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THE EFFECT OF HEART FAILURE NURSE CONSULTATIONS ON HEART FAILURE PATIENTS' ILLNESS BELIEFS, MOOD AND QUALITY OF LIFE OVER A 6 MONTH PERIOD.

ABSTRACT

Aims and Background: There is growing interest in patients' illness beliefs and the part they play in a patient's understanding of chronic disease.

Objectives: We wished to explore the effect contact with a heart failure nurse can have on patients' illness beliefs, mood and quality of life.

Design: Secondary analysis on two independent datasets. Patients were recruited from five UK hospitals, four in London and one in Sussex. Patients were recruited from an inpatient and outpatient setting. The first dataset recruited 174 patients with newly diagnosed with heart failure whilst the second dataset recruited 88 patients with an existing diagnosis of heart failure.

Methods: Patients completed the Minnesota Living with Heart Failure questionnaire, Hospital Anxiety and Depression scale, Illness Perception Questionnaire and the Treatment Representations Inventory at baseline and 6 months. We used a linear regression model to assess the association that contact with a heart failure nurse had on mood, illness beliefs and quality of life over a 6-month period.

Results: Patients who had contact with a heart failure nurse were more satisfied with their treatment and more likely to believe that their heart failure was treatable. Contact with a heart failure nurse did not make a statistically significant difference to mood or quality of life.

Conclusion: This study has shown that contact with a heart failure nurse can improve patient satisfaction with treatment decisions but has less influence on patient's beliefs about their personal control, treatment control and treatment concerns. With appropriate support, skills and training heart failure nurses could play an important role in addressing individual patient's beliefs. There is a need to further investigate this.

Relevance to clinical practice: Exploring patients' illness beliefs and mood could help to enhance person centred care. Heart failure nurses would need additional training in the techniques used.

Keywords: Illness beliefs, quality of life, heart failure nurse, anxiety, person centered care, heart failure.

What does this paper contribute to the wider global clinical community?

- Heart failure nurses can help to improve patient satisfaction with treatment decisions
- Illness beliefs are an important concept in chronic disease, however more research is required to explore the effect heart failure nurses have on patients' illness beliefs and to help identify approaches that can positively impact on beliefs.
- Heart failure nurses require training in the skills and techniques needed to provide person centred care.

INTRODUCTION

As the number of people living with a chronic disease increases, health care systems face two major challenges. The first is adapting healthcare systems and professional roles to ensure we can provide care for the growing number of patients. The second is endeavouring to improve on the patient experience and provide individualised care in a person centered way (Department of Health 2011).

The increasing number of patients living with chronic illness is a worldwide challenge. The number of people living with a chronic condition in Great Britain is estimated at 17.5million(Department of Health 2004; World Health Organsation 2011). Heart failure affects 1-2% of the population, or an estimated 50 million people, across Europe (McMurray et al. 2012; Cleland et al. 2002). Incidence increases with age and prevalence is expected to continue rising as the population ages alongside improvements in the treatment of acute cardiac disease. Patients with heart failure play a pivotal role in helping to manage their own condition (Department of Health 2002). Over the past decade this recommendation has been built upon and now features in many international heart failure guidelines (McMurray et al. 2012; National Institute for Health and Clinical Excellance 2010; Hunt et al. 2005). The European Society of Cardiology (ESC) guidelines define self-care as maintaining physical

stability, avoiding behaviours that may be detrimental to their health and being able to detect symptoms of deterioration (4). Both the ESC and the American Heart Association have published recommendations for improving self-care in heart failure (Lainscak et al. 2011; Riegel et al. 2009) and managing many of the barriers to effective self-care. These can be divided into three overarching themes: improving access to care; facilitating monitoring and management through a focus on patient education and addressing psychological issues; and support either from the healthcare provider or the patient's social network (Mead et al. 2010). However individual patients experience unique barriers to self-care. This highlights the importance of adopting a more person-centered approach to planning care. There is a growing interest in the importance of illness perceptions and beliefs as a driver for self-care and person-centred care.

