BRIEF REPORT

Irrational Health Beliefs Predict Adherence to Cardiac Rehabilitation: A Pilot Study

Derek R. Anderson and Charles F. Emery
The Ohio State University

Objective: Cardiac rehabilitation (CR) is routinely prescribed for patients with cardiovascular disease (CVD), but data indicate that 20% to 50% of patients do not adhere to CR. Studies have focused on the impact of depression on CR adherence, but results have been equivocal. Irrational health beliefs are related to adherence among diabetes patients, but have not been examined among cardiac patients. This study examined depression and irrational health beliefs as predictors of CR adherence. Method: Sixty-one participants (30% female; mean age = 59.9 ± 11.8; 72% Caucasian), recruited at the outset of an outpatient CR program, completed a baseline questionnaire including measures of depression and irrational health beliefs. CR adherence was defined as the percentage of CR exercise sessions completed. Pearson correlations and analysis of variance determined demographic factors related to adherence. Hierarchical regression analyses examined irrational health beliefs and depression as predictors of CR adherence. Results: Older age (p < .05) and higher income (p < .05) were associated with better CR adherence, but CR adherence was lower among African Americans than Caucasians (p < .01). Depression was not related to adherence (p = .78), but irrational health beliefs predicted CR adherence, after controlling for race/ethnicity, income, and age (β = −.290, ΔR² = .074, ΔF[1,55] = 5.50, p < .05). Conclusions: Irrational health beliefs predicted CR adherence but depression did not. Thus, poorer adherence to CR was associated with endorsing beliefs that are not based in medical evidence.

Keywords: irrational health beliefs, adherence, cardiac rehabilitation, depression

Cardiovascular disease (CVD) is the leading cause of death in the United States. Prior studies have found that patients with CVD who participate in cardiac rehabilitation (CR) programs have lower mortality rates as well as reduced total cholesterol, triglycerides, systolic blood pressure, and self-reported rates of smoking (Taylor et al., 2004). CR programs also have been found to reduce psychological symptoms associated with coronary artery disease, including depression and hostility (Lavie & Milani, 2005).

Despite the numerous benefits of CR, it is estimated that 20% to 50% of patients do not adhere to CR programs or discontinue prematurely (Cooper, Lloyd, Weinman, & Jackson, 1999). Several studies have found an association between depression and poor CR adherence (Glazer, Emery, Frid, & Banyasz, 2002; Kronish et al., 2006), but others have found no association (Moore, Dolansky, Ruland, Pashkow, & Blackburn, 2003; O’Brien, Thow, & Raftery, 2009).

Cognitive variables also may influence adherence and health status among medical patients. Studies confirm that cognitive distortions (e.g., overgeneralization) are related to both depression and disability among medical patients (Smith, Peck, Milano, & Ward, 1988), and that health-related cognitive distortions (e.g., catastrophizing about disease-related symptoms) are stronger predictors of health behavior than are general cognitive distortions (Smith et al., 1988). In a study of 42 patients in CR, Christensen, Edwards, et al. (1999) found that both general and cardiac-specific cognitive distortions predicted poorer self-reported social functioning and mobility following CR, but adherence to CR was not assessed. The Irrational Health Belief Scale (IHBS; Christensen, Moran, & Weibe, 1999) was developed to measure health-related cognitive distortions that are not disease specific. IHBS items reflect beliefs based on nonmedical factors such as personal health experience (e.g., “If it didn’t work the first time, it probably never will in my case”), catastrophizing (e.g., “If I have to take this medication, my life will never be the same”), and illogical inferences about treatment side effects (e.g., “Something that makes me feel this tired can’t be any good for me”). Patients endorsing greater irrational health beliefs may be more likely to make health-related decisions that are not based on medical evidence and that, in turn, undermine health-related adherence. Among patients with diabetes, higher IHBS scores are associated with poorer health practices and negative affect, and are predictive of lower adherence, both self-report and biologically derived (hemoglobin alpha1), after controlling for personality factors and comorbidity (Christensen, Moran, et al., 1999).
Several studies have shown that psychological distress (e.g., depression, anxiety) is associated with poor adherence in CR patients, but prior studies have largely neglected the impact of health-related cognitive distortions on adherence in CR. Although irrational health beliefs have not been extensively explored in the past 15 years, the evidence linking irrational health beliefs to general medical adherence is compelling and underscores the relevance of further examination in CR patients. This pilot study is the first prospective evaluation of the influence of irrational health beliefs on CR adherence. It was hypothesized that irrational health beliefs and endorsement of greater depressive symptoms would both predict poorer adherence to CR.

