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Positive psychological states and health behaviors in acute coronary syndrome patients: A qualitative study

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Abstract

Positive psychological states are linked to superior cardiac outcomes, possibly mediated through increased participation in health behaviors. Trained study staff conducted in-depth semi-structured interviews in the hospital and three months later for 34 patients diagnosed with an acute coronary syndrome. These interviews focused on positive psychological states, cardiac health behaviors, and their connection; the interviews were transcribed and independently coded using directed content analysis. Both optimism and positive affect were associated with completion of physical activity and healthy eating in a bidirectional manner. In contrast, gratitude, while common, was infrequently linked to completion of health behaviors.

Keywords

Coronary heart disease; optimism; health behavior; adherence; qualitative methods

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Declaration of conflicting interests

The authors declare that there are no conflicts of interest.

Supplementary Table 1. Relevant portions and sample questions from semi-structured qualitative interview guide
Supplementary Figure 1. Model of relationships between positive states and selected health behaviors
Supplementary Figure 2. Study enrollment flow chart
Supplementary Figure 3. Frequencies of expressed positive psychological states during interviews

Each year, 2.5 million persons are hospitalized for acute coronary syndrome (ACS; myocardial infarction [MI] or unstable angina [UA]) (Grech and Ramsdale, 2003). Among post-ACS patients, 20% will be re-hospitalized for ischemic heart disease within the next year (Menzin et al., 2008), and approximately the same proportion will die within a year of their initial event (Kolansky, 2009). Healthy behavior can play a major role in preventing these potentially lethal recurrent events. Indeed, ACS patients who increase physical activity, follow a low-fat diet, and adhere to medication are substantially less likely to suffer recurrent events or mortality (Chow et al., 2010; Gehi et al., 2007). However, despite the clear importance of health behaviors following an ACS, the majority of patients do not adhere to these medical recommendations in the year post-ACS. (Roger et al., 2011) (Chow et al., 2010; Sud et al., 2005).

Psychological factors may play a key role in the poor adherence of this population. Depressive symptoms and anxiety have been linked to non-adherence to diet, physical activity, medication, and other key secondary prevention measures in ACS patients (De Jong et al., 2011; Roest et al., 2010; Ziegelstein et al., 2000). In qualitative studies, cardiac patients have described that depression amplifies negative beliefs about their health and that it reduces interest and motivation to complete physical activity (Rogerson et al., 2012; Steca et al., 2013).

Conversely, optimism, well-being, and other positive psychological states have been independently associated with fewer hospital readmissions and reduced mortality in patients with heart disease (Chocron et al., 2000; Konstam et al., 1996; Steptoe et al., 2009). Importantly, the benefits of positive psychological states also appear to be independent of the effects of depression and other negative affective states on outcomes (Lyubomirsky et al., 2005; Chida and Steptoe, 2008). The links between positive states and cardiac outcomes may be mediated by health behaviors. In studies of persons without heart disease, optimism and related attributes have been associated with greater adherence to cardiac health behaviors (Schnohr et al., 2005; Steptoe et al., 2009; Steptoe et al., 2006), including following a heart-healthy diet (Kelloniemi et al., 2005; Giltay et al., 2007), and being physically active (Browning et al., 2009; Steptoe et al., 2006)

However, despite the prevalence and importance of this cardiac condition, there has been limited work examining positive states in patients suffering an ACS. A small number of prior studies have examined specific positive psychological states in post-ACS patients (Daly et al., 1999; Laerum et al., 1987; Laerum et al., 1988; Norekval et al., 2008); these studies have generally had small sample sizes and focused on a relatively limited scope of positive states (e.g., single questions about positive experiences).

Furthermore, we are aware of no prior studies examining associations between positive states and cardiac health behaviors following ACS. Indeed, nearly all studies connecting positive states to health behaviors occurred in healthy cohorts, aside from a single study of optimism in patients undergoing a heart transplant (Leedham et al., 1995). This is an important gap in the literature given the vital role of health behavior adherence in post-ACS prognosis and the known links between positive states and healthy behavior.

Several key questions remain unanswered: 1) Which specific positive psychological states are commonly experienced over the three months post-ACS? 2) Do—and which—positive states increase the likelihood of completing cardiac health behaviors? 3) Conversely, does participation in health behaviors lead to more positive thoughts and feelings? To address these questions, we conducted in-depth semi-structured interviews in patients during their hospitalization for ACS and three months later to explore positive psychological states in this population and examine links between these states and cardiac health behaviors that are associated with increased post-ACS survival. To comprehensively evaluate these positive states, the interviews and corresponding analysis focused specifically on positive cognitions and emotions rather than focusing more diffusely on all psychological experiences.