BACKGROUND

Clinical nurse specialists work with a number of patient groups, both in acute and chronic care. In the United Kingdom (UK) heart failure nurse (HFN) posts have been introduced widely after they were found to reduce hospital admissions (Blue et al. 2001). The role was originally introduced largely to ensure patients had regular contact with a healthcare professional to detect early indicators of clinical deterioration and adjust and optimise medication appropriately. This role has evolved from providing protocol driven care to now requiring a combined approach of person-centered care together with evidence-based practice. Currently the work of a nurse specialist typically involves symptom control, assessing and meeting the information needs of patients, providing psychological support, acting as a key contact, coordinating complex care and helping to provide cost effective care (Royal College of Nursing 2010).

Adopting a person centered approach in hospitalised heart failure patients has been reported to reduce length of stay by two and half days without hindering the patient's ability to undertake activities of daily living (Ekman et al. 2011). Person centered care has been defined as care which a) explores the patient's main reason for their healthcare contact, their concerns, and need for information, b) seeks an integrated understanding of the patient's

world – that is their whole person - and includes their emotional needs and life issues, c) finds common ground on identifying the problem and mutually agrees on its management, d) enhances prevention and health promotion and e) enhances the continuing relationship between the patient and healthcare professional (Stewart 2001). Much of this literature focuses on the healthcare professionals view of person centered care, something that may differ between healthcare professional groups (Kitson et al. 2012). Ultimately however the individual patient should determine and be involved in what constitutes person centered care for them.

A recent systematic review of the literature on illness perceptions in patients with coronary heart disease reported that illness beliefs were associated with quality of life (QoL) and mood. The authors found that illness control, illness coherence and timeline of the illness were found to be important factors in patients who had suffered an unexpected myocardial infarction (Foxwell et al. 2013). Patients with heart failure have a high prevalence of anxiety, depression and a poor quality of life and this may effect their illness beliefs (Riley et al. 2012; Juenger et al. 2002). Understanding how healthcare professionals and processes can influence such beliefs is therefore important as a potential mechanism to alter beliefs and thereby influence behavior. A study in patients following a myocardial infarction who received a two-hour support session with a health psychologist reported a change in illness perceptions after three months. The session was individually tailored to the results of the Illness Perception Questionnaire (IPQ). Patients who received the intervention felt more prepared for leaving hospital and returned to work earlier (Broadbent et al. 2009).

In two UK studies we have previously reported how illness beliefs, mood and quality of life in patients with heart failure changed over time (Mulligan et al. 2012; Goodman et al. 2012). In a study of 174 patients newly diagnosed with heart failure we reported that patients' beliefs in the curability of their illness decreased over six months. However we also observed a statistically significant improvement in quality of life and a reduction in anxiety over this time period (Mulligan et al. 2012; Mehta et al. 2009). We have reported similar results in our study of patients with an existing diagnosis of heart failure who had been admitted to hospital

(Goodman et al. 2012). We observed a statistically significant improvement in physical functioning over six months but no change in emotional functioning or the proportion of people with probable anxiety or depression. Patients' beliefs that their medical or personal treatment could cure their heart failure decreased over time.

It is against this background that we designed this study to explore if routine contact with a heart failure nurse (HFN) influenced patients' beliefs about their illness and its treatment, quality of life and mood over the course of six months in these two observational studies.

METHODS

We performed secondary analysis on two independent datasets. The Hillingdon Hastings dataset recruited patients from two large general hospitals (Hillingdon Hospital in West London, UK and The Conquest Hospital, East Sussex, UK) (Mehta et al. 2009). All patients who received a first time diagnosis of heart failure between 2004 and 2005 on their attendance at an outpatient clinic or during hospital admission were eligible for the study. Heart failure was diagnosed according to contemporary European Society of Cardiology criteria (Remme and Swedberg 2001).

The second dataset was from the Garfield Weston study (Goodman et al. 2012). This study recruited patients with an established diagnosis of heart failure who were admitted to one of the three participating hospitals in West London, UK (Charing Cross hospital, Chelsea and Westminster hospital and the Royal Brompton hospital) between January 2009 and March 2010.

