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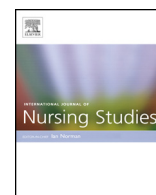**Alternative formats**: If you require this document in an alternative format, please contact: open.research@uwl.ac.uk

UPBEAT study patients' perceptions of the effect of coronary heart disease on their lives: A cross-sectional sub-study

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ABSTRACT

Background: Patients can report positive effects of myocardial infarction. It is unknown whether these effects are sustained or what factors influence adaptation.

Objectives: To explore primary care patients' perceptions of the effect of coronary heart disease and to identify possible modifiable predictors of adaptation.

Design and setting: Cross-sectional, sub-study of UPBEAT cohort participants. Patients were recruited from coronary heart disease Registers in South London General Practices.

Method: 548 participants were asked "Has having heart disease changed your life? If so, was that change for the better, worse, both or neither?" Participants were asked to explain their response; explanations were subjected to content analysis. Associations between response and lifestyle, demographic, mood and coronary heart disease variables were tested.

Results: Respondents (394 male, 72%) were aged 27–98 years and had had heart disease for a mean of 12.4 SD ± 8.4 years. 120 (22%) reported that life was better and 200 (37%) said it was worse. The explanations of those who said 'better' were categorised as 'Healthier Living', 'Recognised Mortality' and 'Stress Reduction'. For those saying 'worse', categories were 'Restricted Lifestyle', 'Recognised Mortality', 'Loss and Burden'. More anxiety symptoms (RRR 1.56, 95% CI 1.12, 2.17), lower functional status (RRR 2.46, 95% CI 1.21, 4.98) and self-reported chest pain (RRR 2.24, 95% CI 1.34, 3.77) were associated with saying 'worse'.

Conclusions: Many primary care patients are ambivalent to the effects of coronary heart disease, but some report positive effects. Negative perceptions are associated with reported functional impairment, chest pain and anxiety, but not illness severity or patient characteristics. Future work will track the implications of these perceptions, but nurses managing patients with coronary heart disease should consider these effects as they may be modifiable predictors of adaptation.

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What is already known about the topic?

- Patients can report positive effects in the immediate period post myocardial infarction.
- Individuals' perception of illness strongly influences their behavior.

What this paper adds

- Some primary care patients living with coronary heart disease report positive effects.
- Negative perceptions are not associated with illness severity or patient characteristics but by functional impairment, self-reported chest pain and anxiety.
- These effects may be modifiable predictors of adaptation which nurses, and other clinicians, should consider when managing patients with coronary heart disease.

1. Introduction

Patients may report positive as well as negative effects of myocardial infarction (Laerum et al., 1991; Petrie et al., 1999; Hassani et al., 2009). Positive illness perceptions in both myocardial infarction and breast cancer patients in one study (Petrie et al., 1999) were unrelated to objective measures of disease severity. Of interest to nurses and other clinicians helping to manage patients with coronary heart disease and other long term conditions is the relationship between illness perceptions and disease outcome or health behaviour. To explain this, Leventhal et al. have proposed the common-sense model of self-regulation (Leventhal et al., 2003). The common-sense model suggests that beliefs about illness have five dimensions: cause, identity, perceived control, severity of illness consequences and time line, and predicts that illness perceptions (*e.g.* perceived control of coronary heart disease or severity of its consequences) will influence emotional outcomes such as illness-related distress (Hagger and Orbell, 2003). Post myocardial infarction, the model has been used to explain attendance at cardiac rehabilitation, and an intervention which modified illness perceptions led to improved symptoms of angina and ability to return to work (Petrie et al., 1996, 2002; Cooper et al., 1999; Whitmarsh et al., 2003).

Positive illness perceptions or 'benefit finding' may be particularly important to understand due to the potential for patient benefit. A meta-analytic review of 77 studies in a range of conditions, showed that benefit finding was related to less depression and more positive well-being although it was also associated with more intrusive and avoidant thoughts about the stressor (Helgeson et al., 2006). In cardiac outpatients, self-reported angina was found to be related to future worse health related quality of life and more depression and in patients with type 2 diabetes and acute myocardial infarction, poor self-rated health predicted future cardiovascular events (Gravely-Witte et al., 2007; Venskutonyte et al., 2013). These studies have been conducted in patients soon after a cardiac event, however adjustment to disease may alter illness perceptions over time and the relationship between benefit finding and outcomes has been found to be affected by the amount of time passed since stressor onset (Helgeson et al., 2006).