Methods

Design

Semi-structured interviews were conducted by trained qualitative interviewers in the hospital (timepoint 1; T1) and three months post-discharge (T2) among patients hospitalized for an ACS. All study procedures were approved by our healthcare system's Institutional Review Board before study initiation, and all participants provided written consent. This study was registered with clinicaltrials.gov (identifier NCT01807442).

Study criteria and recruitment—Patients were recruited in a purposive manner from three adult inpatient cardiac units at an urban academic general hospital from March 2013 to August 2013. Eligible patients were English-speaking adults hospitalized for an ACS (MI or UA). For MI, patients were required to meet two of three World Health Organization criteria (European Heart Journal, 2000) for MI (typical chest pain, elevated cardiac enzymes, and electrocardiographic changes consistent with myocardial infarction). As per prior trials (Huffman et al., 2013; Theroux and Fuster, 1998), UA was defined as new-onset angina within the past two months, exacerbation of previous angina with rest pain or minimal exercise, or angina within two weeks of MI. We excluded ACS patients found to have cognitive deficits assessed using a six-item cognitive screen (Callahan et al., 2002) or medical conditions that precluded completion of interviews.

To recruit participants, study staff reviewed patient censuses each weekday. For potentially eligible patients, the patient's medical clinician inquired about his or her willingness to hear about an optional study, and if the patient agreed, study investigators explained the study, assessed for all study criteria, and obtained written informed consent.

Data collection

Participant characteristics and quantitative assessment of health behavior—Prior to qualitative interviews, participants completed an assessment of baseline health behavior adherence to medication, diet, and physical activity using the three relevant items from the Medical Outcomes Study Specific Adherence Scale [MOS SAS (DiMatteo et al., 1992)]; suboptimal adherence was defined as a total score of <15/18, and participants were not excluded from the study or stratified in analyses based on MOS SAS scores. In addition, baseline sociodemographic and medical data were obtained via interview at enrollment and

supplemented by electronic medical record review post-discharge. These baseline characteristics and adherence ratings, along with a study flowchart of approached, enrolling, and completing patients (Supplementary Figure 1), were included to provide greater descriptive information about the study cohort.

Qualitative interviews—Enrollees then participated in semi-structured, individual qualitative interviews in the hospital (T1) and three months post-discharge (T2). Audiotaped interviews lasted approximately 50-60 minutes (median duration: 56 minutes).

To ensure study and manuscript quality, we followed the published COREQ guidelines for qualitative research (Tong et al., 2007) and a related qualitative study quality assessment for cardiac health behavior research (Murray et al., 2013). We also employed multiple techniques to ensure rigor, including repeated in-depth review of the protocol by an experienced qualitative researcher (EP), pilot testing, iterative questioning, and investigator triangulation (Shenton, 2004; Denzin, 2006). We also aimed to meet criteria for transparency and systematicity per quality guidelines for qualitative research (Meyrick, 2006). The two interviewers (CM and CD) had experience administering clinical research interventions exploring positive psychological states (Huffman et al., 2014; Huffman et al., 2011) and received extensive training on qualitative interviewing by the principal investigator (JH) and the team's qualitative expert (EP).

The interview guide (Supplementary Table 1) was developed to meet the study goals of (a) exploring ACS patients' experience of positive psychological states over the three-month study period, and (b) examining the links between these states and heart-healthy diet, physical activity, adherence to cardiac medication, and other health behaviors as part of our theoretical model linking positive states, cardiac health behaviors, and cardiac outcomes (Supplementary Figure 1). The interview guide was developed using published literature on cardiac patients' experience, our theoretical model, and our prior work studying positive psychological interventions in cardiac patients (Huffman et al., 2011).

Interviews began with open-ended questions about engagement in cardiac health behaviors (preceding admission for the T1 interview and in the three months post-ACS for T2). The next interview section inquired about participants' experience of positive cognitions and emotions, with open-ended questions and specific queries about the existence of these positive states. Finally, participants were asked about connections between positive psychological states and cardiac health behaviors and the directionality of any links (i.e., whether positive states preceded health behaviors or vice versa), with probes about specific health behaviors. Three pilot interviews were conducted with eligible patients; all members of the study team reviewed transcripts and made minor adjustments to the interview guide to ensure that all research questions were fully addressed. The audiofiles were transcribed by members of the research team and reviewed for clarity and comprehension by the principal investigator. Interviews were completed until thematic saturation was reached (Guest et al., 2006).

