Factors which may affect attendance at cardiac rehabilitation

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Introduction

Aim of the study

This study considered factors that may influence the take up of phase three cardiac rehabilitation in three centres across Dorset (based in Bournemouth, Poole and Dorchester).

Objectives of the study

- Review current knowledge relating to attendance at cardiac rehabilitation and structure the study appropriately within the resources available.
- Compare those who opt to attend and those who decline rehabilitation at the three rehabilitation programmes, in order to gain insight into why an individual may not attend.
- Gain further insight into why an individual may not attend cardiac rehabilitation services as recommended, through interviews.

The cardiac rehabilitation service in each of the three centres is linked to the acute cardiac services at the local acute Trusts (The Royal Bournemouth and Christchurch Hospitals NHS Trust, West Dorset General Hospitals NHS Trust and Poole Hospital NHS Trust).

Literature Review

Nationally, cardiac rehabilitation services have developed for those with established heart disease, especially those who have suffered an acute myocardial infarction or those who have undergone cardiac surgery. The overall aim of a rehabilitation programme is to facilitate physical, psychological and emotional recovery and to enable achievement of a healthy lifestyle. A recent Cochrane Review (Jolliffe et al., 2003) stated that exercise-based cardiac rehabilitation is effective in reducing cardiac deaths. It was not clear from the review, however, whether exercise only or a comprehensive cardiac rehabilitation intervention (including education and support) is more beneficial. The populations sampled within the studies considered in the review were predominantly male, middle-aged and low risk. The reviewers commented that patients who would have benefited most from the intervention might have been excluded from the trials on the grounds of age, sex or co-morbidity.

Cardiac rehabilitation services across the three areas under consideration within this study aim to achieve benefits through a combination of exercise and education. The National Service Framework for Coronary Heart Disease (CHD) states that:

> …all patients (with a recent myocardial infarction) will be encouraged to attend a cardiac rehabilitation programme if appropriate. Health visitors and practice nurses will also offer support to the patient and their family to help them adjust to the event and any consequent changes (DOH, 2000, p28).

In relation to the uptake of cardiac rehabilitation, current knowledge would suggest that uptake rates relate mainly to either ‘service’ or ‘patient’ factors (NHS Centre for Reviews, 1998). The service factors tend to focus on the ‘invitation’ to participate and logistical issues, such as the availability and accessibility of services, whereas patient factors may relate to individual well being, circumstances and motivation (Grimwood et al., 2000).

Uptake following invitation to rehabilitation is lower in women of all ages, and in the elderly across both genders (McGee & Horgan, 1992; Radley et al., 1996; Pell et al., 1996; Ades et al., 1992). This may be connected to the individual’s feelings that it would be inappropriate for them to attend, or that they would feel awkward and out of place (Campbell et al., 1994).

Other possible reasons for not taking up the service are wrong or inadequate information and individual lack of motivation. Smokers and those suffering a first myocardial infarction have been shown to be less motivated to attend (Levy, 1993).

Socio-demographic factors that may affect take up of cardiac rehabilitation include level of education, partner involvement and deprivation. These seem to be significant predictors of uptake (Pell et al., 1996; Ades et al., 1992). The distance from cardiac rehabilitation services and lack of social support have also been associated with non-attendance at rehabilitation programmes in studies (Schulz & McBurney, 2000). The NHS Centre for Reviews and Dissemination Report (1998) on cardiac rehabilitation services recommended that further research is needed to identify reasons for, and strategies to improve, the current levels of take up in the groups discussed here.

Research Design

The two research methodologies used within this study have enabled different insights into the same issue to be gained. Research using both qualitative and quantitative methods maximises the relevant insights that can be gained from a study. Each method serves as a critical vantage point for viewing the other, thus providing a fuller and more dynamic understanding of a problem (Katz & Mishler, 2003).

The first part of this study examined quantitative data relating to individuals who opted to attend and those who declined phase three cardiac rehabilitation (for the full proposal as presented to the ethics committees, see Appendix 1). This data was collected retrospectively over a twelve-month period. There was no intention to compare data between the three centres within the design of this study as some differences in provision exist. The findings will, therefore, only be presented separately for each of the three centres when methodologically appropriate and in order to enable further insights into each variable for the benefit of that centre.

The researcher accessed data for Stage 1 of the study from the computerised records which are routinely collected by rehabilitation staff for the West Dorset County Hospitals NHS Trust. For both attenders and non-attenders, the following data were extracted: gender, age, postcode (first section only) and presenting problem. No additional record keeping or record retrieval was required by the rehabilitation staff, as the required data were extracted from existing records.

In order to retrieve the necessary data from both Poole Hospital NHS Trust and The Royal Bournemouth and Christchurch Hospitals NHS Trust, the researcher collected information on the four variables from the rehabilitation staff records. Spreadsheets were then created for analysis (for protocol amendment submitted to ethics committees relating to this method of data collection, see Appendix 2).

The data was analysed and compared for both those who opted to attend rehabilitation and those who declined, in relation to the following variables:

- gender (nominal data);
- age (distributive data);
- postcode (nominal data);
- cardiac problem through which they qualify for cardiac rehabilitation (nominal data).

