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Health care utilization in patients with non-cardiac chest pain: A longitudinal analysis of chest pain, anxiety, and interoceptive fear

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Abstract

Chest pain can be a frightening experience that leads many to seek medical evaluation (American Heart Association, 2009). The symptom results in costly health care utilization (Kahn, 2000). Over half of patients referred for cardiac evaluations of chest pain do not obtain definitive medical explanations for their symptoms; these cases are described as non-cardiac chest pain (NCCP: Bass & Mayou, 1995). Some patients with NCCP are not reassured after being informed their chest pain is non-cardiac in origin and seek repeated medical evaluation (Tew et al., 1995). Co-morbid anxiety and mood disorders often co-exist with NCCP and are associated with health care utilization (White et al., 2008). The current study examined chest pain, general anxiety, interoceptive fear, and health care utilization in a sample of 196 chest pain patients near the time of cardiac evaluation (Time 1), and 70 of these patients one year later (Time 2). Results indicate that anxiety and interoceptive fear were significantly associated with health care utilization at Time 1, and only interoceptive fear (at Time 1) predicted health care utilization at Time 2. This study develops research in this area by examining the relation of anxiety and health care utilization longitudinally in patients with NCCP.

Keywords

Non-cardiac chest pain; health care utilization; interoceptive fear; anxiety

Non-cardiac chest pain is prevalent and is associated with significant health care utilization. Approximately 6 million Americans seek emergency medical care for chest pain each year (American Heart Association, 2009). Over half of patients with chest pain who are admitted for cardiac evaluation do not receive a medical explanation for their pain (Bass & Mayou, 1995; Braunwald et al., 1994). Many of these patients suffer from non-cardiac chest pain (NCCP): Chest pain in the absence of identified cardiac pathology (Fleet & Beitman, 1997). NCCP is a prevalent problem, occurring in up to one of three community adults (23–33%; Eslick, Talley, Young, & Jones, 1999; Lampe et al., 1998; Mitchell, Hazuda, Haffner, Patterson, & Stern, 1991).

A sizeable group of patients with NCCP are not sufficiently reassured by their non-cardiac diagnosis and as a result, seek further medical evaluation (Potts & Bass, 1993; Tew et al., 1995; White, Brooks, & Gervino, 2012). After approximately eight months, over 50% of patients with NCCP who initially presented with chest pain continued to believe their pain

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was of cardiac origin (Dumville, MacPherson, Griffith, Miles, & Lewin, 2006), and after 16 months, over one third (44%) of patients with NCCP continued to believe that their pain was due to cardiac disease (Ockene et al., 1980). Despite being informed that their pain was not of cardiac origin, patients with NCCP presenting in urgent care settings endorsed similar levels of anxiety as patients with cardiac chest pain (Webster, Norman, Goodacre, & Thompson, 2012). Anxiety subsequent to cardiac health concerns can be persistent for patients with NCCP, remaining significantly higher than community norms at two months following negative cardiac evaluation (Robertson, Javed, Samani, & Khunti, 2008).

Perhaps in effort to seek medical reassurance or treatment for their chest pain, patients with NCCP frequently use health care in tertiary and urgent care settings. Patients with NCCP report more frequent medical visits than patients being treated for known cardiac disease (Tew et al., 1995). It is plausible that patients with NCCP are less satisfied with the explanation that their pain is not caused by a diagnosed organic cardiac syndrome, partly because they are not provided with an alternative explanation for their symptoms. That is, following negative cardiac evaluations, NCCP patients may continue to believe they have an undiagnosed serious medical problem that caused their pain. Among patients with NCCP presenting to an emergency department ($N = 126$), 77% of the sample had already seen a doctor about chest pain in the previous 12 months. Of this sample, 33% had multiple (3–5) chest pain related physician appointments (Eslick & Talley, 2004). These findings suggest that some patients with NCCP may present to multiple medical settings. Notably, however, the type of setting type (e.g., tertiary, versus urgent care settings) may relate to patient outcomes.

