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TITLE: Personalised discharge care planning for post myocardial infarction patients through the use of the Personalised Patient Education Protocol - implementing theory into practice.

ABSTRACT

Aims and Objectives

This study aims to evaluate the service impact of the integration of an evidence-based instrument - the Personalised Patient Education Protocol (PPEP) - into an existing post myocardial infarction care pathway.

Background

Recent research indicates that while better patient health outcomes can be achieved when care planning is personalised, delivery staff feel less satisfied and less confident in its provision. To achieve a shift to personalised care, innovations are needed to enable an effective transition for staff.

Design

A service evaluation using a patient survey and nurse interviews.

Method

A longitudinal patient survey measured changes in patient illness beliefs, cardiac diet and exercise self-efficacy, anxiety, depression and quality of life study of a patient cohort of 74. Paired t-tests analysed the effects before and after the implementation of the PPEP. CR nurses who implemented the PPEP were interviewed and a patient survey identified perceptions of the usefulness of the service innovation.

Results

Analysis of change from baseline to three months results showed statistically significant changes in Illness Belief component 'Understanding' and the Dartmouth Quality of Life 'General Health'. The integration of the PPEP into the existing

discharge process identified service improvements for cardiac nurse training and care pathway delivery, while patients identified the level and frequency of their use of the protocol following discharge.

Conclusion

The introduction of the PPEP succeeded in increasing patient engagement, facilitated a more patient-centred service by enabling practitioners to systematically provide personalised patient education, and gave patients a post-discharge structure to better follow-up their illness concerns with health professionals in the community.

Relevance to Clinical Practice

Integration of the PPEP into an existing post myocardial infarction care pathway enabled nurses to systematically respond to individual patients' illness beliefs and expectations.

KEY WORDS: Patient voice, Patient participation, Patient-centred care.

INTRODUCTION

Current research promotes personalised care planning to provide effective patient care, leading to better patient health outcomes. A recent Cochrane Review found that the effects on patient health outcomes are greater when personalised care planning with follow-up support is integrated into routine care (Coulter *et al.* 2015). The King's Fund report (Coulter *et al.* 2013) described a co-ordinated service delivery model - 'the house of care' - and promotes this as the way to deliver better services for people with long-term conditions. The report stated that 'health care professionals need to abandon the traditional ways of thinking and behaving, where they see themselves as the primary decision-makers and, instead, shift to a partnership model in which patients play an active part in determining their own care and support needs' (Coulter *et al.* 2013). In this context the paper aims to explore the implications for practitioners and the organisation of healthcare services of the introduction of one novel intervention designed to increase patient engagement in their care planning.

BACKGROUND

National and international guidelines in cardiac care recommend that a personalised care approach in cardiac rehabilitation (CR) for patients after the diagnosis of myocardial infarction (MI) should be adopted to promote 'good health' and 'prevent re-occurrence' (The British Association of Cardiovascular Prevention and Rehabilitation (BACPR) 2012, Department of Health (DOH) 2013, National Institute of Health and Care Excellence (NICE) Commissioning Guides 2013). While there are some individual models achieving successful outcomes in preventative cardiac

health (Connolly *et al.* 2011, Wood *et al.* 2008), the delivery of cardiac rehabilitation to promote self-care management is complex. Healthcare practitioners are required to provide health education and strategies to support individuals managing behaviour such as diet, exercise, smoking and lifestyle changes. Much work and development is still needed to promote patients' self-care management to sustain life-long behaviour change and healthy psychosocial adjustment to their cardiac condition.

For a patient to make sense of an illness is a complex process of cognition, emotion and appraisal which can change any number of times during/after an admission and be influenced by any number of factors, both internal and external to an individual (Leventhal *et al.* 1984, Diefenback & Leventhal 1996, Lazarus *et al.* 1984). In-hospital anxiety (Roest *et al.* 2010), depression (Lane *et al.* 2002, Frasure-Smith *et al.* 1995), hostility (Lavie & Milani 2006), fatigue (Alsen & Brink 2013), hopelessness (Dunn *et al.* 2006), and post-traumatic stress or distress (Edmondson & Cohen 2013) have all been documented as significant factors in reduced coping/adjustment, poorer quality of life and reduced uptake and adherence to secondary prevention services. These factors also have a significant impact on morbidity, mortality and over-utilisation of health services after an MI.

If this complex process is not to be a barrier to effective care there needs to be an integration of physical and mental health approaches to patient care which engages patients to personalise their care. For MI patients cardiac rehabilitation nurses can play a vital role in integrating physical and mental healthcare as long as they have the right tools for the task and understand how to engage patients in the creation of appropriate care to which patients can positively relate and respond.

