Effective and Ineffective Coping Strategies: Psychometric Properties of a Reduced Version of Brief-COPE For Heart Patients

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Abstract
Negative emotions (like anxiety or depression) have been linked to the onset and development of coronary heart diseases (CHD). Recent research has also shown that the way to deal with these diseases is also a powerful predictor of their prognosis. Moreover, many studies have found that the way in which people face situations is one of the factors that have more influence on their emotional state. Therefore promote an effective coping in these patients is very important to achieve a favorable prognosis. There are valid and reliable measures of coping, but with a large number of items. Therefore the aim of this study was to analyze the psychometric properties of a reduced version of 14 items derived from Brief-COPE (Carver, 1997). One hundred and fifty three patients (85% male; mean age=54.7; SD=8.8) who have just suffered a first cardiac event reported coping strategies used and different emotions experienced both at Time 1 and 2 (8 weeks later). Exploratory factor analysis yields two factors. The first, which accounted for 18.4% of variance, included the effective strategies (active coping, planning, positive reappraisal, acceptance, humor, instrumental social support and distraction). The second (16.7%) was formed by the ineffective strategies (denial, disengagement, substance abuse, venting, self-blame, emotional social support and religion). Subscales derived from these factors reached acceptable internal consistency and high test-retest coefficients. Likewise, effective and ineffective coping showed significant positive correlations with positive and negative emotions respectively. It is concluded that this questionnaire can be used with full warranty in cardiac patients.

Keywords: Effective coping; Ineffective coping; positive emotions; negative emotions; cardiac patients

Introduction

Coronary heart diseases (CHD: basically myocardial infarction and angina) are one of the main causes of death and premature incapacity worldwide (World Health Organization, 2014). Research has shown that the total number of cases cannot be explained by the traditional risk factors such as tobacco addiction, hypertension, high cholesterol levels or obesity. Rather, certain psychosocial factors may influence both the onset and the development of these types of diseases (Everson-Rose & Lewis, 2005).

Among these psychosocial factors, negative emotions (like depression) have shown to have an important role both in the onset (Mittag & Meyer, 2012) and in the development (Meijer et al., 2013) of CHD. Conversely, people who report experiencing more positive emotions exhibit lower rates of stroke and myocardial infarction (Davidson, Mostofsky, & Whang, 2010). Moreover, positive emotions have been associated with greater longevity among patients with CHD (Chida & Steptoe, 2008).

Given the large number of consistent results, there is now agreement that the way how people cope with stressful life events is a primary determinant of their emotional state (Allen & Leary, 2010; Ben-Zur, 2009; Folkman, 2008). Lazarus himself (2006) said that coping always refers to efforts to manage adaptive demands and emotions that are generated, and therefore, coping can be considered as an integral feature of the emotional process.

In this sense, many studies with heart patients have shown the same pattern of results than in healthy people, i.e., that coping strategies focused on problem solving (such as active coping and planning) and those based on a positive cognitive restructuring (such as positive reevaluation or acceptance) were associated with fewer symptoms of depression and anxiety, while the use of coping strategies focused on avoidance (such as disengagement, substance use, venting or denial) increased these symptoms (Allman, Berry, & Nasir, 2009; Sanjuán, Arranz, & Castro, 2012).

Recent research has also shown that the use of the most effective coping strategies is associated with a better prognosis of the disease among heart patients (Chiavarino et al., 2012; Roohafza, Talaei, Pourmoghaddas, Rajabi, & Sadeghi, 2012; Svensson et al., 2016). Thus, progression of chronic stable angina to acute coronary syndrome was inversely related with the use of the problem solving and positive cognitive restructuring coping strategies (Roohafza et al., 2012). Moreover, in these patients, the use of coping strategies focused on avoidance immediately after the occurrence of cardiac event was the only significant predictor of disease severity (measured by left ventricular ejection fraction, which is a reliable prognostic index of disease severity) three months later (Chiavarino et al., 2012).