Frequent health care utilization results in expensive direct costs to the medical system and likely indirect costs as well. It is estimated to cost \$8 billion dollars for initial care of those who are referred for cardiac evaluations and not ultimately diagnosed with coronary artery disease (CAD) in the United States (Kahn, 2000). Further, NCCP accounts for approximately 2–5% of all emergency presentations in Australia (Eslick & Talley, 2000). Indirect costs (e.g., missed workdays, the value of lost unpaid work) have not been directly assessed in patients with NCCP; however, these are estimated to be substantial (Eslick, Coulshed, & Talley, 2002).

Anxiety and Health Care Utilization

Theories of NCCP point to a central role of affective factors, particularly anxiety, in this syndrome (Eifert, Zvolensky, & Lejuez, 2000; Mayou, 1998; White & Raffa, 2004; White & Rosenbaum, 2011). Psychological factors are central to health care seeking generally (Taylor, 2011), and anxiety may particularly contribute to health care utilization among patients with NCCP. Symptom-related anxiety is the most commonly cited reason for repeat medical visits among patients with NCCP, followed by pain severity, and anxiety because of possible serious disease (Eslick & Talley, 2004).

Cognitive and physiological aspects of anxiety may be important contributory factors to health care utilization in patients with NCCP. Anxiety disorder diagnoses are prevalent in this population (Bass & Wade, 1984; Bass, Wade, Hand, & Jackson, 1983; Eifert, Hodson, Tracey, Seville, & Gunawardane, 1996; White et al., 2008). For example, prior analyses with the sample used in the current study indicate that over one-third (41%) of patients with NCCP have co-occurring anxiety disorders and 13% have mood disorders (White et al., 2008). Anxiety disorders have been shown to increase the likelihood that patients with NCCP will seek additional health care (White et al., 2008). The physical symptoms of chest pain are closely tied to the experience of interoceptive vigilance and subsequent catastrophic interpretations of symptoms. Interoceptive fear, or fear of anxiety-related physical

sensations, may play an important role in healthcare seeking. Patients with NCCP tend to be differentially vigilant to, and fearful of, cardiopulmonary sensations (Aikens, Zvolensky, & Eifert, 2001; White, Craft, & Gervino, 2010). Further, cardiopulmonary fear is associated with cardiac distress symptoms (Aikens et al., 2001).

Evidence-based theories have implicated an important etiological and maintenance role for misinterpretations of chest pain (e.g., heart disease) and limited reassurance from prior medical evaluations for patients with NCCP. Moreover, those patients with NCCP who experience elevated interoceptive fear may seek health care services more persistently compared to those who are less vigilant or interoceptively fearful. This anxious attention to chest pain may be specific as opposed to overall anxiety. Some patients with NCCP may be generally anxious, but may be less likely to interpret interoceptive sensations as harmful. Variability in the specificity of anxiety and appraisals of interoceptive sensations could be related to differential healthcare seeking behavior. Consistent with theoretical models, interoceptive fear has been highlighted as a maintaining factor in NCCP (Mayou, 1998; White & Raffa, 2004). In the current study, we explore this theory to examine the relation between interoceptive fear and health care seeking behavior over time.

In this study, we examined chest pain, general anxiety, interoceptive fear, and health care utilization longitudinally. The current study sought to clarify the specific aspects of anxiety that lead to persistent health care utilization in patients with NCCP over time. The aim of the study was to identify whether chest pain, general anxiety, and interoceptive fear at baseline were associated with health care utilization at Time 1 and predictive of health care utilization at Time 2. We hypothesized that Time 1 chest pain, general anxiety, and interoceptive fear would be associated with health care utilization at Time 1 and Time 2. Unlike previous research (e.g., Eslick & Talley, 2004; White et al., 2008), this study examined these relations over time.