Both studies used a non-randomised within subjects repeated measures study design. Baseline and 6 month questionnaires in each dataset measured heart failure specific quality of life, using the Minnesota Living with Heart Failure questionnaire (MLWHF) (Rector et al. 1987) and anxiety and depression using the Hospital Anxiety and Depression Scale (HADS) (Zigmond & Snaith, 1983). The Hillingdon Hastings dataset used the original version of the Illness Perception Questionnaire (IPQ) to assess illness beliefs and the Garfield Weston

dataset used the revised version (IPQ-R) (Weinman et al. 1996; Moss-Morris et al. 2002). The Hillingdon Hastings study also assessed treatment beliefs using the Treatment Representations Inventory (TRI) (Hirani et al. 2008). We have analysed these datasets to assess the difference in illness beliefs and perceptions, QoL and mood between those patients that had routine follow-up by a HFN and those that did not.

All hospitals had established heart failure nurse services. The heart failure nurse optimised medication during outpatient follow-up and provided disease specific education regarding pharmacological and non-pharmacological treatments and disease processes. Telephone support to answer patient questions was available during normal working hours. During an inpatient hospital stay the heart failure nurse primarily provided disease specific education. Formal assessment of patient's self-care understanding or capability was not undertaken. The HFN had not received specific education or advice to focus on patient's illness or treatment beliefs

Minnesota Living with Heart Failure questionnaire (MLWHF).

Heart failure specific quality of life was measured with the Minnesota Living with Heart Failure questionnaire (Rector, et al. 1987). This uses a 6-point Likert scale to assess physical and emotional symptoms together with the impact of the illness on various aspects of daily living. The maximum score is 105 and higher scores suggest a poorer quality of life. The physical and emotional domains can be scored separately (Rector & Cohn 1992) .

Hospital Anxiety and Depression Scale (HADS)

The HADS is a 14- item scale; 7 questions measure anxiety and 7 questions measure depression (Zigmond & Snaith, 1983). Each item is scored on a four-point scale from 0 (not at all) to 3 (most of the time). The tool measures the patient's current 'state' of anxiety or depression rather than an existing 'trait'

Illness Perception Questionnaire (IPQ) and (IPQ-R)

Illness beliefs were measured using the original version of the Illness Perception Questionnaire (IPQ) (Weinman et al. 1996) and the revised version of the IPQ (IPQ-R) (Moss-Morris et al. 2002). The IPQ assesses illness perceptions on a 5-point Likert scale, looking at three different domains; control/cure, negative consequences and timeline of the illness. The IPQ-R assesses 8 domains: identity (not reported), timeline (acute/chronic), negative consequences, personal control, treatment control, illness coherence (not reported), timeline cyclical and emotional representations. Higher scores suggest greater beliefs in each domain.

Treatment Representations Inventory (TRI)

The cardiac treatment representation inventory (TRI) aims to understand individuals beliefs about their treatment (Hirani et al. 2008). It uses a 5-point Likert scale to assess patient's beliefs about the value of their treatment, treatment concerns, satisfaction with decisions regarding treatment and beliefs about the ability of their treatment to cure the illness. The mean score for each domain is taken with minimum score of 1 and a maximum score of 5. The lower the score the more satisfied the patient is, the more curable they believe the illness to be and the more value they believe the treatment to have. The lower the score the more concerns a patient has about their treatment.

Data analysis

Between group comparisons were undertaken using Chi-squared test or fishers exact test for categorical data. Paired t-tests were used to compare continuous data that were normally distributed. Wilcoxon signed rank tests were used as the non-parametric alternative. Baseline results indicated that there was a significant difference in gender in the Garfield Weston Study and assessment place in the Hillingdon and Hastings study. We performed linear regressions which included these variables in the model to correct for these differences when assessing effect of HFN on the dependent variables (table 1 and 2).