The second part of the study consisted of qualitative, semi-structured taped interviews (for interview guide, see Appendix 4). All individuals who were recorded within rehabilitation records as having declined cardiac rehabilitation, and were not hospital in-patients, or deceased, were asked for an interview. This occurred over a six month period until March 2003 (for letter sent, see Appendix 5; for information sheet, see Appendix 6).

Telephone interviews were completed with individuals who had given their consent. Telephone interviews have been found to offer a number of benefits when used for semi-structured qualitative interviews in healthcare research (Bowman et al., 1994; Barriball et al., 1996). These benefits include allowing anonymity for respondents and offering good value for money. Telephone interviews have been used in order to enable patient follow up after discharge (Bowman et al., 1994) and as a means of surveying measures taken to respond to the NHS Community Care Act (Barriball et al., 1996).

A generic qualitative research approach was used within this study (Caelli et al., 2003) for both the development of the interview guide and the analysis of the interview data. This means that the design was led by the literature reviewed to inform the study, rather than by any specific qualitative research methodology. The literature led the researcher to focus on two areas to explore with interviewees. The first one being practical or 'structural factors', such as venue or travel arrangements, which may inhibit attendance, and the second being 'patient factors', such as beliefs about the appropriateness of rehabilitation and the information they had been given. The interview guide was then designed by focusing on key structural factors, while also offering the opportunity to explore the individuals' understanding of, and beliefs about, cardiac rehabilitation in relation to themselves and their experience of their illness. The interview data were then analysed by considering the interviewees' reports of problems experienced, and through exploration of whether they felt cardiac rehabilitation was appropriate for them.

Ethical issues

Ethical approval was applied for separately for parts one and two of the study. The following ethics/research committees were all approached successfully prior to commencement of each part of the study:

- East Dorset Local Research Ethics Committee;
- West Dorset Local Research Ethics Committee;
- Poole Hospital NHS Trust Research Committee;
- Royal Bournemouth and Christchurch Hospitals NHS Trust Research Committee;
- West Dorset Hospitals NHS Trust Research Committee.

All anonymous spreadsheet data regarding attendance at cardiac rehabilitation programmes were stored on the password-protected Bournemouth University internal network by the researcher (Ann Hemingway, Practice Development Fellow, Institute of Health and Community Studies, Bournemouth University). Data that identified individuals were destroyed on completion of each interview, and the interview notes were labelled only with the four variables considered within the study (age, gender, first stage of postcode and cardiac problem).

Quantitative Data Sampling

Those individuals who opted to attend phase three cardiac rehabilitation and those individuals who declined were included within two sample groups for comparison across four variables:

- age;
- gender;
- first part of postcode;
- cardiac problem.

This data was collected across the three centres involved within this study over a 12-month period to March 2003.

Inclusion criteria

For those who *opted to attend* rehabilitation:

- completion of phase three cardiac rehabilitation (as measured by the providing cardiac rehabilitation programme);
- non-completion due to sickness, which occurred after the individual had attended more than one rehabilitation session.

For those who *declined* rehabilitation:

- a clear recording within the rehabilitation staff records that the individual had declined to undertake phase three cardiac rehabilitation.

Exclusion criteria

For those who *opted to attend* rehabilitation:

- an assessment by healthcare professionals that the individual was too unwell to complete phase three cardiac rehabilitation following referral to the programme;
- non-attendance at any phase three rehabilitation sessions;
- unclear diagnosis;
- out of Dorset postcode.

For those who *declined* rehabilitation:

- no clear recording within the rehabilitation staff records that the individual declined to undertake phase three cardiac rehabilitation;
- unclear diagnosis;
- out of Dorset postcode.

Age

Data relating to the *age* of individuals were organised into four groups: under 60, 61-70, 71-80 and over 80.

Gender

Data relating to the *gender* of individuals were organised into two groups:

male and female.

Postcode

Data relating to the *postcode* of individuals were analysed independently (using all postcodes), and then further organised into two sets of two for comparison. Postcodes relating to the urban conurbation in which the rehabilitation programme was situated, were compared with other postcodes outside that area. Postcodes which contained areas of local deprivation were compared with other postcodes outside those areas (BH5 Boscombe, BH8 Townsend, BH11 East and West Howe, BH12 Wallisdown, BH16 Turlin Moor and DT4+5 Weymouth and Portland (Annual Public Health Reports, 2002)).

Cardiac problem

Currently, individuals may be referred to rehabilitation from within the host Trust, or may be referred from other treatment centres (including those abroad) following a period of illness. All three centres commonly accept referrals for individuals who have suffered a myocardial infarction, and following cardiac surgery (including both coronary artery by-pass grafts and valve replacements). Individuals who had suffered a myocardial infarction and then gone on to have further treatment were recorded for the purposes of the study as having suffered a myocardial infarction. The rehabilitation programme based at The Royal Bournemouth and Christchurch Hospitals NHS Trust does not routinely take referrals for individuals suffering with angina or following angioplasty.

For *Poole and Dorchester* referrals, data relating to the *cardiac problem* were therefore organised into four groups:

- post myocardial infarction;
- post coronary artery by-pass graft;
- post valve replacement;
- individuals suffering with angina or post PTCA/Stent.

