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Cardiac instrument development in a low-literacy population: The revised Chest Discomfort Diary

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Abstract

OBJECTIVE—The purpose of this study was to pilot test a self-administered chest pain questionnaire, a revised version of the Chest Discomfort Diary (CDD-R), in a sample of patients with chronic angina selected from a population known to have low literacy.

DESIGN—The study design was descriptive and correlational.

SAMPLE—The study used a convenience sample of 27 subjects with documented history of coronary artery disease and angina. Characteristics of the sample included a mean age of 56.3 years (SD, 12.4 years), 88.9% African-American, and 56.3% male, and 59.3% had a history of acute myocardial infarction. Approximately 28% had achieved a 9th-grade education or less, and reading levels ranged from 4th grade to 12th grade. Subjects completed the CDD-R, a 36-item instrument reflecting multiple dimensions of anginal chest pain.

RESULTS—Descriptions of the location (left chest, 66.6%), character (pressure, 59.2%), and precipitants of chest pain (walking, 51.8%) were consistent with clinical descriptions of “typical angina.” Other physical symptoms such as shortness of breath (88.8%) and fatigue (85.1%) were reported. Walking (55.5%) was the activity most frequently described as difficult to perform because of chest pain, with sublingual nitroglycerin (77.7%) the most frequently used and most effective chest pain relief strategy.

CONCLUSION—The CDD-R adequately measured multiple characteristics of anginal chest pain. Further research is needed to establish construct validity of the CDD-R and to determine the feasibility of using the instrument to monitor changes over time in patients’ chronic angina. (*Heart Lung*® 2001;30:312–20.)

Coronary artery disease (CAD) accounts for more morbidity and mortality in the United States and other industrialized nations than any other disease entity, with approximately 14 million persons having a history of acute myocardial infarction (AMI) and/or angina pectoris.¹ Minorities and socioeconomically disadvantaged persons, such as persons with less education, are at greater risk for negative cardiac outcomes,¹ including difficulty managing acute chest pain symptoms^{2,3,4} and poorer cardiac-related quality of life.⁵ More

research is needed to understand how vulnerable patients with CAD perceive, interpret, and manage their cardiac symptoms, but the higher prevalence of low literacy among minorities and persons with lower socioeconomic status⁶ creates substantial barriers to conducting cardiac symptom-based research. Symptom assessment questionnaires are often written at reading levels that are too high for persons with low literacy to comprehend, and this may lead to lower reliability and validity of instruments. Even when researchers include vulnerable populations in research studies as mandated by their funding agencies,⁷ they may be unsure of how to address congruence between reading levels of study instruments and subjects' literacy levels and thus ignore this important issue. Research instruments appropriate for low-literacy patients are necessary for investigating changes in cardiac symptoms over time and testing symptom management interventions in patients with CAD at risk for negative cardiac outcomes. Therefore, the purpose of this study was to pilot test a self-administered chest pain questionnaire, a revised version of the Chest Discomfort Diary (CDD-R), in a sample of chronic angina patients selected from a population known to have low literacy levels.

REVIEW OF THE LITERATURE

The problem of low literacy

The National Literacy Act defines literacy as “an individual’s ability to read, write, and speak in English, compute and solve problems in levels of proficiency necessary to function on the job and in society, to achieve one’s goals, and develop one’s knowledge and potential.”⁶ In the United States, problems with literacy are pervasive. Approximately 20% of adults read at or below the 5th-grade level. Forty million adults are essentially illiterate and unable to perform basic functions such as reading a newspaper, using a map, or understanding signs in a department or grocery store.⁶ Socioeconomic status and literacy are strongly linked. Among persons with the lowest literacy skills, 43% are impoverished and 70% do not have full-time jobs.⁶ Low literacy is present in a disproportionate number of members of minorities, with Hispanic persons having the highest illiteracy levels.⁶