We undertook linear regression analyses to test the association between the six month scores on the MLwHF, IPQ and HAD questionnaires and our covariates (contact with a heart

failure nurse, differences in the groups at baseline and the baseline questionnaire scores). Significance was accepted at the 5% level ($p \leq 0.05$).

All data were analysed using IBM SPSS Statistics Version 20.

RESULTS

The baseline demographics for each dataset are shown in tables 1 and 2. The HFN had contact with just fewer than half of the patients in each study: 86 (49%) of the Hillingdon Hastings patients and 37 (42%) of the Garfield Weston group. In the Hillingdon Hastings study, the heart failure nurse saw a higher proportion of outpatients (63%) ($p=0.04$). In the Garfield Weston study the heart failure nurse saw a smaller proportion of all women in the study (6 (24%) $p=0.02$) (tables 1 and 2).

Health-related quality of life (physical and emotional)

Contact with a heart failure nurse was not associated with a statistically significant change in quality of life or mood. Results of the MLwHF questionnaire report that contact with a heart failure nurse was not associated with a statistically significant improvement in overall quality of life, physical functioning or emotional functioning between baseline and six months ($p > 0.05$ in all domains of MLwHF)(table 3).

Data from the Hospital Anxiety and Depression Questionnaire report that contact with a HFN made no statistically significant difference to the change in level of anxiety at six months in either dataset Hillingdon Hastings (co-efficient 0.74 [-0.42 to 0.57] $p=0.77$); Garfield Weston (co-efficient -0.13 [-1.30 to 1.3] $p=0.82$). There was no change in level of depression; Hillingdon Hastings (co-efficient -0.8 [-0.51 to 0.35] $p=0.71$); Garfield Weston (co-efficient 0.01 [-1.0 to 1.0] $p=0.99$) (table 3). Contact with a HFN also led to no significant change in patients' emotional reaction to their heart failure symptoms and its management when measured by the IPQ-R questionnaire (Garfield Weston dataset only (co-efficient 0.11 [-0.17 to 0.39] $p=0.44$).

Illness beliefs

Patients who had contact with the heart failure nurse had strong beliefs in the chronic nature of their heart failure over the six month period of the study, although this was not statistically significant (Hillingdon and Hastings (co-efficient 0.5 [-0.07 to 0.18] $p=0.43$, Garfield Weston co-efficient 0.56 [-0.12 to 0.23] $p = 0.53$). There was also no change in patients belief that their heart failure could be treated by medical management (treatment control: Garfield Weston dataset only (co-efficient -0.00 [-0.14 to 0.13] $p=0.97$) or by themselves (personal control: Garfield Weston dataset only (co-efficient 0.12 [-0.04 to 0.28] $p=0.13$).

Patients reported no change in their belief about the negative consequences of heart failure as a result of contact with a HFN: Hillingdon and Hastings (co-efficient 0.06 [-0.14 to 0.02] $p=0.17$): Garfield Weston (co-efficient - 0.00 [-0.15 to 0.14] $p= 0.96$) (table 3).

Treatment representations

These data were only collected in the Hillingdon and Hastings study.

At 6 months, patients who had contact with a HFN were significantly more likely to believe that their treatment could cure their heart failure (-0.09 [-0.17 to - 0.01] $p = 0.02$). They also had greater satisfaction in the decisions made about their treatment ($p= 0.01$) (table 3).

There was no change in patient's beliefs about the value of their heart failure treatment (co-efficient -0.35 [-0.10 to -0.03] $p=0.32$). Patients had more concerns about their treatment at 6 months but this was not statistically significant (co-efficient -0.03 [-0.13 to 0.7] $p= 0.07$) (table 3).

DISCUSSION

We have explored the effect contact with a heart failure nurse has on a patient's mood, QoL and illness beliefs in two observational datasets. In these studies 49% and 42% of the Hillingdon and Hastings group and the Garfield Weston group had contact with a heart failure nurse respectively. There was no difference in the age or proportion of patients with severe heart failure between those that had contact with a HFN and those that didn't. Overall these data do not report a statistically significant difference in quality of life or mood in patients followed up by a heart failure nurse.