For *Bournemouth* referrals, data relating to the *cardiac problem* were organised into three groups:

- post myocardial infarction;
- post coronary artery by-pass graft;
- post valve replacement.

Exercise Advice Group

Over the period of data collection for this part of the study, the rehabilitation programme (at Poole Hospital NHS Trust) ran an *exercise advice group* for individuals to access if they were not intending to undertake phase three cardiac rehabilitation. It consisted of an education session relating to lifestyle change. The individuals who attended these sessions were not included within the data for the first stage of this

statistical analysis. Individuals could either opt to do this class, or do it because they were symptomatic with the intention of completing phase three cardiac rehabilitation at a future date. This meant that they did not fulfil the criteria as stated here.

However, a separate analysis will be made comparing those who attended this education class for the year and those who opted to do phase three cardiac rehabilitation or declined cardiac rehabilitation. In addition, individuals who attended this group were included within the interview sample.

Quantitative Data Analysis

Quantitative data analysis was undertaken using SPSS for Windows, and cross-tabulation analysis was undertaken to examine how scores on the variables were related. Whether the individual opted for rehabilitation or declined was the consistent variable throughout the cross-tabulation analysis. A chi-square test was used to compare the number of cases falling into each cell, with the frequency that would be expected if there was no association between variables. A value of less than p .005 was seen as significant.

Where significant findings were made, further logistical regression analysis was undertaken in order to analyse multi-way contingency tables of frequency counts (cross-tabulations). This involved transforming the frequency values into their natural logs and had the benefit of allowing tests for interactions in the classifications that could affect the outcomes of data analysis.

The findings are presented in table and bar chart form, and have only been analysed across the three centres where the inclusion and exclusion criteria and individual variable characteristics are consistent. Each variable is considered in turn. However, Table 1 gives overall information regarding the sample numbers for each of the three areas relating to those who opted to attend cardiac rehabilitation and those who declined for the twelve-month period.

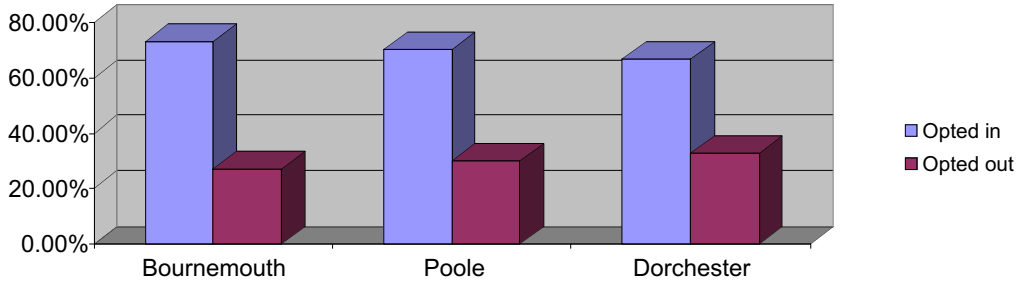
The statistical findings have been presented individually to provide further detailed information on the four variables for the areas where they are significant, rather than to compare differences between the three centres. This is because there are some differences in provision and population between the areas, which make comparisons unreliable.

Table 1. Those who opted for rehab and those who opted against, cross-tabulated against all three areas

	Opted in/opted out	Area 1	2	3	Total
	Opted in	368	233	242	843
	% within AREA	73.2%	70.0%	67.0%	70.4%
	Opted out	135	100	119	354
	% within AREA	26.8%	30.0%	33.0%	29.6%
Total	Total	503	333	361	1197
	% within AREA	100.0%	100.0%	100.0%	100.0%

Area: 1 = Bournemouth; 2 = Poole; 3 = Dorchester.

Bar Chart 1. Those who opted for rehab and those who opted against, cross-tabulated against all three areas



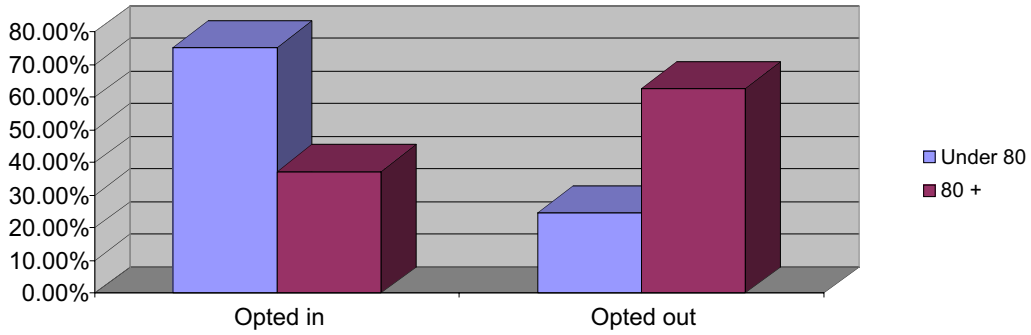
Age

Table 2. Age cross-tabulation analysis for all three areas

		Opted in	Opted out	Total
Total	Under 80	787	260	1047
	%	75.2%	24.8%	100.0%
	80+	56	94	150
	%	37.3%	62.7%	100.0%
	Total	843	354	1197
	%	70.4%	29.6%	100.0%

P= .000

Bar Chart 2. Age cross-tabulation analysis for all three areas



The comparison of those aged 80 and under with those aged over 80 showed that the older age group was unlikely to attend cardiac rehabilitation. Statistically, this result was significant when the data from all three areas were analysed.