Primary care registers enable access to patients who have both recent and longer established coronary heart disease. In the UK, general practitioners are incentivized under the Quality and Outcomes Framework (NHS Information Centre, 2009) to keep registers of patients with coronary heart disease, so that patients receive regular review. Most commonly, these reviews are conducted by practice nurses at the doctors' surgery. The primary aim of the UPBEAT (heart disease and depression) cohort study (NIHR RP-PG-0606-1048) is to monitor the relationship between coronary heart disease and depression over 4 years in patients recorded on General Practitioner coronary heart disease registers in practices in South London. As a sub-study of UPBEAT (Tylee et al., 2011), we aimed to explore participants' perceptions of the impact of coronary heart disease on their lives and to determine whether positive or negative perceptions are associated with lifestyle, demographic factors, depression, anxiety or heart disease status in order to identify potentially modifiable predictors of adaptation. This will inform the management of these patients, for which nurses are primarily responsible.

2. Methods

2.1. Participants

The UPBEAT cohort study methodology has been described in full (Tylee et al., 2011). Essentially, all patients currently on the coronary heart disease registers kept under Quality and Outcome Framework (NHS Information Centre, 2009) arrangements by 16 South London Primary Care Practices were invited to participate. Eight hundred and three were recruited and are assessed by telephone every six months over up to four years using validated self-report measures of health, mood and lifestyle which a research assistant reads out and then records the response. The UPBEAT cohort participants are heterogeneous in terms of time since coronary heart disease diagnosis, time since cardiac event (if they had an event), severity of disease and treatment received. To maximise the number of responses, to collect the data for this sub-study as efficiently as possible, and to ensure that responses were not affected by variation between participants in possible seasonal effects on mood, we set aside one month to complete this sub-study. All cohort participants who already had a follow up appointment scheduled during this month were contacted, regardless of the assessment point they had reached within the cohort. In this sub-study therefore, participants varied in the amount of time they had been enrolled on the UPBEAT cohort and the number of assessments they had previously completed. This sub-sample comprised 69% of the cohort sample so is likely to be representative of the entire cohort.

2.2. Perceived effect of coronary heart disease on life

At the end of their scheduled UPBEAT cohort study follow up assessment, participants of this sub-study were

asked: "Has having heart disease changed your life, if so, was that change for the better, worse, both or neither?" Patients answering 'better' or 'worse' were asked to give a reason for their response. The reasons given were recorded verbatim and transcribed onto an Excel spreadsheet (Microsoft, 2003).

2.3. Demography, lifestyle, mood and coronary heart disease status

At the UPBEAT cohort study baseline a comprehensive set of measures of demographic status, lifestyle, mood and coronary heart disease status had been recorded. These data were extracted from the full cohort dataset for the sample of participants of this sub-study. Baseline data were used to allow us to utilise the most complete set of variables available (not all measures were recorded at follow up assessments); the time from assessment of these variables to being asked the coronary heart disease impact question for this study therefore varied between sub-study participants who were at different stages of follow up for the main cohort; this was calculated for each participant. The following variables were available:

Demographic details: age, gender, ethnicity, employment status, relationship status and living arrangements.

Level of social deprivation, using the Index of Multiple Deprivation: a measure of multiple deprivation based on post code with increasing scores indicate increasing deprivation (Noble et al., 2007).

Lifestyle factors: smoking status (current, ex, never), alcohol consumption (yes/no), body mass index.

Mood: Depression and anxiety symptoms were measured using the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983); anxiety/depression caseness was assessed using the revised Clinical Interview Schedule (CISR) (Lewis et al., 1992) which identifies those meeting ICD-10 diagnositic criteria (World Health Organization, 1992). Coronary heart disease status: participant reported presence or absence of chest pain, using the modified Rose Angina Questionnaire (Rose, 1962); General Practitioner recorded diagnosis (myocardial infarction, ischaemic heart disease/angina or other); having received an intervention for coronary heart disease other than medication (*e.g.* stent) or not; number of years with coronary heart disease (date of first GP recorded coronary heart disease diagnosis); number of co-morbid long term conditions (all from GP notes); functional status (due to coronary heart disease and/or other co-morbidities), using the Specific Activity Schedule (SAS) (Goldman et al., 1981).