Low literacy and health

Low literacy in patients is associated with poorer health status.⁸ Independent relationships between low literacy and health are often difficult to study because low literacy is also strongly associated with lower socioeconomic status, another powerful predictor of poorer health status.⁹ Adequate health screening, compliance with the therapeutic regimen, and access to health care may be jeopardized in low-literacy patients because of difficulty reading and comprehending patient care education materials, prescriptions, and appointment slips.⁶ Moreover, low-literacy patients may be unable to advocate for themselves with health care providers and payers. Because low literacy is a significant source of shame,^{10,11} patients may not readily disclose low literacy to health care professionals; thus, low-literacy-based problems in the health care system may persist for months and years and potentially may have an adverse effect on health outcomes.¹²

In clinical research, low literacy among potential subjects may have a strong, yet covert impact on the investigators' ability to successfully implement study. For example, patients

may mask the fact that they cannot read by stating that they are tired, are in a hurry, or have forgotten their glasses¹³ and refuse to participate in the study. Even when subjects consent to participate in the study, face validity of an instrument may be jeopardized if the words and sentence structure are too complicated. Subjects may have poor comprehension of the information the questionnaire is attempting to elicit and may ask for clarification of items or leave the items blank. If a research assistant provides inconsistent explanations for the meaning of items, error variance in subjects' responses may increase. Lowliteracy subjects may also require more time to complete a battery of study instruments, increasing subject burden and the need for research assistant supervision.

Instruments to assess literacy

An inadequate approach to assessing literacy levels of subjects is the usual tactic of obtaining information about their educational levels. Although lower educational levels may suggest that lower literacy could be a problem, the two are not always correlated.⁶ For example, in a small study of psychiatric outpatients, Baker et al¹⁴ found that 63% of middle-aged and elderly patients read a median of 5 years below their educational level. A review of the literacy literature revealed the following 3 major types of literacy screening instruments relevant for health care practice and research: medical literacy questionnaires, functional health literacy tests, and general literacy screening tools.

Medical literacy questionnaires evaluate whether patients can read and comprehend health education material (ie, function as screening instruments to assess which format of health education material is most appropriate). An example of this type of literacy instrument is the Rapid Estimate of Adult Literacy in Medicine (REALM).¹⁵ This 66-item instrument includes common lay and medical terms used in the outpatient setting such as "germs" and "nausea." To screen for medical literacy, the patient reads each item aloud and a raw score is obtained of items read correctly. Based on the raw score, a determination is made for what grade level of health education materials would be most appropriate for the patient and whether using more audiovisual educational materials such as audio cassettes or videotapes are preferable to written educational materials. The REALM has documented reliability and validity¹⁵ and takes only 2 to 3 minutes to complete. A weakness of the instrument is that the ability to read and comprehend health education materials is assumed based solely on patients' oral word recognition ability; therefore, validating patients' understanding of written materials is always good clinical practice.

Functional health literacy is a broader and more complex concept focused on assessing whether patients have the requisite skills to successfully negotiate the health care system. Examples include reading labels of prescription bottles, understanding information on appointment slips, completing insurance forms, and following instructions pertaining to diagnostic tests.¹⁶ The Test of Functional Health Literacy in Adults (TOFHLA)¹⁷ is a reliable and valid measure of functional health literacy.¹⁶ Unlike the REALM, where patients read lists of words, the TOFHLA includes examples of prescriptions, appointment slips, and other information and requires patients to read and interpret them. A strength of the instrument is that it assesses both reading comprehension and numeracy (whether numbers can be used and interpreted). The TOFHLA assesses response to a situation; for

example, if the patient had a prescription to take a pill every 6 hours, would they know when the next pill would be due if they took a pill now? The score on the TOFHLA is summed, and subjects are categorized as having “inadequate,” “marginal,” or “adequate” functional health literacy. The main disadvantage of the TOFHLA is that the short form takes 20 minutes for patients to complete; thus, its usefulness as a quick screening method is limited. However, the TOFHLA may provide the most relevant estimate of literacy as it relates to health issues such as compliance.