However, in order to further examine the issue of age, cross-tabulation and chi-square testing in relation to age and area was undertaken. The results are shown in Tables 3, 4 and 5.

Table 3. Age cross-tabulation in Area 1 (Bournemouth), using detailed age groups

		Opted in	Opted out	Total
Age	1	81	27	108
	% within AGE	75.0%	25.0%	100.0%
	2	117	26	143
	% within AGE	81.8%	18.2%	100.0%
	3	135	51	186
	% within AGE	72.6%	27.4%	100.0%
	4	35	31	66
	% within AGE	53.0%	47.0%	100.0%
Total	Total	368	135	503
	% within AGE	73.2%	26.8%	100.0%

P= .000

Age: 1 = 60 and below; 2 = 61-70; 3 = 71-80; 4 = over 80.

Bar Chart 3. Age cross-tabulation in Area 1 (Bournemouth)

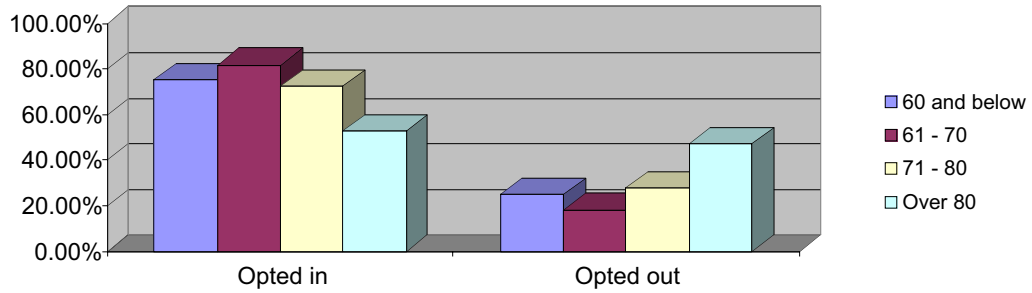


Table 4. Age cross-tabulation in Area 2 (Poole), using detailed age groups

		Opted in	Opted out	Total
Age	1	85	24	109
	% within AGE	78.0%	22.0%	100.0%
	2	81	33	114
	% within AGE	71.1%	28.9%	100.0%
	3	64	31	95
	% within AGE	67.4%	32.6%	100.0%
	4	3	12	15
	% within AGE	20.0%	80.0%	100.0%
Total	Total	233	100	333
	% within AGE	70.0%	30.0%	100.0%

P= .000

Age: 1 = 60 and below; 2 = 61-70; 3 = 71-80; 4 = over 80.

Bar Chart 4. Age cross-tabulation in Area 2 (Poole)

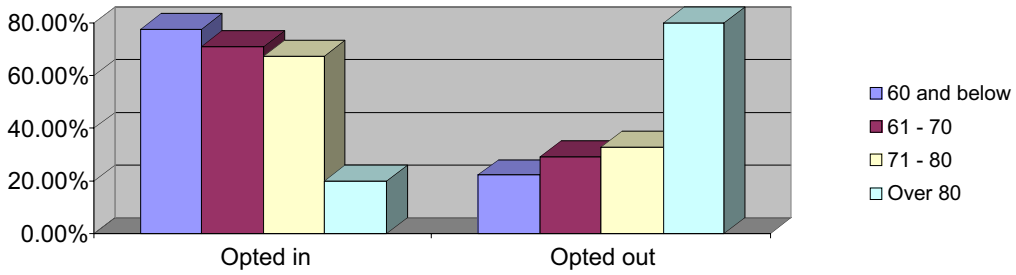


Table 5. Age cross-tabulation in Area 3 (Dorchester), using detailed age groups

		Opted in	Opted out	Total
Age	1	48	16	64
	% within AGE	75.0%	25.0%	100.0%
	2	85	21	106
	% within AGE	80.2%	19.8%	100.0%
	3	91	31	122
	% within AGE	74.6%	25.4%	100.0%
	4	18	51	69
	% within AGE	26.1%	73.9%	100.0%
Total	Total	242	119	361
	% within AGE	67.0%	33.0%	100.0%

P= .000

Age: 1 = 60 and below; 2 = 61-70; 3 = 71-80; 4 = over 80.