2.4. Analyses

The number of those responding 'better', 'worse' or 'both or neither' (classified as 'ambivalent') was recorded. Content analysis was used to explore verbatim responses elicited from those in the 'better' and 'worse' groups about how life had changed. One author (AS) coded these responses to identify themes. This analysis was agreed within the team which comprised a health psychologist and nurse (EAB), an academic General Practitioner (AT), a social scientist (AS) and a psychiatrist (AM).

Analysis of the quantitative data was conducted using Stata 11.2 (StataCorp, 2011). All statistical significance tests and confidence intervals were two-sided. A *p*-value of <0.05 was considered statistically significant. All confidence intervals (CI) were calculated at the 95% level. Categorical variables were summarised using proportions, continuous variables using means and standard deviations (SD). Chi-square tests (or Fisher's exact where expected cell frequencies were <5) were used to test univariable associations between categorical variables and outcome (better, worse or ambivalent response). ANOVAs were used to test for differences in means for continuous variables across outcome variable. Variables that had a statistically significant ($p < 0.05$) association with outcome were then included in a multinomial logistic regression model using the 'mlogit' command in order to determine predictors of outcome response.

Since this model was being developed for exploratory purposes all variables identified as significantly associated with outcome in the univariable analysis were included in the multivariable model. Variables that were no longer independently associated with outcome were removed from the model. However variables that showed a suggestion of significance in any of the comparisons (better *versus* worse, better *versus* ambivalent, worse *versus* ambivalent) were retained. The primary coronary heart disease diagnosis and whether there had been an intervention for coronary heart disease (taken from GP notes) were identified *a priori* as potential confounding factors so were investigated in the multivariable model. The impact of several time frames was also investigated within the model: (i) time from cohort baseline to date the impact question was asked; (ii) time from first GP coded coronary heart disease event and cohort baseline; (iii) and time from first GP coded coronary heart disease event to date the impact question was asked. Goodness of fit statistics (AIC and BIC) were compared for several models, the Hosmer–Lemeshow goodness-of-fit test was conducted and clinical judgement was used to decide upon the final model.

3. Results

All 548 participants (394 male) who were asked the coronary heart disease impact question responded. They were aged 27–98 years and had been living with coronary heart disease for a mean of 12.4 (SD8.4) years (range <1 month to 45 years); 239 reported current chest pain (44%). Other demographic and lifestyle variables, depression, anxiety (symptoms and caseness) and coronary heart disease status at the cohort study baseline are shown in Tables 1 and 2. The number of months from the cohort baseline to being asked the coronary heart disease impact question ranged from 6 to 36 months (mean 21.3, SD ± 7.1). One hundred and twenty participants (22%) reported that their life was better and two hundred (37%) said it was worse since having coronary heart disease. Two hundred and twenty-eight participants (42%) responded either 'both' or 'neither' ('ambivalent' group).

Table 1
Demographic and lifestyle variables at entry to UPBEAT cohort study.

	Mean (SD)
Age (*n* = 548)	70.5 (10.1)
IMD score (*n* = 548)	18.7 (14)
	N (%)
Gender	
Male	395 (72.1)
Female	153 (27.9)
Ethnicity	
White	496 (90.5)
Other	52 (9.5)
Employment	
Paid employment	101 (18.6)
Retired/Unemployed	426/17 (78.3/3.1)
Relationship status	
Married	371 (68.0)
Widowed	87 (15.9)
Separated/single	41/47 (7.5/8.6)
Living arrangements	
Spouse or partner/other	356/45 (65.2/8.2)
Alone	145 (26.6)
Smoking status	
Never	168 (30.7)
Ex	314 (57.3)
Current	66 (12.0)
Alcohol units/week	
None	144 (26.3)
1–10	266 (48.6)
11–20	80 (14.6)
Greater than 21	57 (10.4)
Drinks alcohol (n = 547)	
Yes	403 (73.7)
Body Mass Index	
Underweight or normal	124 (23.0)
Overweight/obese	254/161 (47.1/29.9)

Table 2
Mood and coronary heart disease status at UPBEAT cohort study baseline.