A recent systematic review demonstrated that while patients' value, and are more satisfied by, personalised models of health care delivery, staff feel less satisfied and less confident in its provision (McMillan *et al.* 2013). This would suggest that if personalised healthcare is to become more widespread staff's confidence and satisfaction with this approach needs to be supported. Progress in overcoming this barrier is made difficult by the lack of evidence as to what works best, who should deliver it, and what the component parts should consist of, when considering personalised interventions (Dwamena *et al.* 2012). With MI patients CR nurses need to have the appropriate tools and training to enable them to facilitate patient engagement in their own care planning. An assessment tool which provides structure to capture and assess individual patient constructs of their illness and their potential for recovery could address the difficulty of providing effective personalised care.

The development of in-hospital assessment tools alone is not the sole answer to the development of self-care management of MI patients. Research on older patients (Shepperd *et al.* 2013) indicates that an individually tailored discharge plan is also helpful to reduce the length of hospital stay and readmission. Shepperd *et al.* (2013) concluded that interventions provided across the 'hospital-municipal interface' - both in hospital and in the patient's home - showed the largest effect. Protocols which focussed on the patients' journey through and out of hospital into the community were more likely to have a beneficial effect than an in-hospital focus. For this reason the development of an assessment tool needs to have a wider application to the patients' care pathway than simply their hospital discharge. The development of the Personalised Patient Education Protocol sought to address these issues by integrating into existing discharge procedures an assessment tool using research-

based evidence to engage and structure personalised health education and care self-management both in hospital and after discharge (Lau-Walker 2014).

Design of the Personalised Patient Educational Protocol (PPEP)

The PPEP was designed to facilitate systematic nurse-patient interaction to clarify patients' interpretation of health promotion advice and strengthen their capacity to manage suggested health behaviour and lifestyle changes. The design is based on the Interactive Care Model (Lau-Walker 2006) which emphasised that by responding directly to the reactions and perceptions of patients', healthcare professionals will create more opportunities to make relevant interventions and support patients' self-management of their cardiac risk factors. Hence, the PPEP is structured to engage both the patient and the CR nurse in the systematic assessment of the individual patient's illness beliefs and expectations to focus healthcare professionals on the issues important to the patient.

The PPEP has two components: an Illness Belief Protocol (IBP) and a Self-Management Protocol (SMP). The IBP is designed for use with nurses pre-discharge. It requires patients to articulate their illness beliefs so that nurses can respond directly to their patient's perceptions and tailor discussion about health behaviour change and management of their individual cardiac risk factors. The SMP is designed to get patients to adopt a problem solving approach to the management of their symptoms. This structure prepares patients to be more confident to discuss their experience and concerns with doctors and nurses after discharge.

Cardiac patients groups, cardiac rehabilitation staff - cardiologists, cardiac rehabilitation nurses, health psychologists - and physiotherapists from three London hospitals were involved in the development of the PPEP. Cardiac patients and healthcare professionals revised the timing and practicality of the delivery of the PPEP to ensure information was delivered in a consistent, concise, and clear manner without the patient getting information overload. A brief summary of the PPEP Training Manual and PPEP Patient Workbook which support the IBP and SMP respectively, was published as an innovation practice in Nursing Times (Lau-Walker 2014) and the details of the PPEP Training Manual and PPEP Patient Workbook can be found at (Insert link).

Implementing the service innovation

The current study reports the evaluation of the delivery of the PPEP in one south east London hospital and the impact it had on the patients and the implications for service delivery. The evaluation is based on the results of a patient longitudinal study, a patient questionnaire on their use of the PPEP following discharge, and interviews with the nurses implementing the innovation within the discharge procedure.

Hospital management governance approval was gained for the use of an evidence-based tool to structure personalisation of health education for MI patients prior to discharge. Detailed discussion on the implementation of this innovation was held with hospital consultant cardiologists, the head of cardiovascular nursing and the head of CR nursing, and support gained from the Local Clinical Academic Group. A full application of the implementation of the PPEP as a service evaluation secured

full approval from the local Research & Development Department and implementation began with a pilot in August/September 2013.