Bar Chart 5. Age cross-tabulation in Area 3 (Dorchester)

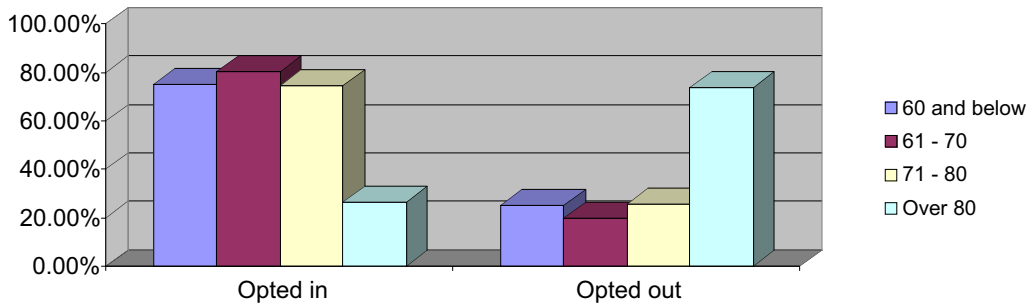


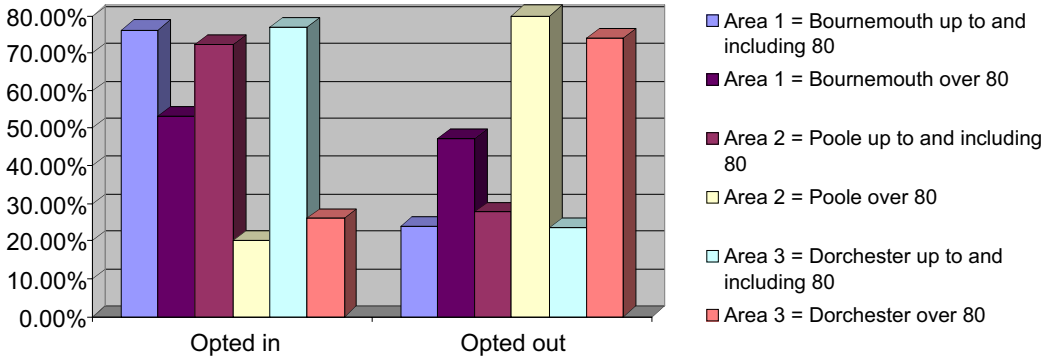
Table 6 shows grouped age (80 and under, over 80) cross-tabulated with those who opted in and out of cardiac rehabilitation for all three areas combined.

Table 6. Grouped age cross-tabulation for all three areas

Area	Grouped age ranges	Opted in	Opted out	Total
1	Up to & incl. 80	333	104	437
	% within GPAGE	76.2%	23.8%	100.0%
	Over 80	35	31	66
	% within GPAGE	53.0%	47.0%	100.0%
Total	Total	368	135	503
	% within GPAGE	73.2%	26.8%	100.0%
2	Up to & incl. 80	230	88	318
	% within GPAGE	72.3%	27.7%	100.0%
	Over 80	3	12	15
	% within GPAGE	20.0%	80.0%	100.0%
Total	Total	233	100	333
	% within GPAGE	70.0%	30.0%	100.0%
3	Up to & incl. 80	224	68	292
	% within GPAGE	76.7%	23.3%	100.0%
	Over 80	18	51	69
	% within GPAGE	26.1%	73.9%	100.0%
Total	Total	242	119	361
	% within GPAGE	67.0%	33.0%	100.0%

P= .000

Bar Chart 6. Grouped age cross-tabulation for all three areas



This analysis would seem to indicate that the association between age and opting out of cardiac rehabilitation is significant for all three areas.

Gender

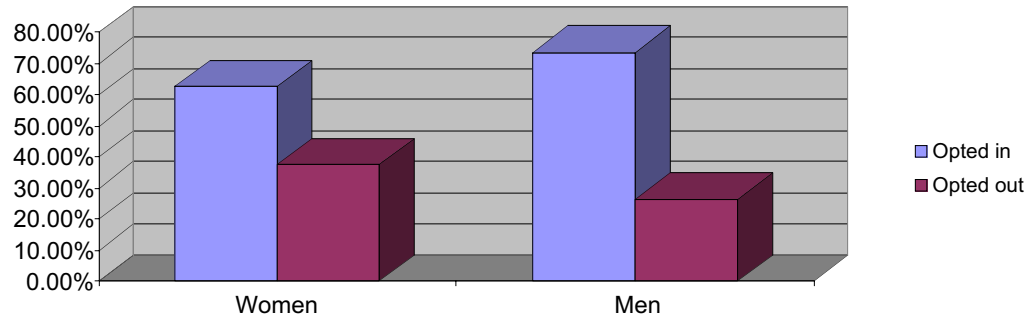
Tables 7 and 8 include gender cross-tabulation (chi-square test) for all three areas, and shows gender as a significant variable.