Method

Participants

Time 1—One hundred ninety six patients seeking cardiac evaluation at an urban academic medical center participated in a questionnaire-based longitudinal study on the clinical course of NCCP. Inclusion criteria required participants to be: 1) At least 18 years of age, 2) Fluent in English, 3) Presenting with a primary complaint of chest discomfort, and 4) Free from uncontrolled medical or psychiatric illness for at least six months prior to recruitment. Only those patients with a current negative cardiac evaluation, as indicated by a negative cardiac physical exam and negative stress test (i.e., exercise tolerance test), and free of cardiac disease history were asked to participate in the study.

Average patient age was 50 years ($SD=11$ years; range: 27–78 years) with relatively equal distribution by gender (43% male, 57% female). Patients most commonly self-identified as Caucasian (85%), with the remaining patients identifying themselves as African American (11%), Hispanic (2%), or another race (2%). On average, the sample was well educated (89% with education beyond 12th grade); the majority was engaged in either full (58%) or part-time (15%) employment at initial assessment (Time 1).

One-year follow-up (Time 2)—Seventy participants participated in the one-year follow-up. The patients who participated at one year follow-up were evenly distributed across sex (53% female) with a mean age of 53 years ($SD = 12$; range: 28 – 79 years). At Time 2, the majority of patients self-identified as Caucasian (85%), with the remaining patients identifying themselves as African American (10%), or Hispanic (5%). Over half were employed full-time (60%) with fifteen percent reporting part-time employment. See Table 1

for frequencies of work status, education, and ethnicity for participants at Time 1 and Time 2.

Procedure

Participants were recruited from a cardiology department of a large, urban, university-affiliated hospital. Subsequent to cardiac evaluation, including an exercise tolerance test, and after receiving negative cardiac results, eligible patients were contacted to ensure they met all additional study inclusion criteria. The longitudinal study was described in detail, including participation in the self-report questionnaire. Written informed consent was obtained and participants were compensated \$25 per time point.

Measures

Demographic and medical history—Demographic information, chest pain characteristics, medical history, and family medical history were collected using a self-report questionnaire. Questions regarding chest pain characteristics assessed duration of chest pain, episode length, average pain intensity on a 0–10 numeric scale, and frequency of chest pain.

Chest Pain—Chest pain was also assessed using the Multidimensional Pain Inventory (MPI; Kerns, Turk, & Rudy, 1985). This is one of the most widely used pain measures and it has demonstrated reliability and validity (Thompson, 1990). Specifically, this study used the pain severity sub-scale. The Cronbach's alpha was lower than expected (.66). To ensure this measure was an internally consistent measure of chest pain, items from the chest pain history questionnaire (items assessing frequency, intensity, duration, and quality of chest pain rated on a Likert-type scale) and the MPI were used to compute a Pain Severity subscale. This measure demonstrated acceptable psychometrics (Cronbach's alpha = .73). This adapted measure of chest pain has been used in our previous work (White, McDonnell, & Gervino, 2011).

Interoceptive fear—Fear of interoceptive sensations was assessed using the interoceptive subscale of the Albany Panic and Phobia Questionnaire (AAPQ; Brown, White, & Barlow, 2005; Rapee, Craske, & Barlow, 1994). This subscale measures fear of activities that cause physical sensations (e.g., blowing up an airbed, running upstairs, hiking on a hot day). The interoceptive subscale is comprised of eight items that reflect activities that produce somatic sensations. Patients are asked to provide ratings on a continuum of 0 (*no fear*) to 8 (*extreme fear*); the measure is scored by summing patients' ratings. The interoceptive scale has a reliability estimate of Cronbach's $\alpha = .86$. It has demonstrated concurrent validity with other measures of somatic symptoms of anxiety, and discriminant validity with measures that assess other domains of anxiety (Brown et al., 2005). Cronbach's alpha in this study was .82 at Time 1 and .81 at Time 2.