Method

Participants

A convenience sample of 61 patients (29.5% women) was recruited from the outpatient CR program at The Ohio State University Medical Center. The mean age of participants was 59.9 years (SD = 11.8; range = 31 to 84 years), and most of the sample was Caucasian (72%) or African American (23%). Participants had various cardiac diagnoses, including recent coronary artery bypass graft surgery (19%), percutaneous transluminal coronary angioplasty (41%), history of myocardial infarction (20%), or coronary heart disease (20%). Criteria for participation included the ability to speak and read English, and diagnosis of a cardiac condition that led to the CR referral.

Procedures

Participants were recruited and consented at the time of their initial orientation to the CR program. The Ohio State University CR program typically lasts 12 weeks and involves telemetry-monitored exercise training (3 times per week for approximately 1 hr) as well as education classes (1 hr per week) covering topics such as nutrition, stress management, and smoking cessation. Study participants were given self-report questionnaires to complete prior to beginning the first CR exercise session. The questionnaire packet required approximately 15 to 20 min for completion.

Measures

In addition to patient demographics, the questionnaire packet included several measures of depression and irrational health beliefs.

The Center for Epidemiologic Studies Depression Scale (CES-D) is a 20-item self-report measure of depressive symptomology among the general population (Radloff, 1977), with high internal consistency and adequate test-retest reliability. Participants rate how often, in the past week, they have experienced a specific symptom on a scale from 0 (rarely or none of the time) to 3 (more or all of the time). CES-D reliability was high in this sample (Cronbach’s alpha = .90).

The Irrational Health Belief Scale (IHBS; Christensen, Moran, et al., 1999) is a validated 20-item questionnaire with demonstrated relevance to adherence in chronically ill adults (e.g., diabetes). Each item on the IHBS is a brief vignette describing a health-related experience in which patients exhibit distorted or illogical inferences regarding health. For example, the following is a typical vignette:

During a routine check-up, your doctor emphasized the importance of exercise and eating right to prevent health problems. You notice that the doctor is quite overweight. You think to yourself, “If good eating habits and exercise were really important, he would lose weight himself.”

The participant is asked to rate each vignette on a 5-point scale from 1 (not at all like I would think) to 5 (almost exactly like I would think). IHBS reliability was adequate for this sample (Cronbach’s alpha = .85).

Treatment adherence was operationalized as the percentage of exercise sessions completed out of the total number allowed by the patient’s insurance provider.

Data Analysis

Data were analyzed with Pearson correlations and ANOVA to determine demographic covariates related to adherence. Two hierarchical regression analyses were conducted evaluating depressive symptoms and irrational health beliefs as predictors of adherence. Demographic variables associated with adherence were entered in the first step, and depression or IHBS scores were entered in the second step of the regression analyses.

Results

Seventy-seven patients were approached to participate in the study. Two patients refused to participate due to privacy concerns, and 14 participants consented but did not complete the baseline questionnaires. No differences were found in age, gender, race/ethnicity, or diagnosis between study participants (N = 61) and those who elected not to participate (N = 16). Among the 61 study participants, the average proportion of CR sessions completed (as approved by their respective insurance providers) was 74.4%. Exercise sessions allowed by insurance providers ranged from 20 to 36 sessions, with 90.2% (N = 55) allowed 36 sessions, 4.9% (N = 3) allowed 24 sessions, and the remaining three subjects being allowed 27 sessions, 25 sessions, and 20 sessions, respectively. Percent of exercise sessions completed was associated with older age (r = .31, p < .05) and higher income (r = .32, p < .05). In addition, the percent of sessions completed was lower among African Americans (M = 48.0, SD = 42.3) than Caucasians (M = 81.1, SD = 32.2; p < .01). Gender, educational attainment, marital status, and employment status were not related to adherence. Because age, race/ethnicity, and income were significantly associated with percentage of CR sessions completed, they were included as covariates in the hierarchical regression models.

Although the mean CES-D score for the sample (M = 11.5, SD = 10.1) was within normal limits, 16 (27%) participants reported depressive symptoms above the standard cutoff score of 16 (Radloff, 1977). Women reported significantly greater depressive symptoms than men (p < .05). Depression was not related to other demographic variables. Adherence did not differ among those reporting higher (≥16) versus lower (<16) depressive symptoms, and depression was not related to the percentage of sessions completed (r = .04, p = .78). CES-D subscales also were exam-
ined to determine whether specific depression components were related to adherence. No CES-D subscales (i.e., Somatic, Emotional Well-Being, Depressive Affect, Interpersonal) were related to percentage of CR sessions completed.