Analysis

A coding framework was initially generated using directed content analysis (Hsieh and Shannon, 2005) (i.e., the structure of the initial coding tree was developed using an underlying conceptual model), with adjustments made using conventional content analysis (i.e., utilizing concepts derived directly from the interview text) (Hsieh and Shannon, 2005). Consistent with content analysis (Priest et al., 2002; Bryman, 2012), our analyses identified emergent themes through repeated review of codings to assess reliability of previously coded text and identify new themes. Edits to the initial coding framework were made serially by reviewing the raw data and identifying common themes, with discussions among coders and senior team members to gain consensus on themes and coding assignments. NVivo 10 (QSR International) was used for content analysis. All interviews were coded independently by two members of the research team (final intercoder reliability: kappa=0.89). Credibility and dependability of the coding process was achieved through this independent coding of interviews and comparison of coding to the raw data (Devers, 1999). Major and minor themes within each content area were identified. Counts of the number of expressions of positive affective states were obtained via direct review of transcript data. Discrepancies were resolved via examination of the transcript data and discussion between the coders, with unresolved discrepancies resolved via discussion with JH and/or EP.

Results

Participant characteristics and quantitative assessments

Overall, 36 participants enrolled (Supplementary Figure 2), with two participants withdrawing from the study prior to the interview, resulting in 34 T1 baseline interviews. There were no significant differences between enrolled participants and those (N=25) who declined or were excluded with respect to age, gender, admission diagnosis (MI vs. UA), or race/ethnicity (all $p > .10$). Two participants died prior to their three month interviews. Twenty-eight (88%) of the remaining 32 participants completed T2 interviews. Table 1 outlines the baseline characteristics of the study cohort. Twenty-six participants (77%) were considered suboptimally adherent (MOS SAS score <15) to the three queried health behaviors, with participants at T1 substantially more adherent to medications (mean score 5.5/6) than to diet (3.8/6) or physical activity (2.6/6).

Positive cognitions and emotions

Positive psychological experiences were frequently expressed in response to open-ended questions and structured probes at both timepoints, with a moderate reduction of positive psychological experiences at three months (202 expressions at T1; 107 at T2). Supplementary Figure 3 displays the relative frequencies of specific positive states expressed during the two interviews. Gratitude was the most commonly reported positive psychological experience at both T1 (N=31) and T2 (N=18), and this gratitude was expressed in a number of different domains. Gratitude toward medical providers was commonly expressed, as one participant shared: I'm thankful for the excellent, totally excellent hospital staff. I have a great deal of admiration for them; they dealt with me, and I can be difficult at times, but they were always, always without fear, super nice, and friendly to me. (ID27, T1)

Gratitude toward family and other supports was also a common theme: And I'm very grateful that my wife is at home with me. We live together, so I feel very grateful that I have family that can support me and take care of me; drive me to the hospital, drive me back, and take care of me. (ID24, T1)

Despite the relatively small number of female participants (N=12), there were differences in expressions of gratitude noted between men and women. Men more commonly expressed gratitude in relation to the future and in being able to improve one's health: ...the gratitude of being given a second chance. If I go back to [working] 80 hours a week and eating McDonalds every night, I'll just throw it all away. (ID25, T1)

In contrast, women more often expressed gratitude with regard to existing supports and blessings: I thank life for everything I have, because even though it's hard, by some people's standards I don't have much, if anything, but I do. I have a place to go home to...you can find gratitude in the smallest things if you look for them. (ID14, T1)

Optimism (expressed in N=29 at T1 and N=16 at T2) and love (expressed in N=22 [T1] and N=10 [T2]) were also commonly expressed at both T1 and T2.

Links between positive psychological constructs and cardiac health behaviors

Participants frequently reported connections between positive states and health behaviors, more commonly in the direction of cardiac health behaviors leading to the experience of positive states (Direction B in Supplementary Figure 1).

Health behaviors leading to positive psychological constructs—The connection between physical activity and subsequent positive affect/vitality (Direction B1, Supplementary Figure 1) was often voiced at both timepoints and by both adherers and nonadherers. One participant noted: After any exercise, you know, you do the exercise, you're tired, you sit down and relax, you take a shower, and after that you're feeling a lot better, a lot...happier. (ID28, T2)

Participants also often commented that engagement in physical activity and healthy eating led to pride and satisfaction: When I'm [exercising] I'm feeling...like I accomplished something...pride, yes. Lots of pride...after twelve weeks when I weigh [myself], I lost weight and I realized that I'm not doing that for nothing. The result is there. (ID10, T2)

Regarding healthy eating (Direction B2, Supplementary Figure 1), a participant reported: When you know you've done the right thing [regarding healthy eating], you stand a little taller, you walk a little straighter, and [you feel] so much bigger. (ID14, T1)

Positive psychological constructs leading to health behaviors (Direction A, Supplementary Figure 1)—Links between positive states and health behaviors also occurred in the opposite direction. The most commonly expressed connection involving positive states and subsequent participation in health behaviors was that between positive affect/happiness and physical activity (Direction A1, Supplementary Figure 1). As with the

other links, such connections appeared to be present in the hospital and three months later, and among both adherers and nonadherers.