General literacy screening tools measure patients’ basic ability to read common vocabulary words. These screening measures may be most useful when health care researchers or providers are interested in determining the general literacy level of patients but do not want to focus solely on health care–related terminology. An example of this type of measure is the revised Slosson Oral Reading Test (SORT-R).¹⁸ The SORT-R consists of 10 lists of 20 words each with word lists arranged in increasingly difficult order. Similar to the REALM, subjects read the word lists aloud and a raw score is obtained of correctly pronounced words. Validity of the SORT-R was established with concurrent administration of the SORT-R with the Peabody Individual Achievement Tests and the Woodcock-Johnson Tests of Achievement.¹⁸ Correlations between the SORT-R ranged from .83 to .93 for reading recognition subscales of the achievement tests and from .68 to .83 for reading comprehension.¹⁵ Test-retest reliability was reported as .98 and internal consistency using the Kuder-Richardson formula was .98.¹⁸

An advantage of the SORT-R is that subjects may begin reading on any list where they feel most comfortable. If subjects can read all the words on a harder list it is assumed they can read words on an easier list; thus, they do not have to read all 200 items for the test to be scored. The SORT-R takes approximately 2 to 5 minutes to administer. Based on the list where subjects began reading and the number of correctly pronounced words, a raw score is obtained. The possible range of raw scores on the SORT-R is 0 to 200 with higher scores indicating higher reading levels. By using a table from the scoring manual,¹⁸ the raw score can be converted to approximate reading grade level ranging from about the 1st grade (raw score of 3) to 12th grade (raw scores of 189 to 200). The SORT-R does not assess literacy levels above the 12th grade, so there is a ceiling effect for adults with college-level literacy. Because the raw score only approximates the reading grade level, raw score conversions to reading grade levels are considered ordinal data.¹⁸

The investigators chose to use the SORT-R as the screening test for literacy in this study because the research questions did not focus on ability to read patient education materials or functional health literacy. The instrument evaluated in the study, the CDD-R, consisted of more general vocabulary words dealing with patients’ perceptions of anginal pain; thus, a general screening measure seemed to be more appropriate.

METHODS

Setting and sample

This descriptive methodologic pilot study was conducted in an outpatient cardiology clinic of a large urban public hospital in an area of the southeastern United States known to have a

large prevalence of indigent patients with low literacy.¹⁶ The convenience sample included 27 subjects who had the following characteristics: 1) had a documented history of CAD; 2) experienced an episode of chest pain in the previous 3 months; 3) had chest pain characteristics consistent with angina pectoris as assessed by a supplemented version¹⁹ of the Rose Questionnaire (RQ-S)^{20,21}; and 4) had a documented literacy level of 4th grade or higher as measured by the SORT-R.¹⁸ The minimum literacy level cutoff was chosen so that subjects' literacy levels would be congruent with the CDD-R, which was written at a 4th-grade reading level. There was no exclusion criterion for maximal reading level to participate in the study.

Procedures

Inclusion criteria screening occurred in a stepwise manner. First, research assistants identified potential subjects with CAD and angina through chart review of patients waiting to be seen in an outpatient cardiology clinic and ascertained whether patients had experienced chest pain with-in the previous 3 months. Patients who were symptomatic were then screened with the RQ-S¹⁹ to determine whether their chest pain was likely to be angina rather than chest pain from a noncardiac source such as a musculoskeletal problem. The original Rose Questionnaire has demonstrated reliability and validity as a screening tool for the presence of angina^{20,21} and has been successfully used in large epidemiologic studies of white, African American, and Hispanic subjects.²² Concern about the sensitivity of the Rose Questionnaire in identifying angina in persons with more atypical anginal symptoms prompted Bass et al¹⁹ to supplement the Rose Questionnaire with additional questions about relief of pain with nitroglycerin and nonexertional chest pain, resulting in the creation of the RQ-S. Because women are more likely to have atypical symptoms,²³ the researchers thought that using the RQ-S to screen patients for this study rather than the original Rose Questionnaire would increase the likelihood of women meeting the "chest pain characteristics consistent with angina" inclusion criterion. The RQ-S was used as a screening instrument rather than the primary measure of anginal pain because it was originally designed to be a screening tool, and the items on the RQ-S did not comprehensively measure angina from a multi-dimensional pain perspective. The RQ-S is scored as "positive" or "negative" for angina based on how subjects endorse various items on the tool. Potential subjects who rated "positive" for angina were considered to have met the inclusion criterion.