In a recent study with a follow-up period of 8 years, it has been found that the use of active coping strategies was inversely associated with the incidence and mortality of cardiovascular disorders (Svensson et al., 2016). Moreover, this study also found that among people with hypertension, the use of avoidance coping was associated with

increases in mortality from CHD, whereas it was reduced with the use of positive reappraisal.

Taken together, all these findings suggest that promote an effective coping in these patients is very important to achieve a favorable prognosis. There are valid and reliable measures of coping, but these are too extensive for patients who have recently suffered a cardiac event. Therefore the main objective of this study was to analyze the psychometric properties of a reduced version of 14 items derived from Brief-COPE (Carver, 1997) for cardiac patients. Furthermore, given the intrinsic relationship between coping and emotion, and the great importance that these two factors have on the prognosis of these patients, another of our objectives was to identify broad coping categories based on their associations with positive and negative emotions.

Method

Participants and procedure

Patients who have just suffered a first cardiac event were recruited in Cardiac Rehabilitation Unit (CRU). Each patient who met the inclusion criterion of having suffered their first acute cardiac episode was verbally offered the opportunity to participate in this study. One of the authors interviewed patients who chose participate to collect sociodemographic data and rule out psychiatric disorders. Patients were included in this study only if they had no history of psychotic symptoms and did not suffer from any cognitive deterioration. Patients with other serious chronic diseases (diabetes, cancer, rheumatoid arthritis, etc.) were excluded before referral to the CRU. The hospital's bioethics committee approved the protocol, and voluntary written informed consent was obtained from each participant following the initial interview.
In Table 1 can be seen the sociodemographic characteristics of the patients enrolled in the study.

Table 1. Sociodemographic characteristics of patients

	Time 1	Time 2
n	153	96
Gender (% male)	85	83,3
Age, [mean (SD)]	54,7 (8,81)	57,74 (8,57)
Time since diagnosis [mean (SD)]	32,02(32,70)	34,65 (36,78)
Occupational status (% of patients employees prior cardiac event)	57,5	61,5
Coexistence type (% of patients living with their family)	90,8	89,6
Education (% of patients with		
elementary	26,8	26
secondary	30,7	34,4
and higher education)	42,5	39,6

Measures

At Time 1 the patients were assessed using the following measures:
Brief COPE Scale (Carver, 1997). In agreement with the current study proposals, we employed a short version of this questionnaire proposed for cardiac patients by

Eisenberg, Shen, Schwarz y Mallon (2012), made up of 14 items. The scale evaluates 14 different strategies used to cope with difficulties on a 7- point Likert type scale where "0" is "nothing at all" and "6" equals "totally" according to the degree to which the participants employ each one of the strategies set out in the items. According to the objectives of this study, patients were asked to answer this scale also at Time 2, 8 weeks later.

Depressive Symptoms Subscale of Symptoms Check List Revised (SCL-90-R; Derogatis, 1977): This subscale contains 13 items that assess affective, cognitive, and behavioral components of depressive symptoms. Participants were asked to report how they felt over the past week on a 7-point Likert-type scale ranging from "0" ("Nothing") to "6" ("Very much"). Total score was computed by averaging all the items of scale. High scores on this subscale indicate greater depressive symptoms. In the current sample, the alpha coefficient was .91

Positive and Negative Affect Scales (PANAS; Watson, Clark & Tellegen, 1988): This is a 20-item measure that assesses 2 dimensions: positive affect (10 items) and negative affect (10 items). Participants were asked to report how they had felt in the previous week on a 7-point Likert scale. Positive and negative affect scores were computed by averaging items of positive or negative affect subscales respectively. Higher scores on the positive and negative affect subscales indicated greater experience of positive and negative emotions, respectively. In the current sample, the alpha coefficients for positive and negative affect were .89 and .87 respectively

Results

Since one of our main goals was to identify the broad coping categories that are associated with positive and negative emotions, we first calculate the correlations of each of the 14 coping strategies evaluated by the shortened version of Brief-COPE with different emotional measures (depressive symptoms and positive and negative affect). In Table 2 are shown these correlations.