In this analysis we found that contact with a heart failure nurse made no difference to levels of anxiety or depression at 6 months. Previous studies have reported high levels of anxiety and depression in patients with heart failure (Riley et al. 2012; Juenger et al. 2002). Patients with depression have been shown to have poorer outcomes (Jiang et al. 2001) and low mood has been shown to reduce quality of life (Hallas et al. 2011). Depression is common and affects a number of other aspects of patients' wellbeing. In a qualitative study it has been reported that HFN rarely explored patients' goals and priorities and tended to adopt a protocol driven approach that offered standard advice (Sanders, Harrison, and Checkland 2010). To positively impact on patients mood heart failure nurses may have to adapt their approach to each individual. Specific motivational interviewing techniques have been shown to improve quality of life and self-care and may have a positive effect on mood (Riegel et al. 2006; Brodie et al. 2008), however these practices are not routinely used in the UK. Such techniques draw on the skills and theories used in counseling and would require heart failure nurses to receive specific training in such techniques. For nurses to make changes towards a more person centred approach they need to identify and discuss patients' concerns, misconceptions and mood. This may require additional training and support to that provided in current undergraduate education programmes in the UK (Brodie et al, 2008; Ekman et al. 2011).

We found that patients understood their illness to be more chronic in nature at 6 months and the treatment representation inventory questionnaire indicated that interaction with the heart failure nurse helped patients to understand the progressive nature of heart failure. Being realistic about the nature and prognosis of illness is a key component of the person centred approach as it enables patients to make informed choices about their care and treatment (Kitson et al. 2012). These findings suggest that the informational aspects of contact with the nurse have a distinct effect on patients' understanding of their heart failure and are an important aspect of the heart failure nurse role.

Whilst patients understand the chronic nature of heart failure the IPQ-R results indicate that over time patients felt they had less personal and treatment control. A diminishing sense of

personal control and treatment control could be an area that HFN could work with patients in trying to reestablish a sense of empowerment. This area would also require some specific training as the techniques necessary to assist patients to develop an increased sense of control or self-efficacy is a difficult task.

Interestingly, although patients had less belief in the ability of their treatment to control their symptoms at 6 months, our data suggest that patients had a better understanding of the negative consequences of heart failure. As patients adapt to home life following a hospital admission with heart failure they learn more about the consequences of their illness through daily life, trial and error (Kralik et al. 2004). Recent qualitative work suggested that the more challenging consequences patients had to adapt to were often physical and social (MacInnes 2013). These are likely to have a greater impact on a patient's quality of life and ability to maintain independence, possibly affecting their mood.

We report a significant improvement in patient satisfaction with treatment decisions. Patients who had contact with a heart failure nurse were more satisfied with the treatment decisions that had been made and more likely to understand that heart failure is treatable. One explanation for increased patient satisfaction with treatment decisions is that patients are able to maintain a link with specialists, whilst an inpatient or an outpatient. Access to a key healthcare professional for support and continuity of care is a key factor associated with patient satisfaction and self-care (Bergeson & Dean 2012). However this relies on a relationship of mutual trust between patient and healthcare professional and this usually only develops over time (McWilliam & Freeman 2007). A recent study looking at the effect of individualised care on patients' uncertainty of their illness and its treatment reported a significant improvement in patients' understanding of the complexities of heart failure and its management (Dudas et al. 2013).

A large multicentre randomised controlled trial (COACH study) challenges the assumption that increased time is always translated into improved patient outcomes (Jaarsma and van Veldhuisen 2008). In this study offering either moderate or intensive nurse led disease

programmes together with optimal clinical care had no effect on the outcomes of death or hospitalisation. The political emphasis, certainly in the UK, has been towards improving the delivery of compassionate care that focuses on the needs of the individual (Francis) and this same emphasis is now promoted in clinical research also (Calvert et al. 2013). Such changes stress the importance for care to have more emphasis on quality, focusing on achieving patients' individual goals, rather than the quantity of care. A sub-study of the COACH study looking at patients' perspectives of heart failure nurse led interventions reported that patients were satisfied with care whether they had received intensive or basic support (Hoekstra et al. 2010). To provide an individualised level of person centred care there needs to be an appropriate level of nursing staff with suitable knowledge, support and training.