The screening process was completed with administration of the SORT-R. All screenings were conducted in a private conference area. Research assistants handled the literacy screening process with sensitivity and tact to minimize psychologic discomfort when low literacy was identified.

One hundred and forty patients with documented CAD were screened for possible participation in the study. Forty-three (37.7%) were ineligible for participation because they were asymptomatic for chest pain in the previous 3 months. Six patients (5.2%) refused to be screened for literacy and/or angina, 22 (19.3%) had estimated reading levels below the 4th grade, 14 (12.3%) did not meet the criterion for presence of angina as measured by the RQ-S, and 7 (6.1%) had both literacy levels of lower than 4th grade and were negative for

angina as measured by the RQ-S. Eleven (9.6%) did not complete the screening because of frailty, not having their glasses, or the screening process was interrupted. Five patients (4.4%) were excluded from participating because of questionable mental status, inability to differentiate angina pain from non-cardiac pain, or because they were erroneously scored as “negative” for angina on the RQ-S. Five patients (4.4%) who met all the eligibility criteria refused to participate, citing reasons such as not wanting to sign the consent form, lack of interest, or because they were unsure of whether the physician would approve; thus, a total of 27 subjects participated in the study.

After informed consent was obtained, demographic and clinical data were obtained and subjects completed the CDD-R. Although a research assistant was present while the instrument was completed, subjects were encouraged to answer the questionnaire without assistance.

Demographic and clinical data—Demographic data about age, sex, ethnicity, and educational level were documented. In addition, selected clinical information was obtained about the length of time with CAD, history of AMI, coronary artery bypass surgery, and/or percutaneous transluminal coronary angioplasty and self-reported Canadian Cardiovascular Society Criteria classifications.²⁴

CDD-R—In its original form, the Chest Discomfort Diary (CDD)²⁵ was a 9-item questionnaire designed to be self-administered at the time anginal chest pain occurred. The original instrument measured anginal pain in the following 8 categories: activity before chest pain occurrence; mood before chest pain occurrence; pain location; pain intensity; pain descriptors; duration of pain; frequency of pain; and pain relief measures. With permission of the authors (personal communication, 1996), we reviewed and extensively modified the CDD to better reflect a multidimensional pain perspective advocated in the pain literature.²⁶ More specifically, items were included which reflected the physio-logic, affective, sensory, cognitive, and behavioral dimensions of the pain experience.²⁷ The revised version of the CDD, the CDD-R, was reviewed by a panel of clinical experts representing cardiac nursing, pain management, and medicine and was judged to have content validity.

We assessed the reading level of the CDD-R by using the standard readability analysis available in Microsoft Word. Readability statistics suggested that the instrument was written at the 9th-grade reading level according to the Flesch-Kincaid formula.²⁸ In consultation with clinicians at the urban hospital where the pilot study was conducted, we thought that the reading level was unacceptably high for use at the study site. Following recommendations from the literacy literature and consultation from an editor of children’s books, the reading level of the CDD-R was lowered to the 4th grade. This was mainly accomplished by simplifying words and sentence structure. To establish face validity, this early lower reading grade level of the CDD-R was piloted with 20 subjects from the urban hospital. Subjects reported difficulty completing the items to the research assistants. We revised the instrument again, placing items with similar response sets together and providing more explicit instruction to subjects about how to complete the instrument. Thus, the 4th-grade reading level version of the CDD-R used in this present pilot study had 36 items representing anginal chest pain from the multiple pain dimensions. Once reliability and

validity of the CDD-R are established, the instrument will be used in a larger study to measure weekly changes in chronic angina during a period of 6 months. It was administered only once in this study for the purposes of examining psychometric characteristics.