As we can see, some coping strategies are positively associated with positive affect (such as active coping, planning, positive reframing, instrumental social support and distraction), while others are positively related to measures of negative emotions (such as religion, emotional social support, denial, substance use, behavioural disengagement, self-blame and venting). In addition, other strategies maintain both positive relationships with positive affect and negative associations with negative emotions (such as acceptance and humour).

In order to know the broad coping categories assessed by the scale, we conducted an exploratory factor analysis (EFA). Since the sample consisted of 153 participants and scale has 14 items, the criterion advised of 5:1 with respect to sample size required to perform the EFA was exceeded (Martinez, Gázquez, & Sousa, 2012). EFA was carried out with all the items of the shortened version of Brief-COPE, using a principal components method with Varimax rotation (Kaiser normalization). Bartlett's Test of Sphericity, which was statistically significant (χ^2=470.50, *df*=91, *p*<.001), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, which exceeded the minimum requirement of .5 (KMO=.66), showed the suitability of the current data for

factor analysis. As we can see in Table 3, four factors, with eigenvalues greater than 1, were obtained.

Table 2. Correlations between all the items of the shortened version of Brief-COPE and different emotional measures (n=153)

	Positive Affect	Negative Affect	Depressive Symptoms
1. Active Coping	.39***	.10	-.05
2. Planning	.32***	.11	-.03
3. Positive Reframing	.42***	-.03	-.10
4. Acceptance	.32***	-.39***	-.34***
5. Humour	.24**	-.19*	-.18*
6. Religion	-.10	.20**	.14°
7. Emotional Support	-.00	.28***	.18*
8. Instrumental Support	.16*	.14°	-.06
9. Self-Distraction	.22**	.13	.01
10. Denial	-.07	.34***	.31***
11. Venting	-.20**	.34***	.30***
12. Substance use	-.13	.28***	.26***
13. Behavioral Disengagement	-.05	.19**	.12
14. Self-blame	-.11	.19**	.25**

^{o} p=.08   * p <.05   ** p<.01   *** p<.001

To assign items to the factors, we follow the criteria of retaining saturations above .35 and avoid, if possible, negative factor loadings (Williams, Brown, & Onsman, 2010).

Except for the Factor 1, which includes strategies focused on problem solving and positive reappraisal, which reached a good internal consistency coefficient (.82) (George & Mallery, 2003), the other factors did not reach acceptable alpha coefficients (.62, .41 and .54 for Factors 2, 3 and 4 respectively) (Nunnaly, 1978).

In addition to this issue of low internal consistency of some factors, which is a criterion to be taken into account to maintain a factor (Williams et al., 2010), we must note that some items (denial or venting) loaded on two factors, being their negative saturation greater than the positive one. Therefore, taking into account the pattern of correlations found, and since one of our main objectives is to know the broad coping categories that can predict positive and negative emotions, we decided to force a two-factor solution. Results of this analysis are shown in Table 4.

As we can see, all the coping strategies associated with positive emotions loaded on the first factor and those that were related to negative emotions did it in the second factor.

Table 3. Results of Exploratory Factor Analysis conducted with all the items of the shortened version of Brief-COPE (n=153)

	Factor 1	Factor 2	Factor 3	Factor 4
1. Active Coping	**.88**	-.02	.01	-.10
2. Planning	**.88**	.00	-.07	-.05
3. Positive Reframing	**.78**	.16	.23	.13
4. Acceptance	.03	.13	**.82**	-.04
5. Humour	.14	-.01	**.58**	.13
6. Religion	-.06	**.77**	.15	.11
7. Emotional Support	-.05	**.80**	-.12	.03
8. Instrumental Support	.20	**.66**	-.01	-.05
9. Self-Distraction	.34	**.39**	-.19	-.33
10. Denial	.10	.08	-.59	**.39**
11. Venting	.07	**.40**	-.54	.31
12. Substance use	-.03	-.00	-.08	**.71**
13. Behavioral Disengagement	.02	.09	-.23	**.63**
14. Self-blame	-.04	-.02	.10	**.58**
Eigenvalue	2.38	2.04	1.85	1.65
% of variance	17.02	14.58	13.20	11.81
Acumulated % of variance	17.02	31.60	44.80	56.61