		Mean	SD
HADS depression score (*n* = 547)[a]		3.9	3.9
HADS anxiety score (*n* = 545)[a]		3.6	3.7
		N	**%**
CISR any depression (*n* = 548)	*Yes*	29	5.3
CISR any anxiety (*n* = 548)	*Yes*	57	10.4
GP coded coronary heart disease diagnosis (*n* = 548)	*Documented MI*	224	40.9
	IHD or angina/other	308/16	56.2/2.9
Received intervention (*n* = 548)	*Yes*	298	54.4
Number of co-morbidities (*n* = 548)	*0–1*	421	76.8
	2–5	127	23.2
SAS category[b] (*n* = 548)	*One/Two*	409	74.6
	Three/Four	139	25.4

[a] High score = worse mood.
[b] Specific Activity Scale: 1) Walk down a flight of stairs without stopping? 2) Carry anything up a flight of at least 8 stairs without stopping? 3) Carry 3 full bags of shopping up a flight of 8 stairs or more? 4) Take a shower without stopping?

3.1. Perceived effect of coronary heart disease on the lives of participants who said that life was either 'better' or 'worse' since having coronary heart disease

The responses made by those patients in the 'better' group could be categorised as (some patients made >1 response): 'Healthier Living' (*n* = 39) for example changed negative health behaviours, adopted healthier habits with recognition that this was beneficial; 'Recognised Mortality' (*n* = 52) for example increased awareness of control over their life and appreciation of it; and 'Stress Reduction' (*n* = 29) for example being calmer, working less. Responses from patients who said life was worse were categorised as: 'Restricted Lifestyle' (*n* = 107) for example avoiding certain activities, 'Recognised Mortality' (*n* = 53) for example fear of dying or having another cardiac event; and 'Loss and Burden' (*n* = 40) for example loss of employment and relationships.

3.2. Associations with demographic, lifestyle, mood and coronary heart disease status factors

Univariable analysis found statistically significant associations between outcome (viewing life as 'better',

'worse' or being ambivalent about this since having coronary heart disease) and gender, presence of chest pain, smoking status, alcohol consumption, functional status, age, social deprivation, depression and anxiety (symptoms and caseness) (Table 3). No statistically significant associations were found with any of the other measured variables ($p > 0.05$).

The variables for which there was a statistically significant association with outcome were included in a multinomial logistic regression model. Two clear contrasts were identified by this final model. The first contrast indicated differences between being ambivalent or giving a definite response (*i.e.* saying life was either better or worse). Participants were more likely to be ambivalent about how coronary heart disease had affected them (*i.e.* responding 'both' or 'neither' to the coronary heart disease impact question) if they were female (RRR 2.43, 95% CI 1.55, 3.81, $p < 0.001$), older (10 year increase, RRR 1.23, 95% CI 1.01, 1.50, $p = 0.043$), more deprived (SD increase 13.62, RRR 1.46, 95% CI 1.20, 1.78, $p < 0.001$), reported fewer depression symptoms (SD increase 3.87, RRR 0.61, 95% CI 0.47, 0.79, $p < 0.001$), drank no alcohol (drinks alcohol RRR 0.48, 95% CI 0.31, 0.76, $p = 0.002$) and did not have chest pain (chest pain present RRR 0.47, 95% CI 0.31, 0.71, $p < 0.001$).

The second contrast included variables that were significantly associated with saying life was worse *versus* better. Table 4 shows that three specific variables were significantly associated with a participant stating that coronary heart disease changed their life for the worse compared to changing their life for the better controlling for all other variables in the model. These were presence of chest pain, anxiety symptoms and lower functional status. Those with chest pain and lower functional status had over twice the relative risk of claiming coronary heart disease changed their life for the worse compared to the better;

Table 3
Statistically significant associations between viewing life as better, worse or being ambivalent since having coronary heart disease and measures of mood, demographic, lifestyle and coronary heart disease status.