Positive affect was related to initiation of physical activity. One participant explained: If I'm happy, I feel more relaxed and I have the energy to go and do something for my body [like] exercise. (ID36, T1)

Positive affect was also linked to continuation of activity: When I'm happy...I get my music on and sometimes I walk farther than I normally walk. (ID08, T2)

Also commonly expressed were connections between optimism (especially optimism related to one's health and prognosis) and subsequent health behaviors. This related to overall approaches to health behaviors: I always feel optimistic and so I think that enables me to try [healthy behaviors] again and again and again. Figure it out in a different way in approaching the problem...I just kind of accept [it] and try again. (ID25, T2)

Optimism also was linked to specific health behaviors, especially diet and physical activity: I think I'm reasonably optimistic and I kind of go through thinking, 'If I work hard, I really put my mind to it, I can really make things work.' So, feelings of hope, for example, in exercise and things like that...I feel, 'oh, if I exercise, if I do the right thing, if I diet, if I eat my oatmeal, well then I can conquer.' (ID24, T1) However, the connections between optimism and diet were made less frequently and these connections must be considered exploratory.

Cyclical nature of health behaviors and positive states—Some participants noted that induction of positive states from health behavior participation—especially physical activity—led to subsequent improvement in initiation and completion of health behaviors: You know, when you do it and you work through the pain of the workout and you...start feeling good it generates a positive feeling that makes you want to do more good for yourself. And...it makes you not want to eat the jelly donut because that'll just take away all that work...you begin to think a little differently. (ID18, T1)

Evolution of themes across timepoints—Overall, the major and minor themes remained consistent across the T1 and T2 interviews. There were, as noted, somewhat fewer expressions of positive emotions at T2, and there was more discussion of health behaviors at T2 in the context of participants' experience attempting to improve or maintain health behaviors in the three months post-ACS. However, themes regarding optimism/positive affect and their bidirectional connection with health behaviors, as well as the lack of such connections via gratitude/love (or links to medication adherence) were consistent across both interviews.

Infrequently noted concepts, behaviors, and constructs—Links between positive states and health behaviors did not occur in all explored domains. Though they were among the most commonly expressed positive psychological states, gratitude and love were not commonly linked to health behavior completion in either direction. Among health behaviors, while diet and (especially) physical activity were often linked to positive states, medication

adherence was rarely associated with positive psychological constructs (Directions A3 and B3, Supplementary Figure 1). We are unable to make firm conclusions about additional positive psychological states (e.g., joy) given the limited content in the transcripts regarding these less frequent conditions.

Discussion

Overall, positive psychological states were frequently described by ACS patients, and were noted to both precede and follow completion of health behaviors. The most commonly experienced positive states, and the most frequent connections to cardiac health behaviors, appeared consistent across both timepoints.

We found that a variety of discrete positive psychological states were described by participants, both spontaneously and in response to specific probes. Expressions of positive states appeared to be more common in the hospital, with a reduction of such expressions at the three month interview. Gratitude was the most frequently expressed construct, both in the hospital and at three months, with gratitude for medical care/care providers and for loved ones serving as common themes. Optimism (typically regarding future health) and love (usually for family members) were also commonly voiced at both timepoints; other positive states, such as pride, enthusiasm, and joy, were expressed infrequently.

These findings regarding the most common psychological experiences are generally consistent with the small existing literature on positive psychological states in cardiac patients. Two reports by Laerum and colleagues (Laerum et al., 1987; Laerum et al., 1988) describe the results of qualitative interviews with male post-MI patients 3 to 5 months post-MI. The authors found that a meaningful proportion of patients experienced gratitude, enjoyment of recreational activities, and love toward family. An interview study of women 3 months to 5 years after MI (Norekval et al., 2008) used a single open-ended question about positive aspects of the experience and found that roughly one-half of patients described greater appreciation/gratitude for life. Finally, a small qualitative study examining hope following MI found that hope was associated with themes of social connectedness, spirituality, and determination (Daly et al., 1999).