Table 4. Results of Exploratory Factor Analysis (two-factor solution) conducted with items of the shortened version of Brief-COPE (n=153)

	Factor 1	Factor 2
1. Active Coping	**.78**	-.25
2. Planning	**.78**	-.16
3. Positive Reframing	**.76**	-.17
4. Acceptance	**.50**	.11
5. Humour	**.35**	.12
6. Religion	.30	**.35**
7. Emotional Support	.32	**.50**
8. Instrumental Support	**.49**	.26
9. Self-Distraction	**.50**	.07
10. Denial	.09	**.62**
11. Venting	.21	**.70**
12. Substance use	-.07	**.43**
13. Behavioral Disengagement	.21	**.70**
14. Self-blame	-.07	**.43**
Eigenvalue	2.58	2.34
% of variance	18.40	16.73
Acumulated % of variance	18.40	35.14

In accordance with the results of the latter factor analysis two scores labelled as effective and ineffective coping were computed by averaging item scores corresponding to items which were included in each of these two factors.

Reliability coefficients (internal consistency and temporal stability) of the two subscales of the coping questionnaire are shown in Table 5.

Table 5. Psychometric characteristics of the shortened version of Brief-COPE

	α Time 1 (n=153)	α Time 2 (n=96)	r T1-T2 (n=96)
Effective Coping	.75	.70	.53***
Ineffective Coping	.71	.69	.53***

*** p<.001

As we can see, effective and ineffective coping categories achieved acceptable internal consistency coefficients at Time 1, and acceptable or sufficient respectively at Time 2 (Nunnaly, 1978).

In order to analyse the criterion validity, we calculated the correlations between the two coping categories and different emotional measures (positive and negative affect and depressive symptoms), that can be seen in Table 6.

Table 6. Correlations between coping strategies and emotional measures (n=153)

	Effective Coping	Ineffective Coping
Positive Affect	.52***	-.17*
Negative Affect	-.06	.47***
Depressive Symptoms	-.22**	.40***

*p <.05   ** p<.01   *** p<.001

Effective coping category are positively associated with positive affect and negatively related to negative emotions (depressive symptoms), while the ineffective coping category showed the opposite pattern of correlations.

Conclusions

The main objective of this study was to analyze the psychometric properties of a reduced version of 14 items derived from Brief-COPE (Carver, 1997) for cardiac patients. Moreover, since coping always refers to efforts to manage adaptive demands and emotions that are generated, and the great importance that coping and emotions have on the prognosis of these patients, we also wanted to know the pattern of associations between different broad categories of coping and emotional measures.

The results have shown that in the shortened version of Brief-COPE for heart patients two broad coping categories can be distinguished, which according to their ability to predict positive or negative emotions, we have labeled as effective and ineffective coping strategies respectively.

These subscales show adequate reliability, both in terms of internal consistency and temporal stability (George & Mallery, 2003). In addition, since these subscales remain high correlations with emotional measures in line with expectations, it can be said that the questionnaire has good criterion validity. Taken together, these results suggest that the questionnaire can be used with full warranty in cardiac patients.

Since emotion and coping are closely linked (Ben-Zur, 2009; Lazarus, 2006), and both factors play an important role in the prognosis of cardiac patients (Chida & Steptoe, 2008; Meijer et al., 2013; Svensson et al., 2016), it would be recommended that patients using the most ineffective strategies could be detected as soon as

possible, which would allow us to intervene to promote the use of a more adaptive strategies. The fact that this reduced version of Brief-COPE has only 14 items greatly facilitates this task.

References

Allen, A. & Leary, M. (2010). Self-compasion, stress, and coping. *Social and Personality Psychology Compass, 4,* 107-118.

Allman, E., Berry, D., & Nasir, L. (2009). Depression and coping in heart failure patients: A review of the literature. *Journal of Cardiovascular Nursing, 24,* 106-117.

Ben-Zur, H. (2009). Coping styles and affect. *International Journal of Stress Management, 16,* 87-101.