The CR nurses who normally carry out the discharge planning and advice to MI patients helped to integrate the PPEP materials into the existing discharge procedure. This reduced duplication of information, adopted a consistent format to existing hospital discharge planning materials, and identified where and when within the care pathway to deliver the PPEP. These nurses received training in the use of the PPEP. During a two month pilot they practiced delivery of the PPEP tools with patients prior to their hospital discharge and were debriefed by the researcher to receive further clarification of the tool and its use. As a result of the pilot, minor wording changes were made to the intervention tools, patient workbook and instructions. The CR nurses were asked to keep notes of what worked and what did not during the full implementation phase.

Measures used in the longitudinal study

Changes in the patients' illness beliefs, their self-efficacy for cardiac diet and exercise, anxiety and depression and quality of life were measured, using validated measures, before discharge and repeated at three months following discharge. The follow-up questionnaire at 3 months included additional questions about patients' perceptions of the usefulness of the PPEP following discharge. At the end of the patient data gathering the nurses were interviewed and their responses were fed into the service evaluation.

The measures used in the study have proven validity and reliability and measure the following:

1. Emotional state: The Hospital Anxiety and Depression Scale (HADS) was used to measure psychological wellbeing with two components of 'anxiety' and 'depression' (Zigmond & Snaith 1983).
2. Quality of life: The Dartmouth COOP Quality of Life Questionnaire (Dartmouth QoL) was used to assess patients' perceived quality of life across three dimensions of physical, psychological and social adjustment to illness. It includes three subscales: 'General Function', 'General Health' and 'Quality of Life' and has demonstrated reliability and is quick and easy for patients to use when compared to other general health questionnaires (Nelson *et al.* 1990).
3. Physical exercise: The Total Activity Measure (TAM) was used to assess patients' self-reported strength (ie 'strenuous', 'moderate' and 'mild') and length (minutes) of physical activities/exercise (Godin & Shephard 1985, Orrell *et al.* 2007).
4. Self-efficacy: The Cardiac Diet Self-Efficacy Instrument (CDSEI) and Cardiac Exercise Self-Efficacy Instrument (CESEI) were used to measure a patient's belief in their ability to cope with behaviour changes in diet or exercises respectively after a cardiac event. They have a high internal consistency with alpha coefficients of 0.9 (Hickey *et al.* 1992).
5. Illness belief: The Brief Illness Perception Questionnaire (BIPQ) (Broadbent *et al.* 2006) developed to provide a quantitative assessment of the illness perception components described in Leventhal's Self-regulatory Model (Leventhal *et al.* 1984). The 8 BIPQ components: 'consequence' (illness effect on their life), 'timeline' (length of illness), 'personal control' (feel in control), 'treatment control' (treatment can help illness), 'identity' (experience of symptoms), 'concern' (concern of illness),

'understanding' (understanding of illness) and 'emotions' (affected emotionally) were used to assess patient's perception of their illness.

Participants

The participants of this service evaluation were patients who were admitted to the Heart Attack Centre (HAC) at the south east London hospital with a confirmed diagnosis of MI between November 2013 and March 2014. For the purpose of this study they were invited to participate in the longitudinal patient survey, as long as they were 18 or above, and did not have persistent cardiogenic shock post PPCI or cognitive impairment/dementia which would prevent meaningful participation in the discussion of illness perception and symptom management. Patients with sight impairment received additional assistance in completing the questionnaire.

Data collection

Consecutive patients who presented to the Heart Attack Centre (HAC) at the South East London Hospital with a confirmed diagnosis of MI were invited to participate in the longitudinal survey before hospital discharge and as soon as their condition was stable. Informed consent was obtained by CR nurses using a patient information sheet which contained the relevant information about the service evaluation and an explanation about the voluntary nature of the service evaluation. The information sheet stated clearly patients would be asked to complete two questionnaires - before hospital discharge and again at 3 months – and a few questions about their view of the use of the PPEP. This request would be in addition to the completion of the National Audit of Cardiac Rehabilitation (NACR) which the hospital has used with patients for the last four years to inform commissioning, clinical guidance and CR service development. The confidential nature of the data management was also

emphasised and that all participant data were anonymised to unique identification numbers kept in a password-controlled database and accessed only by the nominated service evaluation team members.

Patients completed the first set of questionnaires once their condition was stable and the CR nurses visited patients prior to their hospital discharge. Based on the patient's completed questionnaire about their illness beliefs and expectation, the CR nurses discussed and helped patients to make linkages between their individual illness beliefs and the specific recommended health behaviour changes to manage their cardiac risk factors. The CR nurses explained the purpose of the PPEP workbook and provided patients with their individual copies, and reminded patients that they would be asked to complete the follow-up questionnaire three months later.

