



Associations of baseline depressed mood and happiness with subsequent well-being in cardiac patients



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ARTICLE INFO

Article history:

Received 22 February 2016

Received in revised form

22 November 2016

Accepted 8 December 2016

Available online 29 December 2016

Keywords:

Positive psychology

Cardiovascular health

Health-related quality of life

ABSTRACT

Rationale: The relationship between depressive symptoms and adverse outcomes for patients with cardiac problems has been well established for several decades. However, less is known about other factors that may influence psychosocial outcomes for cardiac patients.

Objective: To evaluate the association between baseline happiness and depressed mood on later psychosocial functioning among cardiac patients.

Method: Participants ($N = 250$) were patients who had received medical treatment at an academic medical center for a cardiac event. Participants completed questionnaires at two time points: Approximately 2 weeks after they had been discharged from the hospital (baseline) and again 12 weeks later. Participants completed validated measures of depressed mood, happiness, health distress, expectations about health, and quality of life.

Results: Baseline depressed mood and happiness both significantly predicted health-related distress and depressive symptoms at follow up. Happiness ratings were associated with lower distress and depressed mood, whereas scores for depressive symptoms showed the opposite pattern. Happiness, but not depressed mood, was a significant predictor of more positive quality of life ratings. Conversely, only depressed mood was a significant predictor of less positive expectations about health.

Conclusion: The results of this study suggest that investigating positive baseline affect in addition to depressed mood provides additional useful information that may help explain why some patients have more negative outcomes following cardiac events.

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Cardiovascular events have the highest rates of both mortality and disability in the United States, and are the number one cause of death globally. In 2012, 17.5 million people around the world died from cardiovascular diseases, of which 7.4 million were due to coronary heart disease and 6.7 million due to stroke (World Health Organization, 2015). Fortunately, many cardiovascular risk factors are modifiable, both before and after a cardiac event occurs. Behavioral risk factors, including tobacco use, obesity, unhealthy diet, physical inactivity, and problematic alcohol use, can be addressed preventively, leading to decreased likelihood of cardiac problems. These risk factors can also be modified following a

cardiovascular event in order to decrease risk of subsequent events and adverse outcomes (e.g., Chatziefstratiou et al., 2013). Furthermore, adherence to medical recommendations following a cardiac event greatly reduces risk of future cardiac events and other health outcomes (Howell et al., 2013). However, it is difficult for many cardiac patients to initiate the recommended behavioral and lifestyle modifications, and adherence is often problematic (Taylor et al., 2011), which may be related to barriers to participation, such as lack of access to health resources and psychological factors, including mood and expectations about health and survival (Daly et al., 2002; Howell et al., 2013).

A large body of research suggests that depression is a risk marker for morbidity and mortality (e.g., Gan et al., 2014). Individuals with depression are not only more likely to develop cardiac problems; they also experience poorer outcomes following a cardiovascular event compared to non-depressed cardiac patients.

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For example, the results of a meta-analysis of prospective cohort studies found that depression was associated with a 30% increased risk for coronary heart disease and myocardial infarction, independent of traditional cardiac risk factors, such as hypertension, diabetes, and body mass index (Gan et al., 2014). Less is known, however, about the potential contributions of positive well-being and quality of life factors on cardiac outcomes. This gap is important because research indicates that positive health/mood attributes are associated with cardiovascular benefits above and beyond the absence of distress or psychiatric disorder and after controlling for relevant sociodemographic factors (for review, see DuBois et al., 2012). For example, the relationship between dispositional optimism and more positive cardiac health is well-established in several studies (Scheier et al., 1989; Tindle et al., 2010). Furthermore, greater self-reported vitality is associated with better cardiac health outcomes (Richman et al., 2009). Patients with more positive expectations for recovery and survival also experience improved outcomes compared to those with negative expectations, which may be related to adherence to medical recommendations (Howell et al., 2013). In addition, the results of one study demonstrated that higher positive affect scores based on observer-coded interviews were associated with lower risk for coronary heart disease across a 10-year time period (Davidson et al., 2010). Accordingly, positive affect and quality of life factors may provide unique contributions to the understanding of cardiovascular risk and outcomes. The current study examines the possible unique contributions of depressive symptoms and happiness on psychosocial outcomes 12 weeks after treatment among patients who have already experienced a cardiac event.