Analysis of the CDD-R involves obtaining Likert scores or frequencies on selected single items and summing Likert items which comprise the following 3 subscales: “other cardiac symptoms”; “emotional precipitants of angina”; and “extent of angina pain relief.” Possible range of scores for each of the subscales are 0 to 20, 0 to 28, and 0 to 40, respectively, with higher scores indicating greater severity of symptoms, greater negative emotions before the onset of chest pain, and greater pain relief. The instrument also lists 10 physical activities that may be more difficult or impossible to perform because of anginal chest pain. Subjects check the physical activities that are negatively impacted by their angina. Summing the activities checked by subjects provides an estimate of the extent of physical impairment secondary to angina. The range of perceived impairment of physical activity is 0 to 10, with higher scores indicating that subjects are having difficulty performing a greater number of physical activities. The remainder of the CDD-R is scored at the individual item level. Table I summarizes the items on the CDD-R and provides information about the item response formats and individual and subscale scoring for analytic purposes.

When the CDD-R was administered, the research assistants told subjects to report on chest pain symptoms they had experienced the day before completing the questionnaire. If subjects had not experienced a chest pain episode on the day before participating in the study, they were instructed to answer the questions based on their most recent chest pain episode.

RESULTS

Demographic and clinical data

Table II summarizes demographic and clinical data for the sample. The mean age was 56.3 years (SD, 12.4 years). Subjects had been diagnosed with CAD for an average of 4.3 years (SD, 3.0 years). The sample was composed primarily African American men who had a history of AMI. Slightly more than one third of the sample were married and 63% were either divorced or separated from their partner. Approximately 28% had not attended school beyond the 9th grade. The mean raw SORT-R score was 151 (SD, 34.6) with an observed range of 106 to 200, suggesting that, on average, the sample of patients could read at the reading level of grade Raw SORT-R scores indicated that slightly more than 48% of subjects (48.2%) had reading levels between the 4th and 6th grade, 25.9% read between 6th and 9th grades, and 25.9% read at the 12th grade or higher. No subjects were categorized as reading between the 9th and 12th grade levels. Raw SORT-R literacy scores and highest educational level obtained were significantly correlated (Kendall's τ , $b = .55$; $P = .001$).

Preliminary results of the CDD-R

Missing data—Initial examination of the CDD-R focused on the nature and extent of missing data. Missing data were most apparent on the CDD-R subscale of “emotional precipitants of chest pain,” with 33% to 49% missing data, depending on the item. The

emotional precipitants subscale involved subjects rating their emotions before the chest pain started by using a 7-point Likert-type scale. Interestingly, there were no missing data for single Likert items dealing with pain severity or emotional upset caused by pain or worry about health. This finding suggested that it was not the Likert-type format that was difficult for patients, but the directions for the subscale or the nature and/or grouping of the items. Other areas where missing data were present included items addressing where the pain started and the location to which it radiated. Anecdotal data from the research assistants suggested that subjects had difficulty conceptually differentiating between location of pain onset and location of pain radiation.

Internal consistency—The internal consistency reliability estimate for the “other cardiac symptoms” and “emotional precipitants of chest pain” subscales were .88 and .86, respectively. For the “extent of pain relief” subscale, an internal consistency reliability estimate could not be calculated. Subjects were asked to check what strategy they used to relieve their pain and then rate on a Likert scale how much pain relief they obtained. Only the following 3 of the 10 pain relief measure items were used by approximately 50% or more of subjects: taking nitroglycerin (77.7%); sitting down (59.2%); and stopping activity (48.1%). Cronbach α could not be calculated because none of the subjects provided Likert ratings for all pain relief measures. The reliability coefficients for the “other cardiac symptoms” and “emotional precipitants of chest pain” subscales are considered adequate for a newly revised instrument with subscales that have fewer than 10 items.²⁹

