



Investigating the effect of anxiety sensitivity, gender and negative interpretative bias on the perception of chest pain

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Abstract

Research suggests that anxiety sensitivity may be an important component in the negative response to pain sensations, especially those with cardiopulmonary origin. Furthermore, there is experimental evidence to suggest that such effects may be stronger in women than men. The primary aim of the current investigation was to determine the relative roles that anxiety sensitivity and gender have on the pain reports of patients referred to a hospital clinic with chest pain. A total of 78 female and 76 male adults were recruited on entry to a Rapid Access Medical Clinic. All patients had been referred with chest pain, and were administered a range of pain and anxiety measures prior to diagnosis. Results indicate that males were more likely to receive a diagnosis of cardiac chest pain, whereas females were more likely to receive a diagnosis of non-cardiac chest pain. Additionally, anxiety sensitivity was related to pain in women but not men. Finally, evidence was found for the mediating effect of negative interpretative bias on the relationship between anxiety sensitivity and pain. However, this mediating effect was only found in women. These results not only confirm that anxiety sensitivity is related to greater negative pain responses in women, but that this may be due to an increased tendency to negatively interpret sensations.

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Chest pain is a major symptom associated with coronary heart disease (CAD), angina pectoris, and myocardial infarction. Given this link, it is understandable that chest pain is not only a source of great anxiety for patients, but also accounts for a high number of physician and emergency room visits (e.g. [Albertsson et al., 1997](#)). Interestingly, anxiety may be more than just a consequence of chest pain, in that it is believed to serve as an important vulnerability factor in the development of CAD ([Fleet et al., 2000](#); [Jeejeebhoy et al., 2000](#); [Kiecolt-Glaser et al., 2002](#); [Krantz and McCeney, 2002](#); [Kubzansky and Kawachi, 2000](#)). It would, therefore, seem important to

understand the role that anxiety has in the experience of chest pain.

One psychological construct that may help account for negative responses to chest pain is anxiety sensitivity. Anxiety sensitivity is defined as the fear of anxiety-related sensations, and is not only an important factor in predicting negative responses to pain (for reviews see [Asmundson, 1999](#); [Keogh and Asmundson, 2004](#)), but is also specifically related to increased heartbeat awareness ([Eifert et al., 2000](#); [Schmidt et al., 2001](#); [Sturges and Goetsch, 1996](#)) and intensity of cardiac symptoms ([Aikens et al., 2001](#)). Furthermore, it also seems that the mechanism by which anxiety sensitivity is related to pain responses is due to an increased tendency to interpret bodily sensations in a negative manner ([Keogh and Cochrane, 2002](#)). It is possible that anxiety sensitivity may not only predict chest pain experiences, but may also

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point to psychological reasons for the existence of such a relationship.

If anxiety sensitivity is related to the experience of chest pain it is also very likely that important gender differences may be operative in this context. Men and women differ with respect to chest pain symptoms and outcome, in that women report experiencing more visceral pain sensations than men (Abbey and Stewart, 2000; Eslick et al., 2003; Fillingim, 2000; Kyker and Limacher, 2002; Roeters van Lennep et al., 2002; Wenger, 2002). Furthermore, the effects of anxiety sensitivity on experimental pain are moderated by gender, in that anxiety sensitivity is related to higher pain sensitivity in women, but not men (Keogh and Birkby, 1999).

The above review indicates that anxiety sensitivity, negative interpretative bias and gender may all be important in the experience of chest pain. However, no research to date has examined all these variables together in the same study. The primary objective of the current investigation was, therefore, to determine the relative roles these three factors have on patient experiences of chest pain. We specifically predicted that:

1. anxiety sensitivity would be related to higher negative pain experiences;
2. negative interpretative bias would mediate the relationship between anxiety sensitivity and pain;
3. gender would moderate the above-mentioned relationships.

1. Method

1.1. Participants

A total of 154 adults were recruited from the Rapid Access Medical Clinic (RAMC) at Bromley Hospital NHS Trust, United Kingdom. There were 78 females and 76 males. Age ranged between 29 and 84 years (mean = 61.27 years, SD = 11.94). The majority were married or living with a partner (70%), and the remainder were either single (4%), divorced/separated (9%) or widowed (10%). Eighty-two percent classified themselves as White European, and 61% reported having some educational qualification, e.g. O-levels, A-levels, higher degree, professional qualification. Patients were screened and excluded from participating if they reported previous mental health problems, and/or known cardiac history (e.g. angina). Given the questionnaire nature of the study, patients who had English as a second language were excluded, as were children and patients from vulnerable groups (as ascertained from medical records, physician referral, etc.). All participants had been referred to the RAMC by their general practitioner or a physician following a new episode of chest pain, and so at this stage were considered acute pain patients.

1.2. Questionnaire measures

1.2.1. Anxiety sensitivity index (ASI; Reiss et al., 1986)

The ASI consists of 16 items designed to assess an individual's fear of anxiety-related sensations. It contains items relating to cardiac sensations, as well as items relating to social and cognitive concerns. Respondents are asked to indicate on a 5-point scale (scored 0–4) how much they agree with each item, which is summed to produce a total ASI score. Internal consistency of the ASI is good, with Cronbach's alpha ranging from 0.82 to 0.91, and test–retest reliability has been reported to be 0.71 for college students over a 3-year period (Maller and Reiss, 1992; Peterson and Plehn, 1999).

1.2.2. McGill pain questionnaire (MPQ; Melzack, 1975)

The MPQ served as the measure of pain. The MPQ consists of 78 adjectives grouped into 20 subclasses describing different aspects of pain. These sub-scales can further be split into four categories of pain descriptors: sensory, affective, evaluative and miscellaneous. Patients are instructed to circle the words that best describe their pain for each of the 20 subclasses. Pain scores are determined using the rank values technique, which involves ranking each word within each subclass. These values are then added up to obtain a pain rating index for each of the four main categories, as well as a total pain index. In their review of pain measures, Melzack and Katz (1999) report that the MPQ is a valid, reliable, consistent and useful method of assessing pain. The MPQ has good discriminant validity, in that it is able to discriminate between different pain conditions. They also report that there is good evidence for consistency across a range of different cultural and educational groups.

1.2.3. General health questionnaire: 12-item version (GHQ; Goldberg and Hillier, 1979)

The GHQ was administered to assess general mental health. Respondents are instructed to rate each item on a 4-point Likert-type scale, ranging from 0 ('Not at all') to 3 ('Much more than usual'). Scale items are couched in terms of how the person has been feeling over the past few weeks, and higher scores are generally taken to indicate greater degrees of mental ill-health (Banks et al., 1980). The GHQ is one of the most widely used psychometric measures in health and psychiatry and has good reliability and validity (e.g. Goldberg et al., 1997; Werneke et al., 2000).

1.2.4. Body sensations interpretation questionnaire (BSIQ; Clark et al., 1997)

The BSIQ consists of 27 ambiguous scenarios related to panic-related bodily sensations (e.g. chest sensation), social events (e.g. someone laughing), external events (e.g. noise at night), and other bodily symptoms that are not crucial to panic disorder (e.g. skin spot). For each scenario, respondents are presented with three possible explanations,

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