Data Analysis

Prior to statistical testing all summary score variables (IBQ, HAD, Self-Efficacy, TAM and Dartmouth QoL) were assessed for normality. The change in variable score, from baseline to three month, was tested statistically using the paired t-test. If skewness or kurtosis for the change variable (baseline minus three month) exceeded ± 2 then the bootstrap probability ($Pr > t$) and bootstrap 95% confidence intervals were calculated and presented in table 2 (Hildebrand 1986). All confidence intervals and probability values were adjusted for multiple comparisons using the Bonferroni correction method (α [5% level] = $0.05/21 = 0.0024$). All TAM summary variables, except for 'Strenuous frequency', and Dartmouth 'Quality of Life' had skewness and/or kurtosis outside the acceptable range. The bootstrap probabilities for these

variables were similar to those for the paired t-test and conclusions remained the same. All analyses were conducted using IBM SPSS version 22 (IBM Corp. 2013).

Interviews with CR nurses

The CR nurses normally responsible for carry out discharge care planning with MI patients during the PPEP delivery period were asked to keep notes of the positives and negatives of the use of the PPEP. At the end of the service review period structured interviews were carried out with each individual nurse to identify issues that had arisen from their experience of the implementation, asking them to describe both the 'positives' and 'negatives' for the service of the use of PPEP to April 2014. The structured interviews were guided by the three questions:

- (1) Having used the PPEP, what positive aspects can you identify;
- (2) Having used the PPEP, what negative aspects can you identify; and
- (3) Do you have any recommendations to help implement the PPEP in the future.

RESULTS

Descriptive statistics were used to describe demographic and illness characteristics of the participants. Seventy four patients were enrolled in this service innovation initially and the mean age was 58 (SD±12), 78.4% male, 63.5% with partners, 21.6% live on their own and 58.1% in employment. The follow-up measures at three months were completed by 50 patients (Table 3). SPSS (version 20) was used to carry out the data analysis.

Insert Table 1

Results on patients' illness beliefs, self-efficacy (for diet & exercise), emotional states (anxiety & depression) and quality of life:

Paired t-tests were used to establish any significant differences in patients' self-report responses in their illness beliefs, exercise, diet, stress and anxiety and quality of life.

Insert Table 2

Illness Belief component 'illness coherence' ($p=0.021$) demonstrated a statistically significant change at three months suggesting that patients had a better understanding of the illness condition. The seven other illness belief components did not change significantly. No significant changes were reported in the HAD subscales for anxiety and depression or for self-efficacy of exercise and diet. The latter shows that patients had not improved their confidence in their exercise or diet. TAM measures did change significantly between baseline and three months.

Patients reported a significant improvement in their 'Dartmouth Quality of Life 'General Health' ($p=0.041$) whilst there was no significant change in 'General function' or 'Quality of Life'.

Results on patient responses to the use of the PPEP Patient Discharge Workbook:

In addition to the validated measures, a number of open questions were added to the second questionnaire pack sent at 3 months to evaluate patients' response to the use of the PPEP Patient Workbook. Thirty one out of the 51 patients at three month (59%) indicate that they have found the PPEP Patient Workbook useful and scored

the PPEP 7(SD±2.42) on a scale of 1-10 being helpful. Patients also reported that they had used the workbook to prepare for 'GP appointment'- 31%, 'Hospital consultation'- 29%, 'CR nurse appointment'- 20% and 'telephone consultation'- 2%.

Insert Table 3

Key points identified in the interviews with CR nurses:

- To handle an increased patient participation: 'patients asked more questions' the PPEP provided a structure for patients to express their views and to ask more questions.
- To deliver the PPEP they had to adopt a more facilitative style: 'listen to patients more' and 'the structure of the PPEP tools enables me to adopt a facilitative approach'.
- to identify new learning: 'surprised to hear that some patients think that they have been cured after the angioplasty (stent) procedure'.
- To provide consistent and simple messages: 'good for training junior cardiac rehabilitation nurses', the 'prompts' in the PPEP 'provide standardised and consistent health education messages' and will be 'particularly good for training new CR nurses to the hospital'.
- To recognise resource implications of patient participation: 'need to spend about an hour with patients and sometime more..' prior to patient hospital discharge. Despite using 'prompts' in the PPEP to provide patients with key and simple health education messages 'the PPEP enabled patients to raise concerns they had' and 'patients tend to ask for more clarifications'.