Anxiety—The Anxiety subscale of the Depression Anxiety Stress Scales (DASS; Lovibond & Lovibond, 1995) consists of 14-items. Participants provided responses using a scale ranging from 0 (*did not apply to me at all*) to 3 (*applied to me very much, or most of the time*) to questions that assessed anxiety symptoms over the past week (e.g., 'I felt scared without any good reason'). The DASS anxiety subscale has demonstrated good internal consistency (Cronbach's $\alpha = .92$) and convergent validity ($r = .84$) with other measures of anxiety (Antony, Bieling, Cox, Enns, & Swinson, 1998). Cronbach's alpha in this study was .88 at Time 1 and .83 at Time 2.

Health care utilization—The treatment experiences subscale of the Kelner Illness Attitude Scale (IAS; Crossmann & Pauli, 2006; Dammen, Friis, & Ekeberg, 1999; Kelner

1986; Kelner, 1987) is a three-item scale that assesses health care utilization. Patients indicated the number of caregivers seen, as well as frequency of treatment, over the past year. The treatment experience subscale has demonstrated good reliability ($\alpha = .75$, two week test-retest reliability, $r = .85$; Crossmann & Pauli, 2006). Cronbach's alpha in this study was .68 at Time 1 and .74 at Time 2.

Data Analytic Plan

After data were cleaned, chest pain, anxiety, interoceptive fear, and health care utilization were examined for normality at both time points. All variables demonstrated relatively normal distributions (skewness and kurtosis values $< \pm 1$) except for a positive skew in interoceptive fear and anxiety at both time points. Log transformations were used to normalize the distributions of the skewed variables. Chi-squared and t-tests were used in the attrition analyses to determine whether those who completed the study at both time-points systematically differed from those who only completed Time 1. Differences on the study variables (chest pain, general anxiety, interoceptive fear, and health care utilization) between Time 1 and Time 2 were examined through paired-samples t-tests. A Bonferroni correction was applied to account for the multiple analyses above. Frequencies and descriptives of chest pain characteristics were analyzed and provided below. The main analyses involved performing correlations between all study variables (chest pain, general anxiety, interoceptive fear, and health care utilization) at Time 1. Next, the variables that were significantly correlated to health care utilization were regressed onto health care utilization in a single-step linear regression model to determine which variables accounted for a significant amount of independent variance in health care utilization at Time 1. Due to suspected multicollinearity between general anxiety and interoceptive fear (at Time 1), two separate analyses were performed regressing general anxiety and chest pain onto health care utilization (at Time 1) and then regressing interoceptive fear and chest pain onto health care utilization (at Time 1). Prospective analyses involved examining correlations between chest pain, general anxiety, and interoceptive fear at Time 1 to health care utilization at Time 2. Variables that were significantly correlated to healthcare utilization at Time 2 were then regressed onto this variable in a linear regression.

Results

Response Rate and Attrition

There were 196 study completers at Time 1 and 70 completers at Time 2. The response rate in this study was 36% at one-year follow-up (Time 2). Attrition analyses showed no significant differences across demographic characteristics (i.e., ethnicity, gender, age, and level of education) or across treatment variables (i.e., chest pain, general anxiety, interoceptive fear, and healthcare utilization at baseline) for those who completed the study compared to those who did not complete participation. These findings suggest that there is not a response bias in effect for study completion. Further, paired samples t-tests examining change in the study variables across time, indicated that there were not significant differences between Time 1 and Time 2 for general anxiety, interoceptive fear, or healthcare utilization. Findings indicated a significant decrease in chest pain between Time 1 and Time 2. The means, standard deviations and significance values for tests of difference for chest pain, anxiety, interoceptive fear, and healthcare utilization are reported in Table 2. A Bonferroni correction was applied to the above analyses, indicating significance at $p < .004$.