1. Method

1.1. Participants and procedures

Participants in this study included 250 patients who received treatment at the Mayo Clinic in 2007–2008 for a cardiac event (e.g., myocardial infarction, coronary artery bypass surgery). Patients who were identified as eligible based on patient census records were sent a recruitment packet by mail approximately two weeks after discharge from the hospital and those who responded were sent a second survey packet 12 weeks later. For inclusion, individuals had to be 18 years or older, able to read English, and had recently experienced a cardiac event. Patients provided informed consent as part of the study packet and received compensation in the form of a book about healthy living. Institutional review board (IRB) approval was obtained at the Mayo Clinic. Participants received the same questionnaires at both time points.

Of the 862 individuals who were mailed packets, 323 responded and agreed to participate (37% response rate), and 250 completed both time points and were included in the final sample. Participants reported an average age of 69.13 years ($SD = 10.7$) with 14.1 ($SD = 3.6$) years of education. Most participants were male (70%), Caucasian (97.6%), and married (76%).

1.2. Measures

Positive affect was assessed using the Happiness Survey (HI/P 6.1.2; Foster and Hicks, 2009), a 10-item measure of dispositional happiness and well-being. Each item is rated on a scale from 0 (strongly disagree) to 10 (strongly agree), with higher scores indicating greater levels of happiness (e.g., “I do the things that make me most happy”). The measure is scored by adding each item to generate a total score of 0–100. Published psychometric data was not available for this survey; however, our analyses suggest high internal consistency ($\alpha = 0.92$) and evidence of construct validity

based on significant negative correlation when compared to depressive symptoms (Pearson's $r = -0.285$, $p < 0.001$). Consistent with the currently study hypotheses, only baseline happiness was included in analyses.

Depressed mood was assessed with the Patient Health Questionnaire – 9 (PHQ-9; Kroenke and Spitzer, 2002), a widely-used 9-item measure of depressive symptoms with high internal consistency and test-retest reliability (for review of psychometric properties, see Blackwell and McDermott, 2014). The PHQ-9 items are scored on a scale from 0 (not at all) to 3 (nearly every day), and items are added to generate a total score. Higher scores represent greater depressive symptomology, with cutoff scores of 5 (mild), 10 (moderate), 15 (moderate to severe), and 20 (severe). For the current study, $\alpha_s = 0.82$ and 0.84 across the two time points.

The Health Distress Questionnaire (Lorig et al., 1996) was used to measure distress related to health problems, and includes 4 items. This measure assesses time spent feeling discouraged, worried, fearful, and frustrated by health problems over the past month. This brief scale is a modified version of the Medical Outcomes Study (MOS) health distress scale (Stewart et al., 1992). Items are rated on a 0-to-5 scale, with higher scores indicating higher distress levels, and the scale score is the average of the items. This scale has been used in prior research (e.g., Lorig et al., 2001) and has evidence of good psychometric properties (Lorig et al., 1996). For the current study, internal consistency was high across the two time points ($\alpha_s = 0.89$ and 0.92).

Quality of life was assessed using a single item: “During the past week, including today, how would you describe your overall quality of life?” This item is rated on a 0-to-10 scale. Prior research has compared a single quality of life item to a summative scale and suggests that use of a single item is appropriate for obtaining a global impression of a construct (Sloan et al., 2002).

Finally, expectations about health and survival were assessed using the Positive Expectations about Health Scale (Leedham et al., 1995). This scale contains 7 items, which are rated on a scale from 1 (e.g., not at all confident) to 7 (e.g., extremely positive). The total score is the sum of the items, and higher scores represent a more positive outlook. Psychometric evaluation suggested adequate reliability and a single robust factor (Leedham et al., 1995). In the current sample, internal consistency was high ($\alpha_s = 0.91$ and 0.92).

1.3. Statistical analyses

Statistical analyses were conducted using a multiple quantile regression analysis (median) using demographic variables (age, education, gender, and marital status), baseline scores of the follow up variable of interest, baseline depressed mood, and happiness scores as predictor variables. Accordingly, the results below examine how much more baseline depressive symptoms and happiness predict well-being over and above demographic factors and baseline functioning. Inspection of the data revealed violations of normality for all outcome variables, which was assessed by computing residuals from standard linear models and creating normal probability plots from the residuals. Quantile regression was chosen because of the non-normality of the outcome variables, given that this analysis does not assume normality. Accordingly, median scores are used instead of mean scores, and results are kept on the original scale of the outcome variables. No imputation was conducted given that the amount of participants in each model is adequate for the number of predictors (i.e., <10% missing). Follow-up scores (i.e., 12-week scores) for depressive symptoms, positive expectations about health, health distress, and quality of life were entered as outcome variables in analyses. Statistical analyses were conducted using SAS version 9.4 (Cary, NC, USA).

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