- To extend the integration of the PPEP: 'We have now introduced and adapted the use of PPEP again when patients come back to attend the CR nurse outpatient appointment and at the Phase 3 cardiac rehabilitation teaching sessions when CR nurses can spend more time with patients'.
- To adapt to new ways of working: 'Initially, implementing the PPEP feels artificial', CR nurses found it difficult to use the PPEP at first and it was very time consuming at the beginning. To integrate the PPEP within the existing care packages take time, 'take some time to integrate the PPEP with the existing care packages and once that is done it feel spontaneous again.'

DISCUSSION

The main focus of the PPEP is to provide a better individual understanding of patients' illness condition and it is encouraging to note that results from the patient survey indicate that patients do have a better understanding of their cardiac condition three months later. Despite no significant changes reported in patients' anxiety and depression or their self-efficacy of exercise and diet, it is useful to note that the results show a significant improvement in patients' scores in 'General Health' which is the measure about patients' perception of their overall health, change in health condition and pain levels.

Overall the study findings are also consistent with the findings from the recent Cochrane Review (Coutler *et al.* 2015) as a personalised care planning intervention does not cause harm to patients and that it is safe to use with post-MI patients. It is also encouraging to note that patients provided positive feedback on the PPEP Patient Workbook and have used it to prepare for various types of follow-up

appointments in hospital and with the GP. Changes within the hospital's outpatients service and rehabilitation programme could encourage patients to use the workbook more often.

The CR nurses provided positive feedback for the implementation of the PPEP and highlighted that the PPEP increased patient participation and as a result they felt that the service had become more patient-centred. It is interesting to note that the practical issues of integrating the PPEP with current cardiac practice and making adjustments to existing documentations and procedures were not major barriers. Initially CR nurses did appear to be reluctant to deliver the new tools as the implementation of the innovation challenged practitioners' beliefs of their own expertise. Key feedback from the CR nurses identified their need to change their style of interaction with patients and this opened them up to the realisation that patients had surprising views about their health condition. After initial reluctance nurses seem to change their view of the tools being introduced and accepted their use once they had seen for themselves the benefits of the tools in practice. It would appear important, therefore, to allow time for new innovative practice to become embedded, and not to under estimate the involvement required of healthcare professionals in the development of the practice rather than just the training required, as this addresses the potential emotional aspects of implementing new practices which appear to undermine expertise and the established sense of professional competence.

To implement a shift to the personalised care approach within current healthcare services requires many barriers to be overcome at different micro and macro levels such as:

- the individual practitioner and the patient-provider interaction;
- how services within the centres are organised and delivered – whether in hospital wards/units, or primary care groups/centres, or health service delivery teams/care pathway teams; and
- the healthcare system in the country at the macro-level.

Given the range of barriers to innovation it is not surprising that concern has been expressed about the length of time research findings take to be put into practice. The Cooksey Report on United Kingdom healthcare research (2006) estimated it takes about 10 years to get research results put into routine practice. Indeed, in the case of the introduction of the PPEP, while the tool was seen as useful to support future training for junior colleagues, and to structure future visits for patients, nurses were concerned that such an approach required additional nursing time spent with patients prior to discharge and time to develop what amounts to a new the style of care. Therefore, acknowledgement of the importance of the adjustment process of CR nurses to deliver the new tools is particularly important. Time needs to be allowed for integration of practice and appropriate support for staff is vital, especially in the early stage of the implementation, for the success of implementing any new procedure.

The introduction of the PPEP does not mean less experienced and knowledgeable healthcare workers can deliver this discharge service effectively. Indeed, as the PPEP provides patients with an opportunity to ask for more clarifications and more questions it is essential that cardiac nurses knowledgeable about post MI care and are comfortable in answering detailed questions are involved to provide patients with appropriate and accurate information and support.

The positive feedback from CR nurses involved with the implementation of the tool indicates that the PPEP has made their practice more patient-centred, providing them with a structure to systematically recognise patients' views and expectations. The 'prompts' in the PPEP provide standardised and consistent health education messages. Importantly for the development of personalised care the PPEP increased time spent on patients' concerns and though this will require more resources to deliver a personalised discharge procedure the service evaluation, recommendation has been made to repeat the use of the IBP tool again during CR outpatient rehabilitation patient education sessions where CR nurses will have more time allocated to address patients' issues raised through the PPEP.

CONCLUSION

The evaluation indicates that the PPEP is a good example of a tool that can enable both staff and patients to engage in dialogue to plan care. The structure of the PPEP enables staff to systematically collect and use the patients' perceptions and beliefs about their illness to be able to respond to patients' individual concerns and help them to identify strategies to respond effectively to their ongoing health condition. The approach enables patients to explore their concerns and receive a consistent promotion of key health messages. They are empowered to become more engaged with their care planning, more confident to ask relevant questions and prepare effectively for future meetings with professionals involved in their care pathway in and outside hospital.

