent one [32]. Coefficients obtained in this way were included in the mediation analyses. A multiple mediation and moderated mediation analyses were tested by means of a non-parametric bootstrapping method, using computational macro for SPSS 20 [33]. The method consists in generating a bigger number of samples of the same size as the initial sample through sampling with replacement (in analyses presented N=5000), and then for each sample created identify the confidence interval (CI) whose value of a given parameter in the population is probable to fall into [33]. If the confidence interval for the parameter estimate does not contain zero, the indirect effect is statistically significant. The possibility of parallel testing of several potential mediators and mediation moderators is the advantage of this method. It is also the most frequently used and recommended method for mediation analyses [33].

Results

Descriptive statistics and results of multivariate repeated measures analysis of variance (MANOVA) were presented in Tab. 1 – *next page*. Except for challenge appraisal, the level of all the other variables decreased within six months after MI.

Initial analyses excluded the relationship between controlled variables, such as age, education, romantic relations, having children, employment, angina, pharmacotherapy and smoking, and changes in main variables. Only emotion-focused coping and sex interaction were significant ($F_{[1, 171]}$=3.89; *p*=0.05), thus gender was included as a co-variant for further analyses. Also, the level of depression within T1 was controlled, as well as the indicator of change in the second cognitive appraisal.

What made the number of depression symptoms decrease? – mediation analysis

First, the indirect effect of changes in coping strategies (problem-, emotion- and avoidance-focused) in relationship of changes in negative appraisal and the number of

---

[3] The questionnaire is of experimental nature and examines specific hope (linked with health recovery or improvement). The analyses pointed out its satisfactory psychometric properties, both in cardiac and diabetic patients. For detailed information, please contact the Authors of the tool.

Table 1. **Descriptive statistics and results of MANOVAs (N = 173)**

Zmienne	M_1	SD_1	M_3	SD_3	$F_{(1, 172)}$	p
COG-N	28.24	7.18	22.85	8.87	75.01	< 0.001
COG-P	21.83	3.91	22.22	4.29	0.99	0.321
PR	27.49	5.35	25.70	5.50	20.12	< 0.001
EM	18.00	6.28	15.69	6.09	26.84	< 0.001
AV	14.54	4.97	13.36	4.75	11.48	< 0.001
BDI	10.12	8.23	7.51	7.58	25.04	< 0.001
HOPE	27.52	4.93	26.34	5.99	8.05	< 0.01

Note: COG-N = cognitive appraisal threat/harm; COG-P = cognitive appraisal challenge; PR = problem-focused coping strategies; EM = emotion-focused coping strategies; AV = avoidance-focused coping strategies; BDI = number of symptoms of depression; HOPE = hope of recovery. Index: 1 and 3 = a few days after MI and six months later, respectively.

symptoms of depression were tested, for which partial mediation was obtained. Changes in threat/harm appraisal were positively and directly associated with a change in the number of depression symptoms reported by patients (β=0.21; SE=0.08; p<0.001; the decrease in time of one was accompanied by the decrease of the other and vice versa), and also indirectly (β=0.14; SE=0.04; CI between 0.07 to 0.24 – confidence interval does not contain zero, thus the indirect effect is statistically significant) through changes in emotion-focused strategy (see Table 2. Significant paths from predictor [COG-N] through mediator [EM] to outcome variable [BDI]. Lack of significant relationship between PR-BDI excludes mediation through instrumental coping). Change in threat appraisal was linked with the change of emotion regulating behaviors, which were consecutively linked with the change in the number of depression symptoms 6 months after MI.

An identical test was performed for the dynamics of challenge appraisal. The obtained results indicated the connection of change in challenge appraisal and symptoms of depression had only direct and negative character. In other words, the increase of one was accompanied by the decrease of the other (β=-0.16; *SE*=0.07; *p*<0.05; indirect effect: β=-0.01; SE=0.03; CI between-0.07 to 0.05).

Also, baseline level of depression symptoms (measured directly after MI) was not significantly related to its change rate (or it did not determine the direction of this change; see Table 2 – *next page*). The gender of examined patients anticipated this direction. Namely, the number of depression symptoms in women rose in time.