Summary of CDD-R findings—A majority of subjects had other cardiac symptoms besides chest pain, with shortness of breath (88.8%) and tiredness (85.1%) being the most frequently reported symptoms. The mean on the “other cardiac symptoms” subscale was 9.8 (SD, 5.9), suggesting that subjects were reporting a moderate level of severity of other potentially cardiac-related symptoms. On average, chest pain episodes had a duration of 4.7 minutes (SD, 3.9) and occurred most frequently between the hours of 2_{PM} and 6_{PM} (44.4%). Subjects’ angina episodes usually began in the left chest (66.6%) and were precipitated by walking (51.8%). The most common descriptors of angina were pressure (59.2%) and heaviness (44.4%) and the least common was throbbing (3.7%). Subjects reported that a mean of 1.2 activities (SD, 1.1) were harder to do because of chest pain, with walking (55.5%) the most commonly reported activity limited by symptoms. The mean level of emotional upset associated with chest pain was 3.8 (SD, 3.2), indicating that subjects were not highly troubled about their anginal episodes. Mean ratings for angina pain severity (mean, 4.4; SD, 2.1) and worry about health because of chest pain (mean, 5.5; SD, 3.4) were higher, suggesting that subjects had moderate levels of pain severity and worry about their health. The most commonly used chest pain relief measure was taking sublingual nitroglycerin (77.7%). None of the subjects reported that they talked to their spouses, friends, or doctors about their chest pain episodes.

The total number of physical activities reported to be difficult to perform because of chest pain was associated with severity of “other cardiac symptoms” ($r = 0.66$, $P = .04$). Greater emotional upset because of angina was associated with reports of greater chest pain severity ($r = 0.45$, $P = .02$) and worry about health ($r = 0.49$, $P = .01$).

DISCUSSION

The common characteristics of chronic angina are well described³⁰ from a clinical perspective. However, few reliable and valid instruments have been developed for assessing multiple dimensions of the chronic angina pain experience and even fewer are appropriate for use among low-literacy patients. Because of the small sample size, the results of this study should be interpreted with caution, but they suggest that the CDD-R, a multidimensional chest pain measure, had adequate psychometric properties in a sample of low-literacy subjects.

One major problem identified in using the CDD-R in this sample was missing data, particularly on the “emotional precipitants of pain” subscale. The subscale may have been problematic because the directions for completing the scale were different from the subscales preceding and following it. Subjects may have been confused about how to complete the items and simply left them blank. Consistency in directions and response sets is a critical aspect of instrument design and administration in low-literacy populations. In addition, it is important to reinforce that subjects should not leave any questions blank, but tempered with a clear explanation so that they don’t write in anything just to accomplish the task yielding data of questionable reliability.

Several anginal pain relief measures on the “extent of pain relief” subscale, particularly those involving talking to others about the pain, were not relevant for subjects in this study. We anticipate omitting some of these less pertinent pain relief items from the next version of the CDD-R and having only 1 Likert item for subjects to rate the extent of pain relief. This will likely improve the CDD-R’s usefulness in low-literacy populations by decreasing the total number of items on the instrument.

Thirty percent of the subjects in this study read below the 5th-grade level. This finding reinforces the need for study instruments to be written at as low a reading level as possible without compromising instrument integrity. Although there may be concern that questionnaires written at an elementary level may be offensive to subjects with high literacy, anecdotal data from the investigators’ research with higher-literacy subjects indicates that the lower reading level instruments were well-received.

Subjects’ descriptions of the location, character, and precipitants of pain were consistent with typical experiences of persons with chronic angina³⁰ as reported in clinical guidelines for management of chronic angina. This finding was expected and welcomed because it suggested that the instrument was measuring angina and not other forms of chest pain. Although all subjects who participated in this study had experienced chest pain within the previous 3 months, our study was limited because we did not ask subjects when they had last experienced chest pain. Subjects who completed the CDD-R based on a recent episode of pain might have different or more accurate pain recall compared with subjects who had not experienced angina for several weeks before entering the study.