Table 7. Gender cross-tabulation for all three areas

	Opted in/opted out	Women	Men	Total
	Opted in	218	625	843
	% within GENDER	62.6%	73.6%	70.4%
	Opted out	130	224	354
	% within GENDER	37.4%	26.4%	29.6%
Total	Total	348	849	1197
	% within GENDER	100.0%	100.0%	100.0%

P= .000

Bar Chart 7. Gender cross-tabulation for all three areas



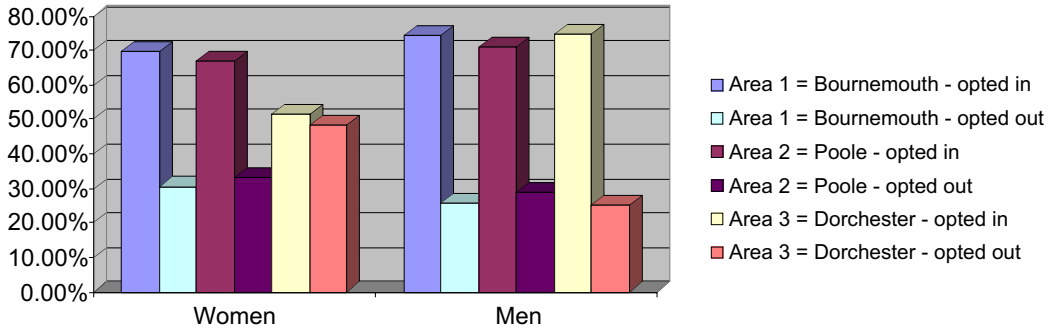
From the analysis of this aggregated data, women appear less likely to attend and more likely to opt out. However, when further cross-tabulation is undertaken, which includes area as a variable, the results are less clear for Areas 1 and 2.

Table 8. Gender area cross-tabulation

Area	Opted in/opted out	Women	Men	Total
1	Opt in	89	279	368
	% within GENDER	69.5%	74.4%	73.2%
	Opt out	39	96	135
	% within GENDER	30.5%	25.6%	26.8%
	Total	128	375	503
	% within GENDER	100.0%	100.0%	100.0%
2	Opt in	67	166	233
	% within GENDER	67.0%	71.2%	70.0%
	Opt out	33	67	100
	% within GENDER	33.0%	28.8%	30.0%
	Total	100	233	333
	% within GENDER	100.0%	100.0%	100.0%
3	Opt in	62	180	242
	% within GENDER	51.7%	74.7%	67.0%
	Opt out	58	61	119
	% within GENDER	48.3%	25.3%	33.0%
	Total	120	241	361
	% within GENDER	100.0%	100.0%	100.0%

Area: 1 = Bournemouth (P= .283); 2 = Poole (P= .439); 3 = Dorchester (P= .000).

Bar Chart 8. Gender area cross-tabulation



Although there are still percentage differences between men and women in Areas 1 and 2, statistically there is no significance to these changes. In Area 3, there is statistical significance, and the number of women who opt in and out of cardiac rehabilitation is similar.

Cardiac problem

Tables 9A, 9, 10 and 11 relate to cross-tabulations including cardiac problem, age, gender and area as variables.

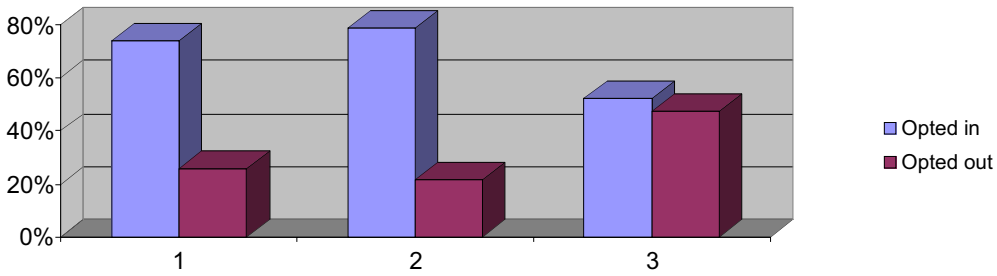
Table 9A. Bournemouth cardiac problem cross-tabulation

	Opted in/opted out	Cardiac Problem 1	2	3	Total
	Opted in	196	147	24	367
	%	74%	78.6%	52.3%	73%
	Opted out	71	41	23	135
	%	26%	21.4%	47.7%	26.9%
Total	Total	267	188	47	502
	%	100.0%	100.0%	100.0%	100.0%

P = .000

Cardiac problem: 1 = Myocardial Infarction; 2 = Post coronary artery by-pass graft; 3 = Post valve replacement.