Were changes in the level of hope meaningful? – moderated mediation analysis

To verify whether indirect effects between the dynamics of cognitive appraisal and the number of depression symptoms depend on the dynamics of hope, an analysis of moderated mediations was performed. Both for the effects of change in the threat/ harm appraisal(for PR: β=0.01; SE=0.01; CI between -0.01 to 0.04; for EM: β=0.03;

Table 2. **Path coefficients in mediation model.**

X	β (SD) →	Mediator	β(SD) →	Y	Model
COG-N T1-T3	0.16(0.07)*	PR T1-T3	-0.12(0.07)		
COG-P T1-T3	0.17(0.08)*				
COG-N T1-T3	0.46(0.07)***	EM T1-T3	0.31(0.08)***		
COG-P T1-T3	0.08(0.07)			BDI T1-T3	R^2adj.= 0.23 $F(8,164) = 6.162$***
COG-N T1-T3	0.11(0.07)	UK T1-T3	-0.10(0.07)		
COG-N T1-T3	0.11(0.08)				
Sex			-0.32(0.15)*		
BDI T1			-0.01(0.01)		

Note: COG-N = cognitive appraisal threat/harm; COG-P = cognitive appraisal challenge; PR = problem-focused coping strategies; EM = emotion-focused coping strategies; AV = avoidance-focused coping strategies; BDI = number of symptoms of depression; T1-T3 = changes of variables in time; Sex: 0-women, 1-men.
 * $p<0.05$; *** $p<0.001$.

SE=0.03; CI between 0.00 to 0.08; for AV: β=-0.01; SE=0.01; CI between -0.06 to 0.00) and challenge (for PR: β=0.01; SE=0.01; CI between 0.00 and 0.04; for EM: β=0.04; SE=0.02; CI between -0.003 to 0.08; for AV: β=0.01; SE=0.01; CI between 0.00 to 0.05), hope proved to be no significant moderator (all CIs contain zero).

The dependence of direct relations between the analyzed variables on the moderator level ($M, \pm 1SD$) was also tested. The results, separately for threat/harm and challenge appraisal, are shown in Table 3. In both cases direct relations between cognitive appraisal and depression symptoms proved significant only for the group where the level of hope decreased six months after MI (at least one standard deviation for standardized residuals of regression; -1 SD) or did not change (for standardized regression residuals M=0, which is interpreted as no change).

Table 3. **Bootstrapped direct effects of changes in cognitive appraisals on changes in number of symptoms of depression at specific values of the moderator (changes in hope in time, HOPE)**

HOPE	Threat/harm appraisal				Challenge appraisal			
	β	SE	t	p	β	SE	t	p
- 1 SD	0.23	0.10	2.30	< 0.05	-0.21	0.10	-2.12	< 0.05
Mean	0.19	0.08	2.39	< 0.05	-0.14	0.07	-1.95	0.05
+ 1 SD	0.15	0.10	1.43	0.153	-0.07	0.10	-0.67	0.50

Discussion and Conclusions

To define the mechanism of dynamics of depression symptoms within six months after MI, it was tested whether change in the coping strategies are a mediator between change in the appraisal of the disease and change in the number of depression symptoms, as well as whether these mediations are moderated through change in the level of hope in patients.

The mediation analysis supported only partly Lazarus and Folkman theory [4] on the mediating role of coping strategies in relation to the cognitive appraisal of transaction and emotional states. Only change in the negative appraisal of MI (threat/harm) proved to be directly and positively associated with the change in the number of depression symptoms; a mediator of this relation was changes in emotion-focused strategies. The interpretation of these results with respect to decreasing the level of variables (according to MANOVAs results) allows to conclude that the decrease in the appraisal of MI as threat was accompanied by the decrease in palliative coping, which was later associated with decrease in time of depression symptoms reported by the patients (analogically: with the increase of negative appraisal, emotional coping increased accompanied by the increase in the number of depression symptoms). Mediation was partial: Positive dependencies between the change in appraisal and the number of depression symptoms were also direct. With respect to the contents, the above results are far from unexpected. There can be usually observed relations of negative affective and cognitive states with the coping activity that focuses on them and is directed at their reductions [6-8]. Contaminations of questionnaire items that measure these changes may be partly responsible (questions such as situation perception in negative categories in KOS, experiencing negative affect in BDI, concentration on negative affect in CISS-S).