Chest Pain Characteristics

At Time 1, 80% of the sample reported having had chest pain for one month or longer with over half (55%) reporting chest pain for more than six months. The majority of participants indicated chest pain episodes lasting five minutes or longer (61.7%) with over a quarter

reporting chest pain episodes lasting longer than one hour (27.2%). Average pain intensity was rated at 4.5 ($SD = 2.37$) on a 0 – 10 scale. About half of the sample (51%) reported chest pain episodes occurring at least weekly, with 9.8% reporting chest pain episodes several times per day.

At Time 2, average pain intensity was reported at 3.4 ($SD = 2.36$) on a 0 – 10 scale. Half of the sample reported chest pain episodes lasting five minutes or longer with 14% reporting episodes lasting longer than one hour. Just under half (47%) reported chest pain episodes occurring weekly and 4% reported chest pain episodes several times per day. See Table 3 for all categories of chest pain characteristics at Time 1 and Time 2.

Relations among Chest Pain, Interoceptive Fear, Anxiety, and Health Care Utilization

Time 1—Results of correlation analyses show that at Time 1 chest pain, interoceptive fear, and general anxiety were significantly correlated with health care utilization. The r values for these analyses were .18, .24, and .20, respectively ($ps < .05$), indicating small effect sizes (Cohen, 1992).

A linear regression model examined the amount of variance in health care utilization at Time 1 accounted for by chest pain, interoceptive fear, and anxiety (all at Time 1). The model was significant: $F(3, 174) = 5.05, p < .05$; adjusted $R^2 = .06$, with a small effect size: $f^2 = .06$ (see Table 4 for Beta values). Although the model was significant, none of the individual variables accounted for a significant amount of independent variance in healthcare utilization. This was likely due to multicollinearity between the predictor variables. Since general anxiety and interoceptive fear at Time 1 were relatively highly correlated ($r = .45, p < .05$), the regression model was rerun as two separate regression models; one including chest pain and general anxiety, and the other including chest pain and interoceptive fear. The first model was significant: $F(2, 181) = 5.31, p < .05$; adjusted $R^2 = .05$, with a small effect size: $f^2 = .05$. In this model, anxiety at Time 1 accounted for a significant amount of independent variance in health care utilization at Time 1 (Beta = .16, $p = .04$), while chest pain at Time 1 did not (Beta = .14, $p = .06$). The second model was also significant: $F(2, 176) = 6.88, p < .05$; adjusted $R^2 = .06$, with a small effect size: $f^2 = .06$. In this model, interoceptive fear at Time 1 accounted for a significant amount of independent variance in health care utilization at Time 1 (Beta = .20, $p < .01$), while chest pain did not (Beta = .14, $p = .06$).

Prospective Analyses—Extending our cross-sectional findings, we investigated correlations among chest pain, interoceptive fear, and anxiety, at Time 1, and health care utilization at Time 2. Interoceptive fear at Time 1 was significantly associated with health care utilization at Time 2 ($r = .25; p < .05$). Chest pain ($r = .08; p = .54$) and anxiety ($r = .17; p = .17$) at Time 1 were not significantly related to health care utilization at Time 2. A regression model examined the relation of interoceptive fear at Time 1 to health care utilization at Time 2. Since Time 1 chest pain and anxiety were not correlated with health care utilization at Time 2, they were not entered into the regression model. Interoceptive fear at Time 1 accounted for 5% of the variance in health care utilization at Time 2 (adjusted $R^2 = .05$): $F(1, 64) = 4.36, p < .05$, with a small effect size $f^2 = .05$ (Beta = .25, $p < .05$).