The evaluation of this service innovation has shown that the principles of the PPEP are relevant to CR practice in the UK to promote personalised care systematically,

and that it is feasible to integrate the PPEP with existing CR care practice. Further development and testing is indicated in randomised control trials, while a more in-depth qualitative review of staff perceptions of their experience of its application in practice would be useful. A full economic assessment of the use of PPEP would be particularly helpful to inform concerns about increased nursing time during discharge.

RELEVANCE TO CLINICAL PRACTICE

While personalised care planning has been identified as a desirable goal for some time now, and healthcare professionals are encouraged to move away from 'traditional ways' where they are the primary decision-makers, the shift to 'a partnership model' (Coulter *et al.* 2013) is difficult.

Nurses are reluctant to spend more time with patients before hospital discharge because of lack of time/resource. To be effective, however, it is important that the patient-centred care approach needs to be encouraged throughout the care pathways (integration). Healthcare professionals need to acknowledge and actively engage patients in their care planning and patients need to be supported and empowered to be an 'active patient'. There is much work to be done, but to identify tools and strategies to assist with the transition is important, as is the engagement of both staff and patients in the development of these new ways of working.

Summary Box: 'What does this paper contribute to the wider global clinical community?'

- To implement research into clinical practice, healthcare professionals need time to make both the practical and emotional adjustments to adopt a patient-centred care approach.
- The Personalised Patient Educational Protocol provides a structure to increase patient engagement in their care planning.
- The Personalised Patient Educational Protocol can be integrated into an existing cardiac care pathway.

REFERENCES

Alsen P, Brink E. (2013) Fatigue after myocardial infarction – a two-year follow-up study. *Journal of Clinical Nursing* 22: 1647-1652.

Broadbent E, Petrie KJ, Weinman J. (2006) The Brief Illness Perception Questionnaire. *Journal of Psychosomatic Research* 60: 631-637.

Cooksey D. (2006) *A review of health UK research funding*. The Stationery Office.

Connolly S, Holden A, Turner E (2011) MyAction: an innovative approach to the prevention of cardiovascular disease in the community. *British Journal of Cardiology* 18(4): 171-176.

Coulter A, Entwistle VA, Eccles A, Ryan S, Shepperd S & Perera R. (2015) Personalised care planning for adults with chronic or long-term conditions. *Cochrane Database of Systematic Reviews*: CD010523.

Coulter A, Roberts S & Dixon A. (2013) *Delivering better services for people with long-term conditions- Building the house of care*. The King's Fund.

Department of Health (DOH) (2013) *Cardiovascular Disease Outcomes Strategy*.
www.improvement.nhs.uk/CVDStrategy.aspx

Diefenbach MA, Leventhal H. (1996) The Common-Sense Model of Illness Representation: Theoretical and Practical Considerations. *Journal of Social Distress and the Homeless* 5(1): 11-38.

Dunn SL, Corser W, Stommel M, Holmes-Rovner M (2006) Hopelessness and Depression in the Early Recovery Period After Hospitalization for Acute Coronary Syndrome. *Journal of Cardiopulmonary Rehabilitation* 26(3): 152-159.

Dwamena F , Holmes-Rovner M , Gaulden CM, Jorgenson S , Sadigh G , Alla Sikorskii A, Lewin S, Smith RC , Coffey J , Olomu A, Beasley M (2012) Interventions for providers to promote a patient-centred approach in clinical consultations (Review). Wiley & Sons: The Cochrane Collaboration.

Edmondson D, Cohen BE. (2013) Posttraumatic Stress Disorder and Cardiovascular Disease. *Progress in Cardiovascular Diseases* 548-556.

Frasure-Smith N, Lesperance F, Talajic M. (1995) The Impact of Negative Emotions on Prognosis Following Myocardial Infarction: Is it More Than Depression? *Health Psychology* 14(5): 388-398.

Godin G, Shephard RJ. (1985) A simple method to assess exercise behaviour in the community. *Canadian Journal of Applied Sport Sciences* 9-10:141-146.

Hickey ML, Owen SV, Froman RD.(1992) Instrument Development: Cardiac Diet and Exercise Self-Efficacy. *Nursing Research* 41(6): 347-351.

Hildebrand DK. (1986). *Statistical thinking for behavioral scientists*. Boston: Duxbury.