Bootstrapping analyses of moderated mediations for the above model, in which changes in the level of hope within six months after MI were tested as the moderator were non-significant. Thus, the mediating role of change in emotion self-regulation in relationship of dynamics of negative cognitive appraisal and depression symptoms was independent on the level of hope (its increase or decrease in time). These dependencies looked different in testing direct effects. Only for the patients for whom there was observed decrease of hope for improving health in time or its level did not change was the threat/harm appraisal directly associated with the dynamics of depression symptoms. Hence, hope can be attributed a protective function. Namely, with its increase, it controls the relation of negative appraisal-negative affect not allowing for a negative spiral to intensify, whereas with its decrease, positive effects between these variables are revealed (increase in threat/harm appraisal was associated with increase in depression symptoms). Interestingly, stability of hope for recovery in the first six months after MI was also deprived of beneficial effects. Consequently, it appears that for optimal adaptation to MI it was not so much relevant how the patients reacted to the situation or whether hope was triggered. If this is the case, how intensive was this emotion and what happened to it within the next months? Was it strengthened and increased or remained stable, rigid or decreased? Myocardial infarction, even though it is of accidental nature in itself, together with short- and long-term consequences form a certain process whose particular stages and phases pose other requirements for patients, are emotionally charged, both diversified and varied in quality and require from patients other adaptation competences. Increase in hope for improving health in patients six months after MI (in comparison to the first days after MI) proves vital for emotional adaptation. All this in time, when sickness benefit expires and consequently

patients take a mutual decision on their further professional activity as well as redefine their social role, life goals and aspirations.

How did challenge appraisal contribute? The effect of change in challenge appraisal of MI on the number of depression symptoms was direct and negative. Namely, increase in challenge appraisal was accompanied by decrease in the number of depression symptoms in time. This association proved to be moderated by simultaneous changes in the level of hope of health improvement. Persons for whom a decrease in experienced hope within six months after MI was observed or for whom its level remained stable, increase in challenge was accompanied by decrease in the number of depression symptoms. In the situation of decrease or lack of change in hope level, challenge cognitive appraisal might have intercepted its protective role. Folkman points at the fact hope is not always present in a difficult situation–it may be high, low or non-existent [24]. It is not an automatically self-renewable resource, but the one that requires care and support. Cognitive coping processes are at least partly responsible for its stimulation e.g., cognitive (positive) reappraisal. It may be assumed that challenge appraisal will contribute too, triggered in the situation of lack of hope or its decrease.

What about other kinds of coping activity? Increase in problem-focused coping after MI was accompanied by increase in challenge appraisal and decrease in threat appraisal (nonetheless these results were non-significant for the patients` dynamics of mood). The obtained dependencies are compatible with those obtained from the correlation or regression analysis [10, 11, 34, 35]. Hence, the thesis on the positive consequences of withdrawal in time of negative cognitive appraisal and intensification of positive appraisal appears to be justified. The dynamics of avoidance-focused strategies, however, did not depend significantly on any of the analyzed variables, which corresponds with the inconclusive data on the role of this way of coping [12, 13, 34, 35].

Interestingly, dynamics of depression symptoms was significantly linked with the cognitive and behavioral changes, unlike the baseline symptom severity, which triggers practical implications: change in beliefs and attitudes participate in change in mood rather than the depth of psychopathology. It is also worth commenting on the fact that direct effects of changes within cognitive appraisals on change in the number of depression symptoms were stronger than the indirect ones that involved coping. This result may stem from the documented dependencies between cognitive and emotional processes [cf. 36]. Differentiating cognitive states from emotional ones on the level of self-description seems nonetheless extremely hard, if not impossible. Hence cognitive appraisal rate may be treated as cognitive appraisal of emotional state. Likewise, the measurement of hope, defined as emotional state, in the item contents refer to its cognitive-relational themes (cognitive aspect of emotions [26]). All this may be treated as a limitation of this research. In psychology of stress and coping, however, the measurement of both cognitive and affective states is impossible but through their subjective appraisal and description by patients. The direct effects were also stronger in threat/harm appraisal models than challenge. It seems that this result relates to a general tendency for the so called negative bias: negativity is more powerful and so stronger manifests itself than positivity one [37].