Discussion

The primary goal of this study was to examine chest pain and specific facets of anxiety (general anxiety and interoceptive fear) and their longitudinal relation to persistent health care utilization in patients with NCCP. Findings indicate that while chest pain decreased between Time 1 and Time 2, health care utilization did not decrease; suggesting that other aspects of NCCP may be driving health seeking behaviors. At Time 1, both general anxiety

and interoceptive fear were significantly associated with health care utilization, however, only interoceptive fear predicted health care utilization at one-year follow-up. Patients with higher levels of interoceptive fear were more likely to seek health care services over time. These findings suggest that interoceptive fear is more specifically indicative of likelihood to use health care as opposed to a general factor of anxiety, or chest pain severity alone. This is consistent with theoretical models of NCCP which emphasize that individuals with this syndrome tend to misinterpret benign physical sensations, are hypervigilant to cardiac sensations, and tend to have specific worries about their heart (White & Raffa, 2004). This finding suggests that a specific aspect of anxiety, interoceptive fear, may be uniquely important in NCCP health care utilization behaviors; patients with NCCP who experience interoceptive fear may be more likely to repeatedly present in medical settings. Minimizing unnecessary health care utilization among patients with NCCP may benefit both the patients and the health care system. Additional clinical research is needed to examine effective interventions to reduce unnecessary health care utilization among this patient population.

The findings of this study may have clinical implications. Interoceptive fear may be a target for intervention research with patients with NCCP. Interoceptive exposure may serve to reduce patient fear and avoidance of cardiopulmonary sensations and activities (e.g., exercise, taking a hot shower, climbing stairs). Interoceptive exposure exercises have been implicated as important components of treatment for health anxiety, or illness anxiety more generally (Taylor & Asmundson, 2004). Catastrophic beliefs regarding the outcome of physical sensations are a component of many somatically-presenting disorders (i.e., "Chest pain means heart attack, which means death. Chest pain means death."). Interoceptive exposures can provide in vivo evidence that disconfirms catastrophic beliefs about cardiopulmonary sensations. The present study provides additional evidence regarding the importance and appropriateness of including specific interventional strategies for interoceptive fear to interventions for NCCP.

Directions for Future Research

Few studies to date have examined predictors of health care utilization among patients with NCCP. Previous cross-sectional research has shown that anxiety disorders (White et al., 2008), general health perceptions, vitality, and acid regurgitation are associated with health care seeking behaviors in this population (Eslick & Talley, 2004). Further, a population study conducted in China demonstrated that those who were female, experienced gastroesophageal reflux disease (GERD), or had disruptions in social life due to NCCP were more likely to have higher rates of health care utilization (Wong et al., 2004). In the current findings, interoceptive fear accounted for only 5% of the variance in healthcare utilization at one-year follow-up. Future research may benefit from investigating other factors that also contribute to healthcare utilization over time in conjunction with interoceptive fear, such as the above variables (i.e., anxiety disorders, general health perceptions, vitality, acid regurgitation, gender, GERD, and disruption in social life) to identify which of these variables are the most significant predictors of health care utilization. Future research is also warranted to investigate other, as of yet unexplored, factors that contribute to health care utilization over time. These may include specific types of cognitions associated with non-harmful chest sensations (such as the tendency to catastrophize), and the impact of family illness experience. As factors that predict health care utilization over time for patients with NCCP are better understood, it may become possible to identify clinically those who are likely to over-utilize health care and to provide appropriate treatments as they are developed.

Methodologically, research to date has largely used self-report measures of health care utilization in this patient group (Eslick & Talley, 2004; Tew et al., 1995). Studies that use multiple measures of health care utilization would further clarify these relations. Medical

records, reports from general practitioners and emergency departments, or insurance company records, may increase accuracy of measures of health care utilization.

Conclusion

This study expanded research in this area by examining the one-year prospective relation of anxiety and health care utilization in patients with NCCP. Our findings help clarify the role of anxiety in health care utilization in patients with NCCP and identify interoceptive fear as an important factor in understanding the persistent medical-seeking behaviors of some patients with NCCP. Replication of this study is needed. Our results may have implications for informing NCCP interventions.