	Better mean (SD)	Worse mean (SD)	Ambivalent mean (SD)	P value
Age	68.5 (10.2)	69.8 (10.2)	72.1 (9.7)	0.002
HADS depression	3.5 (3.4)	5.5 (4.3)	2.8 (3.2)	<0.001
HADS anxiety	2.7 (3.0)	5.1 (4.3)	2.8 (3.2)	<0.001
IMD score	16.3 (12.5)	13.8 (20.5)	20.5 (13.9)	0.017
	n (%)	**n (%)**	**n (%)**	
Gender				
Male	101 (25.6)	150 (38.0)	144 (36.5)	<0.001
Female	19 (12.4)	50 (32.7)	84 (55.9)	
CISR depression				
No	117 (22.5)	181 (34.9)	221 (42.6)	0.006
Yes	3 (10.3)	19 (65.5)	7 (24.1)	
Chest pain				
No	79 (25.6)	76 (24.6)	154 (49.8)	<0.001
Yes	41 (17.2)	124 (51.8)	74 (31.0)	
Smoking status				
Never	37 (22.0)	56 (33.3)	75 (44.6)	0.025
Ex	76 (24.2)	109 (34.7)	129 (41.1)	
Current	7 (10.6)	35 (53.0)	24 (36.7)	
Drinks alcohol				
No	20 (13.9)	47 (32.6)	77 (53.5)	0.002
Yes	99 (24.6)	153 (38.0)	151 (37.5)	
SAS[a]				
One/two	107 (26.2)	132 (32.3)	170 (41.6)	<0.001
Three/four	13 (9.4)	68 (48.9)	58 (41.7)	

[a] Specific Activity Scale: 1) Walk down a flight of stairs without stopping? 2) Carry anything up a flight of at least 8 stairs without stopping? 3) Carry 3 full bags of shopping up a flight of 8 stairs or more? 4) Take a shower without stopping?

and the relative risk for a one standard deviation increase in anxiety symptom score was associated with 1.5 times the risk of claiming coronary heart disease changed their life for the worse. The expected risk of claiming coronary heart disease has changed their life for the worse was therefore greater for those with chest pain, the least mobility and increased anxiety symptoms.

Table 4
Multinomial logistic regression model for whether coronary heart disease changed people's lives for the 'worse' compared to for the 'better' (n = 544).

		Worse v Better		
		RRR[a]	95% CI	P-value[*]
Sex	*Female*	1.12	0.60, 2.11	0.720
Age (10 year increase)		1.23	0.96, 1.57	0.100
IMD score (SD increase = 13.62)		0.94	0.72, 1.22	0.640
Chest pain	*Yes*	2.24	1.34, 3.77	0.002
Drinks alcohol	*Yes*	1.14	0.60, 2.16	0.690
HADS depression (SD increase = 3.87)		1.14	0.84, 1.55	0.389
HADS anxiety (SD increase = 3.72)		1.56	1.12, 2.17	0.008
SAS score	*Least mobile (3/4)*	2.46	1.21, 4.98	0.013

[a] Relative risk ratio.
[*] P-value is from the Wald test and tests the specific significance of the value presented.

4. Discussion

Over half the participants said that coronary heart disease had changed their life either for the better or worse. Those who said life was better and those who said it was worse reported greater recognition of their mortality and changing their health behaviour. However, for those who felt their life was worse, these changes were viewed negatively, whereas those who reported that their life was better viewed the same changes positively. Negative perceptions were associated with reported functional impairment, chest pain and anxiety symptoms, but not illness severity or patient characteristics.

We have shown that positive illness perceptions found in patients soon after experiencing a myocardial infarction, can also be found in those living with coronary heart disease in the community (Laerum et al., 1991; Petrie et al., 1999; Hassani et al., 2009). We also found that objective measures of illness severity, such as having had an intervention for coronary heart disease (*e.g.* insertion of a stent), General Practitioner recoded diagnosis and number of co-morbid physical conditions were not associated with perceptions of life being either better or worse since having coronary heart disease. This supports previous findings reporting positive experiences by patients hospitalized for myocardial infarction or breast cancer was unrelated to illness severity (Petrie et al., 1999).

Previous research highlighted the relationship between depression post myocardial infarction and poor quality of life (Gravely-Witte et al., 2007; Carney and Freedland, 2008). The negative impact of poor functional impairment on overall health can also be significant and has been reported several years post myocardial infarction (Schweikert et al., 2009). Our initial analyses indicated that being male, younger, less socially deprived, less depressed (as measured by both symptoms and caseness), having fewer anxiety symptoms, not having chest pain, not smoking, being active and drinking more were independently associated with reporting that life was better. The importance of cardiac risk factor management on a person's perceptions of well-being is supported by findings from the Euroaspire surveys (Smedt et al., 2013). The study revealed that cardiac patients who adopted a healthy lifestyle – smoking cessation, increasing physical activity, eating healthily – had better health related quality of life scores than those not making these changes. However, in our multivariable analysis, only self-reported functional impairment, anxiety symptoms and chest pain were significant: those with more anxiety symptoms, lower functional status and reporting chest pain at the cohort baseline were less likely to say life was better. These findings and those of the DIGAMI (Venskutonyte et al., 2013) study that low self-rated health predicts cardiac events, suggest that interventions which target subjective impacts of coronary heart disease may improve overall quality of life.