Nonetheless, the moderating effect of hope on dynamics of cognitive appraisal and depression symptoms was significant. Hope of health improvement proved an important resource that moderates coping in patients after MI and protects them from an increase of experienced depression symptoms. Thus, stimulation, nurturing and strengthening hope among somatically ill patients appears significant not only in the first stage of the disease, but first and foremost in a long-term perspective.

Динамика симптомов депрессии после инфаркта миокарда – значение изменений в надежде больного

Содержание

Задание. Определение динамики симптомов депрессии у пациентов в течение 6 месяцев с определением факта, что изменения в собственной самостоятельности являются медиатором между изменением оценки болезни и изменением в числе симптомов депрессии. Кроме того, является ли степень депрессии и надежды на лучшее модифицируют эти зависимости.

Метод. Мнестическую оценку (угроза/обида, вызов надежды, выробтка поведения (ориентировка в проблеме, эмоции и отчужденность) и симптомы депрессии были оценены у 173 больных после нескольких дней после перенесенного миокарда сердца,а потом после 6 месяцев.

Результаты. Поведение, направленное на эмоции, частично способствовали реляции изменений оценки таких показателей как: угроза/обида и симптомов депрессии (непосредственный и косвенный эффекты – положительные). Эффект изменения оценки – стремление к изменениям в числе симптомов депрессии был только непосредственный и отрицательный. Модератором тестированных реляций были изменения в степени надежды. Непосредственные связи между мнестическими оценками и симптомами депрессии были существенными только у лиц, у которых надежда снизилась, или не претерпела изменений во времени.

Выводы. Связи между динамикой оценки инфаркта и симптомами депрессии были более непосредственными и зависимыми от изменений в степени надежды.

Ключевые слова: самостоятельность ,депрессия, надежда

Dynamik der Symptome von Depression nach Myokardinfarkt – Bedeutung von Veränderungen im Bereich der Hoffnung

Zusammenfassung

Ziel. Bestimmung der Dynamik der Symptome von Depression bei Patienten nach dem Myokardinfarkt während sechs Monaten – mit der Berücksichtigung, ob die Veränderungen in den Coping – Strategien ein Mediator zwischen der Veränderung der Bewertung der Krankheit und der Veränderung in der Zahl der Symptome der Depression sind. Man versucht zu bestimmen, ob der Level der Hoffnung diese Abhängigkeiten moderiert.

Methode. Die kognitive Bewertung (Bedrohung/Schädigung, Herausforderung), Hoffnung, Bewältigungsstrategien (problemorientiert, emotionsorientiert, meidensorientiert) und die Symptome der Depression wurden in der Gruppe der 173 Kranken einige Tage nach dem Infarkt und sechs Monate später bewertet.

Ergebnisse. Emotionsorientiertes Coping nahm teilweise bei der Veränderung der Bewertung Bedrohung/Schädigung und den Depressionssymptomen teil (der direkte und indirekte Effekt positiv). Der Effekt der Veränderung der Bewertung Herausforderung war nur direkt und negativ im Bezug auf die Veränderung in der Zahl der Symptome der Depression. Die Moderatoren der testierten Relationen waren die Veränderungen im Bereich der Hoffnung: direkte Zusammenhänge zwischen den kognitiven Bewertungen und den Symptomen der Depression waren signifikant nur bei den Personen, bei denen die Hoffnung sich in der Zeit nicht verändert hat oder gesunken ist.

Schlussfolgerungen. Die Zusammenhänge zwischen der Dynamik der Bewertung von Infarkt und den Symptomen der Depression waren mehr direkt und von den Veränderungen im Bereich der Hoffnung abhängig.

Schlüsselwörter: Coping, Depression, Hoffnung

La dynamique des symptômes de la dépression après l'infarctus du myocarde – l'importance des changements du niveau de l'espoir

Résumé

Objectif. Présenter la dynamique des symptômes de la dépression après l'infarctus du myocarde (IDM) durant six mois après – pour savoir a/ si les changements des stratégies de se débrouiller sont médiateurs des changements de l'appréciation de la maladie et des changements du nombre des symptômes de la dépression, b/ si le niveau de l'espoir modère ces corrélations.