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Table 1**Participant Demographics**

Demographic Variable	Time 1 Frequency (Percentage)	Time 2 Frequency (Percentage)
Employment		
Full – Time	113 (58%)	42 (58%)
Part – Time	29 (15%)	12 (17%)
Homemaker	4 (2%)	2 (3%)
Unemployed	13 (7%)	7 (10%)
Disability	10 (5%)	1 (1%)
Retired	24 (12%)	8 (11%)
Student	2 (1%)	0 (0%)
<i>n</i>	195	72
Level of Education		
Less than High School	2 (1%)	0 (0%)
12 th Grade or GED	20 (10%)	6 (9%)
Some College	26 (13%)	8 (12%)
Vocational/Trade School	11 (6%)	3 (4%)
Associates Degree	14 (7%)	6 (9%)
Bachelor Degree	56 (29%)	16 (23%)
Post Graduate Degree	67 (34%)	30 (44%)
<i>n</i>	196	69
Ethnicity		
Alaskan Indian or Alaska Native	1 (0.5%)	0 (0%)
Asian or Asian American	1 (0.5%)	0 (0%)
African American	22 (11%)	7 (10%)
Caucasian	164 (85%)	58 (85%)
Hispanic or Latino	4 (2%)	3 (4%)
Other	2 (1%)	0 (0%)
<i>N</i>	194	68

Total percentages not equal to 100 are due to rounding.

Employment data collected at Time 1 and Time 2; level of education and ethnicity data collected only at Time 1. The above presentation of Time 2 level of education and ethnicity data includes only participants who completed Time 2 (using data collected at Time 1).

Table 2

Results of t-tests between time-points: Means, Standard Deviations, and significance levels of Chest Pain, Anxiety, Interoceptive Fear, and Health Care Utilization (HCU).

	Mean	Standard Deviation	P
Chest Pain (Time 1)	2.57	1.30	
Chest Pain (Time 2)	2.08	1.24	.00*
Anxiety (Time 1)	1.54	0.94	
Anxiety (Time 2)	1.45	0.85	.25
Interoceptive Fear (Time 1)	1.95	1.11	
Interoceptive Fear (Time 2)	1.65	1.24	.01
HCU (Time 1)	2.85	0.85	
HCU (Time 2)	2.83	0.79	.83

* A Bonferroni correction indicates significance at $p < .004$.

Table 3

Chest Pain Characteristics at Time 1 and Time 2.

Demographic Variable	Time 1 Frequency (Percentage)	Time 2 Frequency (Percentage)
How long have you had chest pain?		
7 days or less	29 (15%)	N/A *
More than 7 days/less than one month	8 (4%)	N/A *
1 month – 6 months	49 (26%)	N/A *
6 months – 1 year	29 (15%)	N/A *
> 1 year	76 (40%)	N/A *
<i>N</i>	188	N/A *
How long do your chest pain episodes usually last?		
A few seconds	31 (17%)	13 (20%)
Less than 5 minutes	41 (22%)	19 (30%)
5 – 20 minutes	47 (25%)	18 (29%)
21 – 60 minutes	18 (10%)	5 (8%)
More than one hour	20 (11%)	2 (3%)
About half the day	11 (6%)	3 (5%)
All day or longer	15 (8%)	2 (3%)
The pain is continuous, it does not stop	5 (3%)	2 (3%)
<i>n</i>	188	64
How often do you experience chest pain?		
Several times per day	19 (10%)	3 (4%)
Less than daily (every other day)	19 (10%)	6 (9%)
About daily	19 (10%)	6 (9%)
About weekly	42 (22%)	18 (26%)
About monthly	37 (19%)	16 (23%)
Never or rarely	58 (30%)	21 (30%)
<i>N</i>	194	70

Total percentages not equal to 100 are due to rounding.

* Since data at Time 2 was collected one year following Time 1 (when all participants endorsed chest pain), all participants at follow-up would have had at least a one-year history of (a) chest pain episode(s).

Table 4

Variance in Health care Utilization at Time 1 Accounted for by Chest Pain, Anxiety and Interoceptive Fear (at Time 1).

Predictor	Beta	<i>p</i>
Chest Pain	.13	.08
Anxiety	.11	.20
Interoceptive Fear	.15	.08