Regarding other, somewhat similar constructs, small qualitative studies have examined coping (N=5) and illness perceptions (N=10) in women attending cardiac rehabilitation after MI (White et al., 2007; MacInnes, 2005); these studies linked hope and a desire for greater control with the decision to attend cardiac rehabilitation, which focuses on health behaviors. Finally, the related concept of self-efficacy has been linked to greater likelihood of physical activity among patients at cardiac rehabilitation in past qualitative work (Woodgate et al., 2005).

The current project adds to this literature in ACS patients by serving as the first to examine positive psychological states in the hospital and the first to perform repeated in-depth interviews about these states during admission and upon return to normal routines three months later. It is also the first to systematically probe for multiple distinct positive psychological constructs to allow for a richer understanding of patients' experience in these

domains and to allow for comparisons of frequency among these states. Further study to examine predictors of the existence and durability of the most common psychological states —gratitude, optimism, and love—is warranted, especially if the states are subsequently linked to overall well-being or other outcomes in persons with heart disease.

To our knowledge, this study is also the first to qualitatively explore the relationships between positive states and cardiac health behaviors in patients suffering an ACS. Participants in this study most commonly noted that completion of health behaviors, especially physical activity, led to subsequent increases in positive cognitions and emotions. However, numerous participants also noted that positive states led to initiation and maintenance of physical activity as well as adherence to a heart-healthy diet. Furthermore, several patients noted a cyclical relationship such that positive states generated by health behaviors led to further completion of additional health behaviors.

Regarding specific states, both optimism and positive affect/happiness were linked in several cases to eating a healthy diet and engaging in physical activity. Prior quantitative work has linked optimism and positive affect to superior cardiac outcomes in non-cardiac patients (Rasmussen et al., 2009; DuBois et al., 2012). Even more pertinent to this work, optimism in particular has been independently associated with greater participation in physical activity in older adults (Steptoe et al., 2006; Giltay et al., 2007; Browning et al., 2009), and to healthy diet in younger adults (Kelloniemi et al., 2005) and postmenopausal women (Tinker et al., 2007). In contrast, though gratitude was the most commonly experienced positive state, participants rarely associated gratitude with health behavior completion.

Given the observed links between optimism/positive affect and cardiac health behaviors, these positive states could represent an important intervention target in the three months following ACS. This window of time for such an affect-boosting intervention may be particularly important given the potential for a major change in cardiac health behaviors in the context of a cardiac event. However, without intervention these positive states appeared to wane over this time period. There is some suggestion that positive psychology interventions might be effective in cardiac patients (Bolier et al., 2013; Huffman et al., 2011; Peterson et al., 2012), though much more work must be done to establish the nature, feasibility, and efficacy of such interventions in high-risk cardiac patients, such as those suffering an ACS.

These connections may also be understood within the framework of post-traumatic growth, the concept of positive consequences arising as a result of coping with traumatic experiences, such as serious medical illness (Sheikh, 2004; Leung et al., 2012). While our findings regarding positive emotional states and health behaviors may be related to this phenomenon, we found that that positive states and health behaviors also appeared to be connected even prior to the cardiac event, suggesting another possibility: those who have optimism/positive affect at any timepoint may be more likely to take on heart-healthy behavior, and interventions may wish to focus on cultivating these states rather than necessarily focusing on post-traumatic growth.

Of note, medication adherence was not linked with positive psychological states by participants; it may be that adherence to medications is more related to memory and conscientiousness (Stilley et al., 2004) and prompted more by concrete interventions (e.g., electronic reminders, pillboxes) than related to motivational or affective boosts from positive psychological states. Our cohort also was highly adherent to medications at baseline (mean score on medication adherence item on SAS=5.5/6), and examination in a less medication-adherent cohort may have had different findings.

Limitations of this work were inclusion of a single academic medical center site, a sole focus on positive emotional states (rather than both positive and negative emotions), and attrition of approximately 12% of the cohort at three months. We did not compare themes between those with high versus low adherence at baseline given that a substantial majority of participants (more than three-quarters) had suboptimal baseline adherence, limiting us from using mixed methods analysis in this report of our data. With regard to reflexivity (Meyrick, 2006), our aims (and interview guide) were focused on positive states and health behaviors, and this may well have increased the likelihood of our finding associations between these two domains. We did not have participants complete broader measures of function to contextualize the cognitions and emotions experienced after an ACS. Finally, though the sample size of 34 participants and 62 total interviews may be viewed as small, we completed interviews until thematic saturation, and much smaller samples and interview totals have been found to be adequate for thematic saturation in prior studies (Guest et al., 2006; Searle et al., 2013).