Méthode. On estime : appréciation cognitive (menace/tort, défit), espoir, stratégie de se débrouiller (stratégies focalisées sur les problèmes, sur les émotions et sur la fuite), symptômes de la dépression de 173 patients après l'infarctus du myocarde – quelques jours après cet IMD et ensuite six mois après.

Résultats. Les stratégies focalisées sur les émotions servent du médiateur partiellement dans les relations des changements de l'appréciation cognitive (menace /tort) et de symptômes des la dépression (effet positif direct et indirect). L'effet du changement de l'appréciation sur le changement du nombre des symptômes est seulement indirect et négatif. Les changements du niveau de l'espoir sont importants – les corrélations des changements de l'appréciation cognitive et des symptômes sont signifiantes seulement chez les personnes dont le niveau de l'espoir a diminué ou n'a pas changé durant le temps.

Conclusions. Les corrélations de la dynamique de l'appréciation de IMD et des symptômes de la dépression sont plus directes et elles dépendent des changements du niveau de l'espoir.

Mots clés : capacité de se débrouiller, dépression, espoir

References

1. van Melle JP, de Jonge P, Spijkerman TA, Tijssen JG, Ormel J, van Veldhuisen DJ, van den Brink RH, van den Berg MP. *Prognostic association of depression following myocardial infarction with mortality and cardiovascular events: a meta-analysis*. Psychosom. Med. 2004; 66: 814–822.

2. Krzyżkowiak W. *Depresja i objawy depresyjne po zawale serca i ich uwarunkowania psycho-społeczne*. Psychiatr. Pol. 2007; 41: 679–691.

3. Dudek D, Siwek M. *Współistnienie chorób somatycznych i depresji*. Psychiatr. 2007; 4: 17–24.

4. Lazarus RS, Folkman, S. *Transactional theory and research on emotions and coping*. Eur. J. Personal. 1987; 1: 141–169.

5. Kennedy P, Evans M, Sandhu N. *Psychological adjustment to spinal cord injury: The contribution of coping, hope and cognitive appraisals*. Psychol. Health. Med. 2009; 14: 17–33.

6. Pakenham KI, Rinaldis M. *The role of illness, resources, appraisal and coping strategies in adjustment to HIV/AIDS: the direct and buffering effects*. J. Behav. Med. 2001; 24: 259–279.

7. Włodarczyk D, Wrześniewski K. *Depresja i wrogość a ocena sytuacji i strategie radzenia sobie u chorych po zawale serca*. W: Kosińska-Sec K, Szewczyk L red. Rozwój, zdrowie, choroba. Aktualne problemy psychosomatyki. Warszawa: BEL Studio; 2004. s. 54–70.

8. Yamasaki K, Sakai A, Uchida K. *A longitudinal study of the relationship between positive affect and both problem- and emotion-focused coping strategies*. Soc. Behav Personal. 2006; 34: 499–510.

9. Lutgendorf SK, Antoni MH, Ironson G, Starr K, Castello N, Zuckerman M, Klimas N, Fletcher A, Schneiderman N. *Changes in cognitive coping skills and social support during cognitive*

behavioral stress management intervention and distress outcomes in symptomatic human immunodeficiency virus (HIV) seropositive gay men. Psychosom. Med. 1998; 60: 204–214.

10. Lequerica AH, Forchheimer M, Albright KJ, Tate DG, Duggan CH, Rahman RO. *Stress appraisal in women with spinal cord injury: supplementary findings through mixed methods*. Int. J. Stress. Manage. 2010; 17: 259–275.

11. McGowan J, Gardner D, Fletcher R. *Positive and negative affective outcomes of occupational stress*. New. Zeal. J. Psychol. 2006; 35: 92–98.

12. Florian V, Mikulincer M, Taubman O. *Does hardiness contribute to mental health during a stressful real-life situation? The roles of appraisal and coping*. J. Pers. Soc. Psychol. 1995; 68: 687–695.

13. Franks HM, Roesch SC. *Appraisals and coping in people living with cancer: a meta-analysis*. Psycho-Oncology. 2006; 15: 1027–1037.