LIMITATIONS

This is a non-randomised observational study and the hospitals involved had well established heart failure services. The results therefore may not be generalisable to other populations and hospitals. Due to the nature of the study it is difficult to determine what contact with a heart failure nurse involved and it is likely to have varied at different hospitals. It is not possible to clarify how many visits patients had with heart failure nurses and what this contact involved is likely to have varied in different hospitals. This makes it difficult to determine if the frequency of contact influenced the large number of non-significant findings.

RELEVANCE TO CLINICAL PRACTICE.

There is a growing interest in the role that patients' illness beliefs play in chronic disease. Currently there is limited work exploring the effect that health care professionals have on illness beliefs within heart failure. Understanding patients' individual illness beliefs, anxieties and limitations on quality of life can help us to deliver improved person centred care. This study has highlighted that heart failure nurses can enhance patient satisfaction but more research is needed to determine ways illness beliefs and mood can be positively influenced. The notion that a deeper understanding of illness beliefs could help provide improved person centred care may also be applicable to other areas of chronic disease. It has also

emphasised that as healthcare professionals adapt their approach to deliver more person centred care, encompassing different techniques, further training may need to be included in undergraduate and as postgraduate training.

CONCLUSIONS

This study explored the effect that having contact with a heart failure nurse had on illness beliefs, mood and quality of life. These data have shown that contact with a heart failure nurse improved patients' satisfaction with treatment decisions and helped patients to maintain a view of the progressive nature of heart failure. Over time patients lose a sense of personal control and control over their treatment as they adapt to living with the consequences of heart failure.

More research is needed in this area to enable us to have a deeper understanding of the HFN role in addressing patients' illness beliefs, mood and quality of life. This analysis has highlighted the importance of exploring patients' illness beliefs and how the HFN could play an important part in helping patients to develop a better understanding of their heart failure. The findings suggest that the nurse primarily had an informational role, which provided the patient with additional understanding of their illness and its management. However the HFN is in an ideal position to assess and help address individual concerns. As specialist-nursing roles in all disease areas adapt and develop to take on a more 'whole person' approach then the HFN requires additional education and support to deliver person centred care and to address patient individual concerns. More research is needed in this area.

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Table 1: The baseline characteristics of the Hillingdon Hastings dataset showing the group that saw a heart failure nurse (HFNS) and the group that did not (No HFNS).

		HFNS (86) N (%)	No HFNS (88) N (%)	P-value
Age	(Mean and SD)	70.4 (11.3)	72.5 (10.9)	0.21 ^a
Gender	Female	26 (30.2)	32 (36.4)	0.39 ^a
	Male	60 (69.8)	56 (63.6)	
Assessment place	Inpatient	59 (45)	72 (55)	0.04 ^{*a}
	Outpatient	27 (63)	16 (37)	
NYHA	2	11 (12.8)	8 (9.1)	0.58 ^a
	3	36 (41.9)	34 (38.6)	
	4	39 (45.3)	46 (52.3)	
Number of co-morbidities	0	55 (64.0)	51 (58.0)	0.65 ^b
	1	27 (31.4)	31 (35.2)	
	≥2	4 (4.7)	6 (6.8)	
	Angina	17 (19.8)	14 (15.9)	0.53 ^a
	MI	22 (25.6)	34 (38.6)	0.07 ^a
	CABG	7 (8.1)	5 (5.7)	0.52 ^a
	PCI	3 (3.5)	8 (9.1)	0.13 ^a
	Hypertension	39 (45.3)	45 (51.1)	0.45 ^a
	Diabetes	15 (17.4)	17 (19.3)	0.75 ^a
	AF	22 (25.6)	22 (25.0)	0.93 ^a
	Stroke	8 (9.3)	8 (9.1)	0.96 ^a
	Pacemaker	4 (4.7)	3 (3.4)	0.72 ^b
	Dyslipidaemia	21 (24.4)	28 (31.8)	0.28 ^a
	COPD	14 (16.3)	14 (15.9)	0.95 ^a