Our long-term goal is to measure chronic angina along various pain dimensions over time to monitor changes in symptom status. We hypothesize that the CDD-R will provide a more systematic and uniform assessment of various dimensions of anginal chest pain. Our next

methodologic study will involve establishing construct validity of the CDD-R by administering it simultaneously with other reliable and valid generic pain instruments. To our knowledge, 2 of these pain instruments, the Brief Pain Inventory³¹ and the Short-Form of the McGill Pain Questionnaire,³² have rarely, if ever, been used in a chronic angina population. Both of these instruments have reading levels of between the 5th and 6th grades, with the most complicated words and sentence structure being in the directions for how to complete the instruments. We anticipate that with a few minor modifications of the Brief Pain Inventory and the Short-Form of the McGill Pain Questionnaire we will be able to assess construct validity of the CDD-R in low-literacy populations. In conclusion, research instruments appropriate for measuring cardiac symptoms have the potential for advancing clinical science. The findings reported represent the first steps toward developing a useful research instrument for studying low-literacy patients with chronic angina.

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Table 1

Item description, response format, and scoring of the CDD-R

Description of item	No. of items and response format	Scoring for analysis
Whether chest pain or discomfort occurred yesterday	1 item; check yes/no	Percent endorsed, yes or no
“Other physical symptoms experienced” subscale; includes symptoms such as tired, dizzy, and short of breath	5 items; Likert scale with anchors, “not bad at all” to “as bad as it could be”	Sum of Likert ratings; possible range for subscale score of 0–20
Chest pain frequency	1 item; circle number of episodes	Interval level data, number of episodes
Chest pain duration	1 item; circle number of minutes	Interval level data, number of minutes
Time chest pain episode occurred in 4-hour intervals representing a 24 hour period; for example, between 6 _{AM} and 10 _{AM}	1 item; check time interval	Percent of subjects who checked different intervals
Bodily location where chest pain started and to where it radiated	2 items; the same 10 potential pain locations listed	Percent of subjects who checked different locations
Activity-related precipitants of chest pain	1 item; 8 potential activity precipitants listed	Percent of subjects who checked different precipitants
Chest pain sensory descriptors	1 item; 15 different pain descriptors listed	Percent of subjects who checked different descriptors
Physical activities that were “harder” or “could not be done” because of chest pain	2 items; the same 10 physical activities listed	Number of activities impaired by angina are summed; possible range for each item of 0–10 activities
“Emotional precipitants of chest pain” subscale	7 items; Likert scale with anchors, “not at all” to “quite a bit”	Sum of Likert ratings; possible range for subscale score of 0–28
Chest pain severity	1 item; Likert scale with anchors, “no pain” to “as painful as it could be”	Likert rating scale of 0–10 with higher score indicating greater severity
Upset because of chest pain or discomfort	1 item; Likert scale with anchors, “not at all upsetting” to “as upsetting as it could be”	Likert rating scale of 0–10 with higher score indicating greater upset
Worry about health because of chest pain	1 item; Likert scale with anchors, “not at all worried” to “as worried as I could be”	Likert rating scale of 0–10, with higher score indicating greater worry
“Chest pain relief measures” subscale	11 items; Likert scale with anchors, “no relief” to “complete pain relief”	Percent of subjects who indicated that they used each pain relief measure; sum of Likert ratings with possible range of 0–44, with higher scores indicating greater pain relief

Table II

Demographic and clinical characteristics (n = 27)

Characteristic	%	n
Sex		
Male	56.6	15
Female	44.4	12
Ethnicity		
Black	88.9	24
White or Asian	11.1	3
Marital status		
Married	37	10
Divorced/separated	37	10
Widowed	14.9	4
Single	11.1	3
Education		
9th grade or less	18.5	5
Attended some high school	18.5	5
High school graduate	40.7	11
Attended some college or college graduate	14.9	4
Trade school	7.4	2
Cardiac history		
AMI	59.3	16
CABG	7.4	2
PTCA	25.9	7

CABG, Coronary artery bypass grafting; *PTCA*, percutaneous transluminal coronary angioplasty.