14. Folkman, S. *The case for positive emotions in the stress process*. Anxiety Stress Copin. 2008; 21: 3–14.

15. Evangelista LS, Doering LV, Dracup K, Vassilakis ME, Konashihawa J. *Hope, mood states and quality of life in female heart transplant recipients*. J. Heart. Lung. Transplant. 2003; 22: 681–686.

16. Gottschalk LA. *Hope and other deterrents of illness*. Am. J. Psychother. 1985; 39: 515–524.

17. Elliott TR, Witty TE, Herrick S, Hoffman JT. *Negotiating reality after physical loss: hope, depression and disability*. J. Pers. Soc. Psychol. 1991; 61: 608–613.

18. Feldman DB, Snyder CR. *Hope and the meaningful life: theoretical and empirical association between goal-directed thinking and life meaning*. J. Soc. Clin. Psychol. 2005; 24: 401–421.

19. Shapiro J, McCue K, Heyman E, Dey T, Haller H. *Coping-related variables associated with individual differences in adjustment to cancer*. J. Psychosoc. Oncol. 2010; 28: 1–22.

20. Richman LS, Kubzansky L, Maselko J, Kawachi I, Choo P, Bauer M. *Positive emotion and health: going beyond the negative*. Health Psychol. 2005; 24: 422–429.

21. Dorsett, P. *The importance of hope in coping with severe acquired disability*. Aust. Soc. Work. 2010; 63: 83–102.

22. Snyder CR, Harris C, Anderson JR, Holleran SA, Irving LM, Sigmon ST, Yoshinobu L, Gibb J, Langelle Ch, Harney P. *The will and the ways: development and validation of an individual-differences measure of hope*. J. Pers. Soc. Psychol. 1991; 60: 570–585.

23. Drack-Zahavy A, Someck A. *Coping with health problems: the distinctive relationships of Hope sub-scale with constructive thinking on resource allocation*. Pers. Indiv. Differ. 2002; 33: 103–117.

24. Folkman, S. *Stress, coping and hope*. Psycho-Oncology. 2010; 19: 901–908.

25. Lazarus RS. *Hope: an emotion and a vital coping resource against despair*. Soc. Res. 1999; 66: 653–678.

26. Lazarus RS. *Uniwersalne zdarzenia poprzedzające emocje*. W: Ekman P, Davidson RJ. red. Natura emocji. Gdańsk: GWP; 1999. s. 146–153.

27. Włodarczyk D, Wrześniewski K. *Kwestionariusz Oceny Stresu*. Prz. Psychol. 2010; 53: 479–496.

28. Endler NS, Parker JD. *Assessment of Multidimensional coping: task, emotion and avoidance strategies*. Psychol. Assessment. 1994; 6: 50–60.

29. Wrześniewski K. *Wstępne informacje dotyczące polskiej wersji kwestionariusza CISS-S, N.S. Endlera i J.D.A. Parkera*. Nie opublikowany maszynopis; 2002.

30. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. *An inventory for measuring depression*. Arch. Gen. Psychiat. 1961; 4: 53–63.

31. Parnowski T, Jernajczyk W. *Inwentarz Depresji Becka w ocenie nastroju osób zdrowych i chorych na choroby afektywne (ocena pilotażowa)*. Psychiatr. Pol. 1977; 11: 417–421.

32. Tabachnik BG, Fidell LS. Using multivariate statistics. Boston: Pearson; 2013.

33. Preacher KJ, Hayes AF. *Asymptotic and resampling strategies for assessing and comparing indirect effects in simple and multiple mediator models*. Behav. Res. Methods. 2008; 40: 879–891.

34. Ben-Zur H. *Coping, affect and aging: the roles of mastery and self-esteem*. Pers. Indiv. Differ. 2002; 32: 357–372.

35. Carver ChS, Scheier MF. *Situational coping and coping dispositions in a stressful transac*tion. J. Pers. Soc. Psychol. 1994; 66: 184–195.

36. Kolańczyk A, Fila-Jankowska A, Pawłowska-Pusiara M, Sterczyński, R. Serce w rozumie. Afektywne podstawy orientacji w otoczeniu. Gdańsk: GWP; 2004.

37. Baumeister RF, Bratslavsky E, Finkenauer C, Vohs KD. *Bad is stronger than good*. Rev. Gen. Psychol. 2001; 5: 323–370.