Given that this is the first qualitative study of these concepts in cardiac patients, future studies should further examine these connections in larger and more diagnostically diverse cardiac cohorts. Such studies may also consider simultaneous examination of negative and positive psychological states, along with more comprehensive use of mixed methods involving serial assessments of positive states (e.g., ecological momentary assessment), and objective measures of health behaviors.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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References

Bolier L, Haverman M, Westerhof GJ, et al. Positive psychology interventions: a meta-analysis of randomized controlled studies. BMC Public Health. 2013; 13:119. [PubMed: 23390882]

Browning C, Sims J, Kendig H, et al. Predictors of physical activity behavior in older community-dwelling adults. Journal of Allied Health. 2009; 38(1):8–17. [PubMed: 19361018]

Bryman, A. Social Research Methods. 4th ed. Oxford University Press; 2012.

Callahan CM, Unverzagt FW, Hui SL, et al. Six-item screener to identify cognitive impairment among potential subjects for clinical research. Medical Care. 2002; 40(9):771–781. [PubMed: 12218768]

Chida Y, Steptoe A. Positive psychological well-being and mortality: a quantitative review of prospective observational studies. Psychosomatic Medicine. 2008; 70(7):741–756. [PubMed: 18725425]

Chocron S, Etievent JP, Viel JF, et al. Preoperative quality of life as a predictive factor of 3-year survival after open heart operations. The Annals of Thoracic Surgery. 2000; 69(3):722–727. [PubMed: 10750750]

Chow CK, Jolly S, Rao-Melacini P, et al. Association of diet, exercise, and smoking modification with risk of early cardiovascular events after acute coronary syndromes. Circulation. 2010; 121(6):750–758. [PubMed: 20124123]

Daly J, Jackson D, Davidson PM. The experience of hope for survivors of acute myocardial infarction (AMI): a qualitative research study. Australian Journal of Advanced Nursing. 1999; 16(3):38–44. [PubMed: 10425994]

De Jong MJ, Chung ML, Wu JR, et al. Linkages between anxiety and outcomes in heart failure. Heart & Lung: The Journal of Acute and Critical Care. 2011; 40(5):393–404. [PubMed: 21453974]

Denzin, NK. Sociological Methods: A Sourcebook. 5th ed. Aldine Transaction; Chicago, IL: 2006.

Devers KJ. How will we know “good” qualitative research when we see it? Beginning the dialogue in health services research. Health Services Research Journal. 1999; 34(5 Pt 2):1153–1188.

DiMatteo MR, Hays RD, Sherbourne CD. Adherence to cancer regimens: implications for treating the older patient. Oncology. 1992; 6(2 Suppl):50–57. [PubMed: 1532737]

DuBois CM, Beach SR, Kashdan TB, et al. Positive psychological attributes and cardiac outcomes: associations, mechanisms, and interventions. Psychosomatics. 2012; 53(4):303–318. [PubMed: 22748749]

European Heart Journal. Myocardial infarction redefined--a consensus document of The Joint European Society of Cardiology/American College of Cardiology Committee for the redefinition of myocardial infarction. European Heart Journal. 2000; 21(18):1502–1513. [PubMed: 10973764]

Gehi AK, Ali S, Na B, et al. Self-reported medication adherence and cardiovascular events in patients with stable coronary heart disease: the heart and soul study. Archives of Internal Medicine. 2007; 167(16):1798–1803. [PubMed: 17846400]

Giltay EJ, Geleijnse JM, Zitman FG, et al. Lifestyle and dietary correlates of dispositional optimism in men: The Zutphen Elderly Study. Journal of Psychosomatic Research. 2007; 63(5):483–490. [PubMed: 17980220]

Grech ED, Ramsdale DR. Acute coronary syndrome: unstable angina and non-ST segment elevation myocardial infarction. British Medical Journal. 2003; 326(7401):1259–1261. [PubMed: 12791748]

Guest G, Bunce A, Johnson L. How many interviews are rnough?: An experiment with data saturation and variability. Field Methods. 2006; 18(1):59–82.