Carver, C. S. (1997). You want to measure coping but your protocol's too long: Consider the Brief COPE. *International Journal of Behavioral Medicine, 4,* 92-100.

Chiavarino, C., Rabellino, D., Ardito, R., Cavallero, E., Palumbo, L., Bergerone, S., Gaita, F., & Bara, B. (2012). Emotional coping is a better predictor of cardiac prognosis than depression and anxiety. *Journal of Psychosomatic Research, 73*, 473–475.

Chida, Y. & Steptoe, A. (2008). Positive psychological well-being and mortality: A quantitative review of prospective observational studies. *Psychosomatic Medicine, 70*, 741-756.

Davidson, K., Mostofsky, E., & Whang, W. (2010). Don't worry, be happy: Positive affect and reduced 10-year incident coronary heart disease: The Canadian Nova Scotia Health Survey. *European Heart Journal, 31*, 1065–1070.

Derogatis, L.R. (1977). *SCL-90-R, administration, scoring and procedures. Manual for the R(evised) version*. Baltimore: Johns Hopkins University, School of Medicine.

Eisenberg, S., Shen, B., Schwarz, E., & Mallon, S. (2012). Avoidant coping moderates the association between anxiety and patient-rated physical functioning in heart failure patients. *Journal of Behavioral Medicine, 35*, 253-261.

Everson-Rose, S., & Lewis, T. (2005). Psychosocial factors and cardiovascular diseases. *Annual Review of Public Health, 26*, 469-500.

Folkman, S. (2008). The case for positive emotions in the stress process. *Anxiety, Stress, and Coping, 21,* 3-14.

George, D., & Mallery, P. (2003). *SPSS for Windows step by step: A simple guide and reference. 11.0 update.* Boston: Allyn & Bacon.

Lazarus, R. (2006). Emotions and interpersonal relationships: Toward a person-centered conceptualization of emotions and coping. *Journal of Personality, 74*, 9-46.

Martínez, F., Gázquez, J., y Sousa, C. (2012): Structural Equation Modeling in marketing and business research: Critical issues and practical recommendations. *European Journal of Marketing, 47,* 1–33.

Meijer, A., Jan Conradi, H., Bos, E. H., Anselmo, M., Carney, R. M., Denollet, J. ... de Jonge, P. (2013). Adjusted prognostic association of depression following myocardial infarction with mortality and cardiovascular events: Individual patient data meta-analysis. *The British Journal of Psychiatry, 203*, 90-102.

Mittag, O., & Meyer, T. (2012). The association of depressive symptoms and ischemic heart disease in older adults is not moderated by gender, marital status or education. *International Journal of Public Health, 57*, 79-85.

Nunnaly, J. (1978). *Psychometric theory.* New York: McGraw-Hill.

Roohafza, H., Talaei, M., Pourmoghaddas, Z., Rajabi, F., & Sadeghi, M. (2012). Association of social support and coping strategies with acute coronary syndrome: A case–control study. *Journal of Cardiology, 59*, 154-159.

Sanjuán, P., Arranz, H. & Castro, A. (2012). Pessimistic attributions and coping strategies as predictors of depressive symptoms in people with coronary heart disease. *Journal of Health Psychology, 17*, 887-896.

Svensson, T., Inoue, M., Sawada, N., Yamagishi, K., Charvat, H., Saito, I., Kokubo, Y., Iso, H., Kawamura, N., Shibuya, K., Mimura, M., & Tsugane, S. (2016). Coping strategies and risk of cardiovascular disease incidence and mortality: The Japan Public Health Center-based prospective Study. *European Heart Journal.*

Watson, D., Clark, L.A. & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect. The PANAS scales. *Journal of Personality and Social Psychology, 54,* 1063-1070.

Williams, B., Brown, T., y Onsman, A. (2010). Exploratory factor analysis: A five-step guide for novices. *Australian Journal of Paramedicine, 8,* 1-13.

World Health Organization, WHO (2014). *The 10 leading causes of death in the world, 2000 and 2012. World Health Organization.* Downloaded from: http://www.who.int/mediacentre/factsheets/fs310/en/

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