The average IHBS score among participants was 30.7 (SD = 8.7). This score is significantly lower than observed in healthy college students (N = 392; M = 35.6, SD = 9.6; p < .01), but closer to IHBS scores among diabetes patients (N = 107; M = 33.2, SD = 12.2), as reported by Christensen, Moran, et al. (1999). Race/ethnicity was the only demographic variable associated with IHBS scores. African American patients scored higher on the irrational health beliefs questionnaire (M = 37.3) than did Caucasian patients (M = 29.0; p < .01), and this remained statistically significant after controlling for education and income (ΔR² = .08; p < .05), but was somewhat reduced when age was included as a covariate with income and education (ΔR² = .06; p = .07).

As shown in Table 1, hierarchical regression analysis revealed that irrational health beliefs predicted percentage of CR sessions completed after controlling for age, race/ethnicity, and income (β = −.290, ΔR² = .074, ΔF[1,55] = 5.50, p < .05).

Discussion

The results of this study suggest that discontinuing CR prematurely (i.e., poorer adherence) may be associated with a tendency to rely on beliefs not grounded in medical science (i.e., irrational health beliefs). Although the proportion of patients reporting clinically relevant symptoms of depression (27%) was similar to that observed in prior studies of cardiac patients (e.g., Brummett et al., 1998), depressive symptoms were not associated with adherence behavior. Thus, the data provide evidence that depression and irrational health beliefs may have distinct implications for CR adherence.

CR nonadherence is influenced by a wide range of factors, ranging from practical factors (e.g., travel time; Parks, Allison, Doughty, Cunningham, & Ellis, 2000) to cognitive factors. In the cognitive domain, French, Cooper, and Weinman (2006) found that several components of illness perceptions (i.e., positive symptom identity, more disease control, more disease-related consequences) predicted greater CR adherence. The present data extend these findings in the cognitive domain by focusing specifically on irrational (i.e., nonmedically based) cognitions. Although there is overlap between illness perceptions and irrational health beliefs, illness perceptions do not necessarily represent distortions (e.g., “There is a lot that I can do to control my symptoms”), whereas irrational health beliefs are, by definition, distorted beliefs about health. This study did not measure illness perceptions, but examining both constructs in a single study would provide further clarification of the relative influence of illness perceptions and irrational health beliefs for adherence in CR.

Irrational health beliefs were related to race/ethnicity, income, and age, but not education level. Interestingly, African American participants did not report higher levels of depression than Caucasians, but reported higher levels of irrational health beliefs, and the relationship between race/ethnicity and irrational health beliefs remained after controlling for both income and education. Although relevant demographic covariates (e.g., education) were controlled in the analysis, the large racial/ethnic differences in irrational health beliefs could also be influenced by cultural factors. Thus, further exploration of medical beliefs and attitudes are warranted to better understand the relationship of race/ethnicity to irrational health beliefs, especially because our sample was more diverse (23% African American) than past research examining irrational health beliefs (Christensen, Moran, et al., 1999). In addition, because the term irrational has negative connotations that may be misconstrued as meaning uneducated or, possibly, crazy, it is important to note that irrational health beliefs were not related to education in this sample and that irrational health beliefs can be best described as “beliefs not based on medical evidence.”

Most past studies of adherence have dichotomized participants into completers and noncompleters, but this method reduces statistical power and clusters subjects with possibly quite varied adherence behavior into a single category. Thus, the percentage of sessions completed was identified as the optimal indicator of adherence. Baseline physical parameters (i.e., maximal oxygen consumption, body mass index, cardiac diagnosis) were not associated with adherence and were therefore not included as covariates. Although the results indicate influences of irrational health beliefs on short-term health behavior (CR adherence), there were no longer-term follow-up data available in this study. The sample size (N = 61) and prospective study design suggest that there may have been insufficient power to detect medium effect sizes, thus increasing risk of Type II error regarding depression. However, these data are consistent with several other larger studies revealing no association between depression and CR adherence (Moore et al., 2003; O’Brien et al., 2009).

Identifying and targeting predictors of CR adherence may provide an opportunity for intervening among individuals at greater risk of nonadherence. These results suggest that targeting patients with higher levels of irrational health beliefs may be a strategy for improving adherence to CR. Past studies utilizing cognitive–behavioral therapy techniques among medical patients have achieved reduced depression by addressing cognitive distortions as a whole (Rizzo, Creed, Goldberg, Meader, & Pilling, 2011). This study suggests that targeting health-specific distortions as found in the IHBS (e.g., “These past two months have been a complete waste”) may be relevant for enhancing adherence. In addition to cognitive restructuring, it also may be important to consider cardiac-relevant education in this context. Although number of years of education was not related to irrational health beliefs or...
adherence in this sample, cardiac-specific education (which was not assessed in this study) may have a substantial influence on irrational health beliefs and adherence. These pilot data support the relevance of further examining irrational health beliefs in the context of other health behaviors, such as diet, smoking, and alcohol use, among patients with cardiac disease as well as in the context of other chronic health problems.

References


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