Hsieh HF, Shannon SE. Three approaches to qualitative content analysis. Qualitative Health Research. 2005; 15(9):1277–1288. [PubMed: 16204405]

Huffman JC, Beach SR, Suarez L, et al. Design and baseline data from the Management of Sadness and Anxiety in Cardiology (MOSAIC) randomized controlled trial. Contemporary Clinical Trials. 2013; 36(2):488–501. [PubMed: 24090821]

Huffman JC, DuBois CM, Healy BC, et al. Feasibility and utility of positive psychology exercises for suicidal inpatients. General Hospital Psychiatry. 2014; 36(1):88–94. [PubMed: 24230461]

Huffman JC, Mastromauro CA, Boehm JK, et al. Development of a positive psychology intervention for patients with acute cardiovascular disease. Heart International. 2011; 6(2):e14. [PubMed: 23825741]

Kelloniemi H, Ek E, Laitinen J. Optimism, dietary habits, body mass index and smoking among young Finnish adults. Appetite. 2005; 45(2):169–176. [PubMed: 16009454]

Kolansky DM. Acute coronary syndromes: morbidity, mortality, and pharmacoeconomic burden. American Journal of Managed Care. 2009; 15(2 Suppl):S36–41. [PubMed: 19355807]

Konstam V, Salem D, Pouleur H, et al. Baseline quality of life as a predictor of mortality and hospitalization in 5,025 patients with congestive heart failure. SOLVD Investigations. Studies of

Left Ventricular Dysfunction Investigators. American Journal of Cardiology. 1996; 78(8):890–895. [PubMed: 8888661]

Laerum E, Johnsen N, Smith P, et al. Can myocardial infarction induce positive changes in family relationships? Family Practice. 1987; 4(4):302–305. [PubMed: 3692038]

Laerum E, Johnsen N, Smith P, et al. Myocardial infarction may induce positive changes in life-style and in the quality of life. Scandinavian Journal of Primary Health Care. 1988; 6(2):67–71. [PubMed: 3387709]

Leedham B, Meyerowitz BE, Muirhead J, et al. Positive expectations predict health after heart transplantation. Health Psychology. 1995; 14(1):74–79. [PubMed: 7737077]

Leung YW, Alter DA, Prior PL, et al. Posttraumatic growth in coronary artery disease outpatients: Relationship to degree of trauma and health service use. Journal of Psychosomatic Research. 2012; 72(4):293–299. [PubMed: 22405224]

Lyubomirsky S, King L, Diener E. The benefits of frequent positive affect: does happiness lead to success? Psychological Bulletin. 2005; 131(6):803–855. [PubMed: 16351326]

MacInnes JD. The illness perceptions of women following acute myocardial infarction: implications for behaviour change and attendance at cardiac rehabilitation. Women & Health. 2005; 42(4):105–121. [PubMed: 16782678]

Menzin J, Wygant G, Hauch O, et al. One-year costs of ischemic heart disease among patients with acute coronary syndromes: findings from a multi-employer claims database. Current Medical Research and Opinion. 2008; 24(2):461–468. [PubMed: 18194592]

Meyrick J. What is good qualitative research? A first step towards a comprehensive approach to judging rigour/quality. Journal of Health Psychology. 2006; 11(5):799–808. [PubMed: 16908474]

Murray J, Fenton G, Honey S, et al. A qualitative synthesis of factors influencing maintenance of lifestyle behaviour change in individuals with high cardiovascular risk. BMC Cardiovascular Disorders. 2013; 13:48. [PubMed: 23829636]

Norekval TM, Moons P, Hanestad BR, et al. The other side of the coin: perceived positive effects of illness in women following acute myocardial infarction. European Journal of Cardiovascular Nursing. 2008; 7(1):80–87. [PubMed: 17977796]

Peterson JC, Charlson ME, Hoffman Z, et al. A randomized controlled trial of positive-affect induction to promote physical activity after percutaneous coronary intervention. Archives of Internal Medicine. 2012; 172(4):329–336. [PubMed: 22269589]

Priest H, Roberts P, Woods L. An overview of three different approaches to the interpretation of qualitative data. Part 1: Theoretical issues. Nursing Research. 2002; 10(1):30–42.

Rasmussen HN, Scheier MF, Greenhouse JB. Optimism and physical health: a meta-analytic review. Annals of Behavioral Medicine. 2009; 37:239–256. [PubMed: 19711142]

Roest AM, Martens EJ, Denollet J, et al. Prognostic association of anxiety post myocardial infarction with mortality and new cardiac events: a meta-analysis. Psychosomatic Medicine. 2010; 72(6): 563–569. [PubMed: 20410247]

Roger VL, Go AS, Lloyd-Jones DM, et al. Heart disease and stroke statistics--2011 update: a report from the American Heart Association. Circulation. 2011; 123(4):e18–e209. [PubMed: 21160056]