The study demonstrated that the perception of symptoms rather than objective illness severity was associated with overall perceptions of the effect of coronary heart disease and that having more anxiety symptoms is also important is predicted by the common-sense model

(Leventhal et al., 2003). We do not know whether the illness perceptions in this population are associated with their health behaviour, but in patients recently hospitalized for coronary heart disease greater symptom perception, as measured by the Illness perceptions questionnaire (which is based on the common-sense model), was one of the factors associated with attendance at cardiac rehabilitation (Leventhal et al., 2003; Whitmarsh et al., 2003; Broadbent et al., 2006).

5. Strengths and limitations

As well as examining positive *versus* negative perceived impact on life since having coronary heart disease, our model tested which variables were associated with making a definitive response (*i.e.* saying life was better or worse since having coronary heart disease) compared with being ambivalent about the impact of coronary heart disease. Almost half the participants were ambivalent and this kind of response was more likely if the participant was female, older, more socially deprived, less depressed, did not drink and had no current chest pain. However these findings are more difficult to interpret: whereas it is reasonable to consider the 'better' and 'worse' groups as homogeneous (in terms of their response 'life is better' *versus* 'life is worse' to the coronary heart disease impact question) this may not be the case for the 'ambiguous' group who were unable to be definitive and who may have responded 'neither better nor worse' or 'both better and worse'. These responses may represent indecision or no strong feels about coronary heart disease; it therefore does not seem reasonable to draw conclusions about these participants as a group.

A strength of this study is our use of a community sample, which enabled us to examine illness perceptions in participants who had been living with coronary heart disease from months to years, many of whom had multiple morbidity and therefore varied in how strongly they identified as a being a 'heart disease patient'. This was a 'new' population in contrast to previous research which focused on hospital patients and those recently discharged (Petrie et al., 2006; Cooper et al., 1999; Whitmarsh et al., 2003; Gravely-Witte et al., 2007; Venskutonyte et al., 2013). Future work could explore whether perceptions of the impact of coronary heart disease in these patients are associated with outcome variables such as adverse clinical events or proximal risk factors such as blood pressure.

A limitation is that the time interval between measurement of the dependent variables, time since coronary heart disease diagnosis and measurement of perceptions of the impact of coronary heart disease varied between patients. However, the amount of time between a diagnosis of coronary heart disease being recorded by their General Practitioner and the patient being asked the coronary heart disease impact question was not associated with response.

Our study did not find participant characteristics, including ethnicity, to predict illness perception, but it is notable that our sample was predominantly of self-reported white ethnicity (91%, Table 1). This is unlikely to reflect the ethnic profile of the patients registered at the practices from which we recruited, but is unsurprising given well established findings (Brown et al., 2014) that people from ethnic minority groups are less likely to take part in mental health research. Future research should consider potential barriers to recruitment from ethnic minority groups at the design stage (Brown et al., 2014).

Few of our participants reported a level of anxiety or depression sufficient for a diagnosis of disorder (10% and 5% respectively, Table 2). However, we found the greater the increase in self-reported anxiety symptoms the greater the increase in risk of claiming coronary heart disease changed life for the worse suggesting that findings would be similar in a clinically anxious population.

The cross-sectional study design with a single open-ended question was a feasible method of exploring perceptions of coronary heart disease impact and their relationship with other coronary heart disease and patient variables within an existing cohort study, but is also a limitation. Our future work will examine whether relationships are stable over time or whether they change in relation to changes in the other variables.

6. Conclusions

In patients living with coronary heart disease, negative perceptions of its effects are associated not with objective measures of illness severity or patient characteristics but by patient perceptions of functional impairment, chest pain and anxiety. Nurses and other clinicians managing patients living with coronary heart disease should consider these negative effects of the disease which may be modifiable predictors of adaptation to or outcome of coronary heart disease. Nurses may also wish to help patients to identify any perceived positive effects of having coronary heart disease as means of encouraging adaptation and emotional adjustment. The effects of this could be tested in research. Future work will track the implications of positive and negative perceptions of coronary heart disease impact on mood, quality of life, service use and coronary heart disease status over time.

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