Bar Chart 9A. Bournemouth cardiac problem cross-tabulation



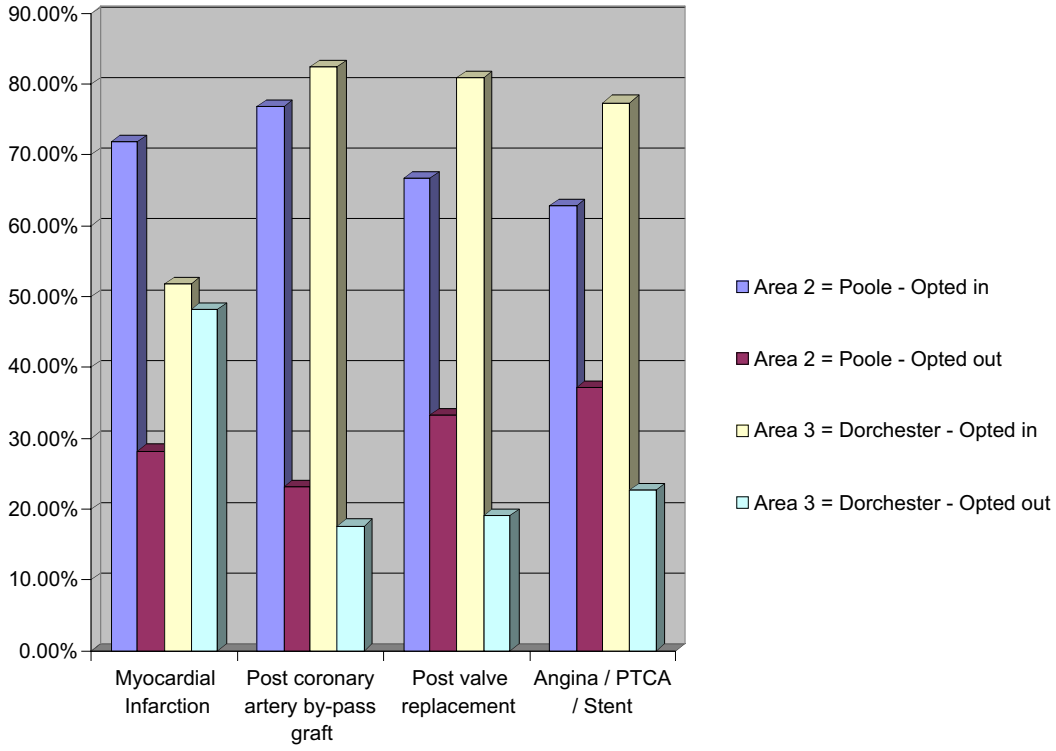
In order to further investigate this significance, and in consideration of the literature review, it is relevant to cross-tabulate for age and gender in relation to this finding. However, when further cross-tabulation for gender and age was undertaken the result was not statistically significant.

Table 9. Poole and Dorchester presenting problem area cross-tabulation

Area	Opted in/out		Presenting Problem 1	2	3	4	Total
2 Poole P= .281	Opted in		130	40	2	61	233
		% within PPROB	71.8%	76.9%	66.7%	62.9%	70.0%
	Opted out		51	12	1	36	100
		% within PPROB	28.2%	23.1%	33.3%	37.1%	30.0%
	Total	Total	181	52	3	97	333
		% within PPROB	100.0%	100.0%	100.0%	100.0%	100.0%
3 Dorch. P= .000	Opted in		88	75	38	41	242
		% within PPROB	51.8%	82.4%	80.9%	77.4%	67.0%
	Opted out		82	16	9	12	119
		% within PPROB	48.2%	17.6%	19.1%	22.6%	33.0%
	Total	Total	170	91	47	53	361
		% within PPROB	100.0%	100.0%	100.0%	100.0%	100.0%

Presenting Problem: 1 = Myocardial Infarction; 2 = Post coronary artery by-pass graft; 3 = Post valve replacement; 4 = Angina/PTCA/Stent.

Bar Chart 9. Presenting problem area cross-tabulation



For Area 3, the cross-tabulation between cardiac problem and whether an individual opted for cardiac rehabilitation or opted out has statistical significance. In order to investigate this significance further, and in consideration of the literature review, it is relevant to cross-tabulate for age and gender in relation to this finding.

Table 10. Presenting problem and age cross-tabulation for Area 3

Age	Opted in/ out		Presenting Problem 1	2	3	4	Total
Under 60	Opted in		21	7	11	9	48
		% within PPROB	77.8%	87.5%	78.6%	60.0%	75.0%
	Opted out		6	1	3	6	16
		% within PPROB	22.2%	12.5%	21.4%	40.0%	25.0%
	Total	Total	27	8	14	15	64
		% within PPROB	100.0%	100.0%	100.0%	100.0%	100.0%
61-70	Opted in		28	30	10	17	85
		% within PPROB	75.7%	81.1%	76.9%	89.5%	80.2%
	Opted out		9	7	3	2	21
		% within PPROB	24.3%	18.9%	23.1%	10.5%	19.8%
	Total	Total	37	37	13	19	106
		% within PPROB	100.0%	100.0%	100.0%	100.0%	100.0%
71-80	Opted in		26	35	16	14	91
		% within PPROB	56.5%	87.5%	88.9%	77.8%	74.6%
	Opted out		20	5	2	4	31
		% within PPROB	43.5%	12.5%	11.1%	22.2%	25.4%
	Total	Total	46	40	18	18	122
		% within PPROB	100.0%	100.0%	100.0%	100.0%	100.0%
Over 80	Opted in		13	3	1	1	18
		% within PPROB	21.7%	50.0%	50.0%	100.0%	26.1%
	Opted out		47	3	1	-	51
		% within PPROB	78.3%	50.0%	50.0%	-	73.9%
	Total	Total	60	6	2	1	69
		% within PPROB	100.0%	100.0%	100.0%	100.0%	100.0%

P= .004.

Presenting Problem: 1 = Myocardial Infarction; 2 = Post coronary artery by-pass graft; 3 = Post valve replacement; 4 = Angina/PTCA/Stent.