Rogerson MC, Murphy BM, Bird S, et al. “I don't have the heart”: a qualitative study of barriers to and facilitators of physical activity for people with coronary heart disease and depressive symptoms. International Journal of Behavioral Nutrition and Physical Activity. 2012; 9:140. [PubMed: 23194091]

Schnohr P, Kristensen TS, Prescott E, et al. Stress and life dissatisfaction are inversely associated with jogging and other types of physical activity in leisure time--The Copenhagen City Heart Study. Scandinavian Journal of Medicine & Science in Sports. 2005; 15(2):107–112. [PubMed: 15773865]

Searle A, Haase AM, Chalder M, et al. Participants’ experiences of facilitated physical activity for the management of depression in primary care. Journal of Health Psychology. 2013:e149–e156. Epub ahead of print 2013 Sep 10. DOI: 10.1177/1359105313493648.

Sheikh AI. Posttraumatic growth in the context of heart disease. Journal of Clinical Psychology in Medical Settings. 2004; 11(4):265–273.

Shenton AK. Strategies for ensuring trustworthiness in qualitative research projects. Education for Information. 2004; 22(2):63–75.

Steca P, Greco A, Monzani D, et al. How does illness severity influence depression, health satisfaction and life satisfaction in patients with cardiovascular disease? The mediating role of illness perception and self-efficacy beliefs. Psychology & Health. 2013; 28(7):765–783. [PubMed: 23343116]

Steptoe A, Dockray S, Wardle J. Positive affect and psychobiological processes relevant to health. Journal of Personality. 2009; 77(6):1747–1776. [PubMed: 19796062]

Steptoe A, Wright C, Kunz-Ebrecht SR, et al. Dispositional optimism and health behaviour in community-dwelling older people: associations with healthy ageing. British Journal of Health Psychology. 2006; 11(Pt 1):71–84. [PubMed: 16480556]

Stilley CS, Sereika S, Muldoon MF, et al. Psychological and cognitive function: predictors of adherence with cholesterol lowering treatment. Annals of Behavioral Medicine. 2004; 27(2):117–124. [PubMed: 15026295]

Sud A, Kline-Rogers EM, Eagle KA, et al. Adherence to medications by patients after acute coronary syndromes. Annals of Pharmacotherapy. 2005; 39(11):1792–1797. [PubMed: 16204391]

Theroux P, Fuster V. Acute coronary syndromes: unstable angina and non-Q-wave myocardial infarction. Circulation. 1998; 97(12):1195–1206. [PubMed: 9537346]

Tinker LF, Rosal MC, Young AF, et al. Predictors of dietary change and maintenance in the Women's Health Initiative Dietary Modification Trial. Journal of the American Dietetic Association. 2007; 107(7):1155–1166. [PubMed: 17604744]

Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. International Journal for Quality in Health Care. 2007; 19(6):349–357. [PubMed: 17872937]

White J, Hunter M, Holttum S. How do women experience myocardial infarction? A qualitative exploration of illness perceptions, adjustment and coping. Psychology, Health & Medicine. 2007; 12(3):278–288.

Woodgate J, Brawley LR, Weston ZJ. Maintenance Cardiac Rehabilitation Exercise Adherence: Effects of Task and Self-Regulatory Self-Efficacy. Journal of Applied Social Psychology. 2005; 35(1): 183–222.

Ziegelstein RC, Fauerbach JA, Stevens SS, et al. Patients with depression are less likely to follow recommendations to reduce cardiac risk during recovery from a myocardial infarction. Archives of Internal Medicine. 2000; 160(12):1818–1823. [PubMed: 10871976]

Table 1

Baseline characteristics and self-reported adherence (N=34)

Characteristic	N (%)*
Sociodemographics	
Age in years (mean [SD])	63.4 (11.9)
Male	22 (64.7)
Married	23 (67.7)
Racial or ethnic minority	12 (35.3)
Latino/a	7 (20.6)
Black	3 (5.9)
Asian	2 (8.8)
Living alone	7 (20.6)
Sub-optimal adherence (MOS SAS < 15)	26 (76.5)
Admission diagnosis	
Myocardial Infarction	13 (38.2)
Unstable Angina	21 (61.8)
Baseline health behavior adherence	
MOS SAS (mean [SD])	
Exercise [score, out of 6]	2.6 (1.8)
Diet [score, out of 6]	3.8 (1.7)
Medication [score, out of 6]	5.5 (1.1)
Total [score, out of 18]	11.9 (3.5)

Note. MOS SAS=Medical Outcomes Study Specific Adherence Scale; SD=Standard Deviation.

*Unless otherwise noted.