IBM Corp. Released 2013. *IBM SPSS Statistics for Windows, Version 22.0*. Armonk, NY: IBM Corp.

Lane D, Carroll D, Ring C, Beevers G, Lip GYH (2002) The prevalence and persistence of depression and anxiety following myocardial infarction. *British Journal of Health Psychology* 7: 11-21.

Lau-Walker M. (2006) A conceptual care model for individualized care approach in cardiac rehabilitation – combining both illness representation and self-efficacy.

British Journal of Health Psychology 11: 103-117.

Lau-Walker M. (2014) Personalising health promotion for more impact. *Nursing Times* 110 (44) 18-20.

Lavie CJ, Milani RV. (2006) Adverse Psychological and Coronary Risk Profiles in Young Patients With Coronary Artery Disease and Benefits of Formal Cardiac Rehabilitation. *Archives of Internal Medicine* 166: 1878-1883.

Lazarus RS, Folkman S. (1984) Stress, appraisal, and coping. Springer Publication: New York.

Leventhal H, Nerenz DR, Steele DJ. (1984) Illness Representations and Coping with Health Threats. In *Handbook of Psychology and Health* Vol. 4. (Baum A, Taylor SE, Singer JE. ed.) Lawrence Erlbaum Associates: London. Chapter 9.

McMillan SS , Kendall E, Sav A, King MA, Whitty JA, Kelly F, Wheeler AJ (2013) Patient-Centred Approaches to Healthcare: A systematic review of Randomized Controlled Trials. *Medical Care Research and Review*, 70(6): 567-596.

National Institute of Health and Care Excellence (NICE) (2013) *Commissioning Guides: Cardiac Rehabilitation Services*.

Nelson EC, Landgraf JM, Hays RD, Wasson JH, Kirk JW (1990) The Functional Status of Patients: How can it be measured in Physicians' Offices? *Medical Care* 28(12): 1111-1126.

Orrell A, Doherty P, Miles J, Lewin R (2007) Development and validation of a very brief questionnaire measure of physical activity in adults with coronary heart disease. *European Journal of Cardiovascular Prevention and Rehabilitation* 14: 615-623.

Roest AM, Martens EJ, Denollet J, de Jonge P (2010) Prognostic Association of Anxiety Post Myocardial Infarction With Mortality and New Cardiac Events: A Meta-Analysis. *Psychosomatic Medicine* 72(6): 563-569.

Shepperd S , Lannin NA, Clemson LM , McCluskey A , Cameron ID, Barras SL (2013) Discharge planning from hospital to home. *Cochrane Database of Systematic Reviews*: CD000313.

The British Association of Cardiovascular Prevention and Rehabilitation (BACPR). (2012) Standards and Core Components for Cardiovascular Disease Prevention and Rehabilitation. 2nd Edition, British Heart Foundation.

Wood DA, Kotseva K, Connolly S (2008) Nurse-coordinated multidisciplinary, family-based cardiovascular disease prevention programme (EUROACTION) for patients with coronary heart disease and asymptomatic individuals at high risk of cardiovascular disease: a paired, cluster-randomised controlled trial. *Lancet* 371:1999-2012

Zigmond AS, Snaith RP. (1983) The Hospital Anxiety and Depression Scale. *Acta Psychiatrica Scandinavica* 67: 361-70.

Table 1: Demographics & Illness Information of Participants	
Participant demographics characteristics:	n(%)
Age(years) (±12)	mean SD= 58
Gender	
Male	58(78.4)
Female	16(21.6)
Ethnicity	
British	61(82.4)
Non-British	13(17.6)
Marital Status	
Not in any relationship	26(35.1)
Currently in a relationship	47(63.5)
Not stated	1(1.4)
Living With	
Partner/spouse	49(66.2)
Alone	16(21.6)
Relative	9(12.2)
Employment Status	
Working	43(58.1)
Not working	31(41.9)
Participant illness information:	n(%)
Route to Treatment	
Direct to Heart Attack Centre(HAC)	58(78.4)
Other hospital referral to HAC	13(17.6)
Self-presented to HAC	3(4.1)
Type/Location of MI	
Anterior/Multi-territory	42(51.3)
Other	32(48.7)
Ejection Fraction (EF) % (±7.3)	mean SD= 45
Complications pre hospitalisation	
Cardiac Arrest	6(8.1)
None	68(91.9)
Treatment Given	
Primary PCI + stents	69(93.2)
Other	5(6.8)
Length of Stay(hrs)	median=78 (IQR=72-101)

Table 2: Summary score variables – analysis of change from baseline to three months