^a: P-value from Chi Squared test ^b: P-value from Fisher exact test

Key: MI – Myocardial infarction NYHA – New York heart association, CABG – Coronary artery bypass grafts, PCI – Percutaneous coronary intervention, AF – Atrial fibrillation, COPD - Chronic obstructive pulmonary disease

Table 2: The baseline characteristics of the Garfield Weston dataset showing the differences between the group that saw a heart failure nurse (HFNS) and the group that did not (No HFNS).

		HFNS (37) N (%)	No HFNS (51) N (%)	P-value
Age	(Mean and SD)	70.6 (12.3)	70.4 (13.2)	0.92 ^a
Gender	Female	6 (24)	19 (76)	0.02 ^a
	Male	31 (50)	31 (50)	
NYHA	1	1 (3)	3 (6)	0.73 ^b
	2	18 (49)	18 (35)	
	3	10 (27)	15 (29)	
	4	1 (3)	3 (6)	
	MI	7 (19)	11 (22)	0.50 ^a
	CABG	5 (14)	11 (22)	0.18 ^a
	Hypertension	12 (32)	10 (20)	0.29 ^a
	Diabetes	12 (32)	11 (22)	0.44 ^a
	AF	15 (37)	19 (41)	0.92 ^a
	Stroke	3 (8)	4 (8)	1.00 ^b
	Pacemaker	5 (13)	3 (6)	0.32 ^a
	COPD	5 (13)	3 (6)	0.29 ^b

^a: P-value from Chi Squared test ^b: P-value from fishers exact testing

Key: MI – Myocardial infarction, NYHA – New York heart association, CABG – Coronary artery bypass grafts, PCI – Percutaneous coronary intervention, AF – Atrial fibrillation, COPD - Chronic obstructive pulmonary disease

Table 3: Linear regression analysis of the effect of contact with a heart failure nurse on illness beliefs, mood and quality of life at 6 months.

		Hillingdon and Hastings dataset			Garfield Weston dataset		
		Co-efficient	Confidence interval	P-value	Co-efficient	Confidence interval	P-value
Minnesota living with heart failure	Total score	-0.42	-3.4 to 2.5	0.78	1.79	-3.9 to 7.4	0.54
	Physical score	-0.70	-2.3 to 0.86	0.38	0.22	-2.5 to 2.9	0.90
	Emotional score	0.16	-0.67 to 0.99	0.70	0.89	-0.80 to 2.6	0.30
Hospital anxiety and depression score	Anxiety	0.74	-0.42 to 0.57	0.77	-0.13	-1.30 to 1.03	0.82
	Depression	-0.8	-0.51 to 0.35	0.71	0.01	-1.03 to 1.05	0.99
Illness Perception questionnaire	Cure	0.00	-0.06 to 0.07	0.88	N/A	N/A	N/A
	Negative Consequences	-0.06	-0.14 to 0.02	0.17	-0.00	-0.15 to 0.14	0.96
	Timeline	0.50	-0.07 to 0.18	0.43	0.56	-0.12 to 0.23	0.53
	Timeline Cyclical	N/A	N/A	N/A	0.12	-0.68 to 0.30	0.21
	Emotional representations	N/A	N/A	N/A	0.11	-0.17 to 0.39	0.44
	Personal Control	N/A	N/A	N/A	0.12	-0.04 to 0.28	0.13
	Treatment control	N/A	N/A	N/A	-0.00	-0.14 to 0.13	0.97
Treatment representations inventory	Treatment Concern	-0.03	-0.13 to 0.70	0.07	N/A	N/A	N/A
	Treatment Satisfaction	-0.81	-0.15 to -0.17	0.01	N/A	N/A	N/A
	Treatment Cure	-0.09	-0.17 to -0.01	0.02	N/A	N/A	N/A
	Treatment Value	-0.35	-0.10 to 0.03	0.32	N/A	N/A	N/A