Summary scores:	Mean (SD)			95% Confidence Intervals		Pr>t
	Baseline	3 months	Difference	Lower	Upper	
IBQ 'Timeline' (n=50)	7.02 (3.18)	7.86 (2.81)	-0.84 (4.09)	-2.69	1.01	0.97
IBQ 'Personal control' (n=51)	5.65 (2.80)	6.41 (2.08)	-0.76 (3.15)	-2.18	0.65	0.86
IBQ 'Treatment control' (n=51)	8.53 (1.74)	8.12 (1.82)	0.41 (2.16)	-0.56	1.38	0.99
IBQ 'Identity' (n=51)	2.73 (2.76)	3.84 (2.77)	-1.12 (3.35)	-2.62	0.28	0.36
IBQ 'Concern' (n=51)	7.49 (2.79)	6.57 (2.83)	0.92 (3.95)	-0.85	2.69	0.90
IBQ 'Emotion' (n=51)	5.14 (3.49)	4.96 (3.19)	0.18 (3.96)	-1.60	1.95	1.00
IBQ 'Consequence' (n=51)	5.39 (3.11)	4.90 (2.56)	0.49 (3.56)	-1.10	2.08	1.00
IBQ 'Understanding' (n=51)	6.16 (2.94)	7.61 (1.93)	-1.45 (2.90)	-2.61	-0.30	0.021
HAD 'Anxiety' (n=48)	8.19 (5.04)	7.52 (5.28)	0.67 (4.91)	-1.61	2.94	1.00
HAD: 'Depression' (n=49)	3.98 (3.32)	4.92 (4.04)	-0.94 (3.67)	-2.62	0.74	0.82
Self-efficacy 'SE Exercise' (n=34)	43.21 (15.67)	53.85 (17.47)	-10.65 (21.31)	-21.36	0.49	0.17
Self-efficacy 'SE Diet' (n=34)	50.50 (15.56)	56.65 (13.47)	-6.15 (20.31)	-17.61	5.31	0.85
TAM 'Strenuous frequency' (n=47)	1.17 (2.03)	1.62 (1.84)	-0.45 (2.19)	-1.47	0.58	0.98
TAM 'Moderate-frequency' (n=47)†	3.38 (4.02)	4.40 (2.74)	-1.02 (4.48)	-3.12	1.08	0.94
TAM 'Mild-frequency' (n=45)†	4.09 (4.98)	6.42 (4.61)	-2.33 (5.75)	-4.97	0.29	0.16
TAM 'Strenuous-length' (n=44)†	12.16 (26.13)	23.84 (29.35)	-11.68 (35.59)	-29.72	3.12	0.44
TAM 'Moderate-length' (n=45)†	17.29 (22.37)	26.51 (23.29)	-9.22 (33.39)	-25.27	6.83	0.79
TAM 'Mild-length' (n=45)†	26.89 (36.76)	29.67 (21.52)	-2.78 (37.64)	-20.87	15.31	1.00
Dartmouth QoL: 'General Function' (n=44)	10.20 (3.87)	8.45 (3.94)	1.75 (4.06)	-0.15	3.90	0.21
Dartmouth QoL: 'General Health' (n=43)	9.04 (2.95)	7.37 (2.65)	1.67 (3.08)	0.15	3.41	0.041
Dartmouth QoL: 'Quality of life'(n=45)†	4.62 (1.85)	4.13 (1.97)	0.49 (1.74)	-0.35	1.33	0.76

† bootstrap probability (Pr>t) and 95% confidence intervals presented when skewness and/or kurtosis outside the range -2 to +2.

Table 3: Patient responses to the use of PPEP Patient Workbook at 3 months after discharge (n=51)

<p>1. Did you find the PPEP Workbook Useful?</p>	<p>Yes = 30 (59%) No response= 21(41%)</p>	
<p>2. How useful did you find the PPEP Patient Workbook?</p>	<p>Mean (SD) = 7.0 (\pm 2.42) (Scale of 1 -10: not helpful to very helpful)</p>	
<p>3. Where Useful, Did you utilise the workbook in preparation for any of these/other appointments?</p>	<p>General Practitioner Surgery</p>	<p>16 (31%)</p>
	<p>Cardiologist Consultant hospital outpatient appointment</p>	<p>15 (29%)</p>
	<p>CR Nurse Outpatient Appointment</p>	<p>10 (20%)</p>
	<p>Telephone consultation</p>	<p>1 (2%)</p>
	<p>No response</p>	<p>9 (18%)</p>