Bar Chart 10. Presenting problem and age cross-tabulation for Area 3

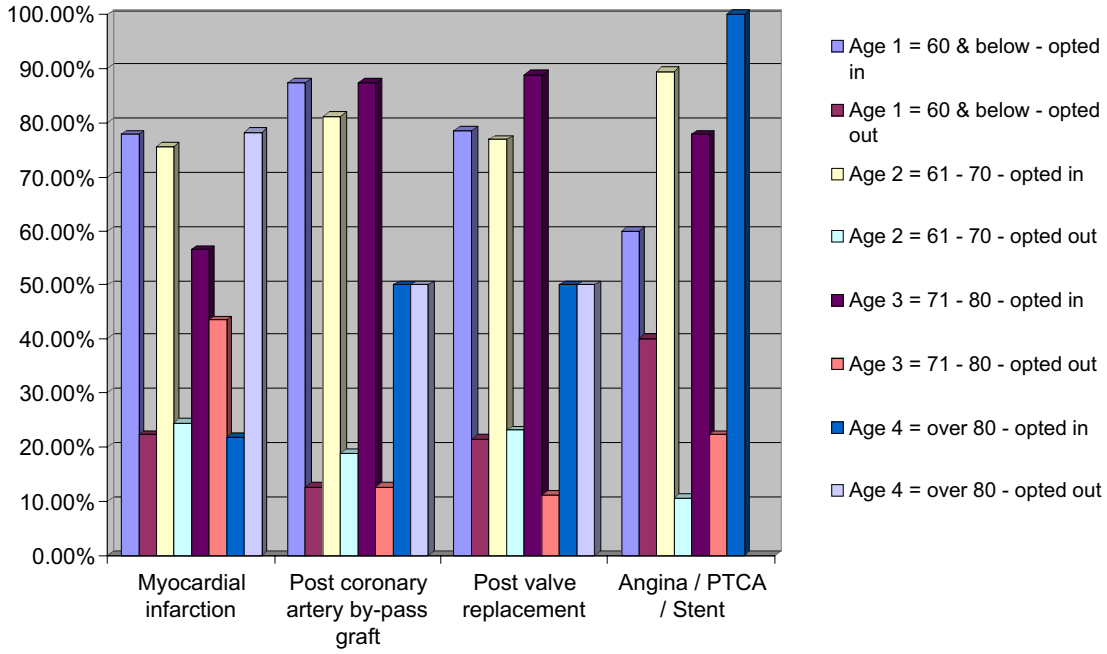


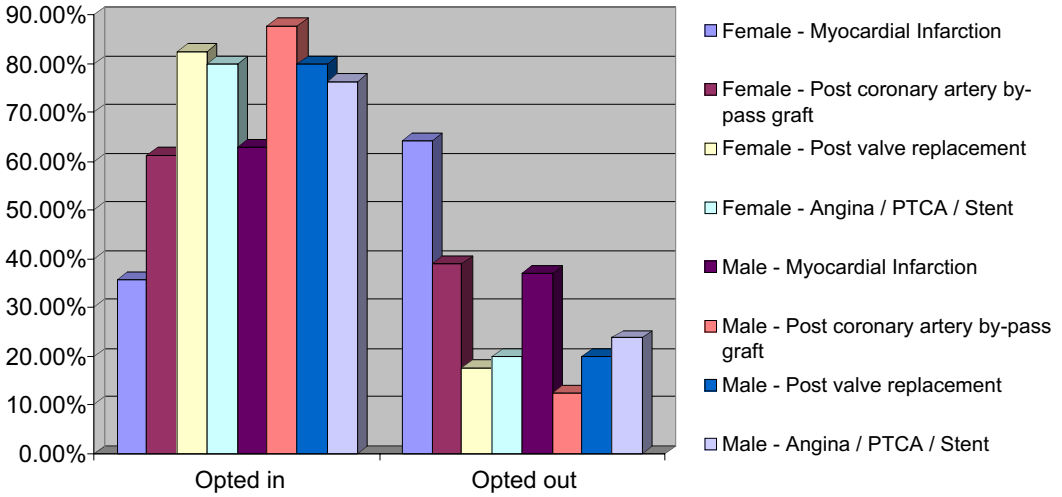
Table 11. Presenting problem gender cross-tabulation for Area 3

Presenting Problem			Opted in	Opted out	Total
Female	1		25	45	70
		% within PPROB	35.7%	64.3%	100.0%
	2		11	7	18
		% within PPROB	61.1%	38.9%	100.0%
	3		14	3	17
		% within PPROB	82.4%	17.6%	100.0%
	4		12	3	15
		% within PPROB	80.0%	20.0%	100.0%
	Total	Total	62	58	120
		% within PPROB	51.7%	48.3%	100.0%
Male	1		63	37	100
		% within PPROB	63.0%	37.0%	100.0%
	2		64	9	73
		% within PPROB	87.7%	12.3%	100.0%
	3		24	6	30
		% within PPROB	80.0%	20.0%	100.0%
	4		29	9	38
		% within PPROB	76.3%	23.7%	100.0%
	Total	Total	180	61	241
		% within PPROB	74.7%	25.3%	100.0%

P= .000.

Presenting Problem: 1 = Myocardial Infarction; 2 = Post coronary artery by-pass graft; 3 = Post valve replacement; 4 = Angina/PTCA/Stent.

Bar Chart 11. Presenting problem gender cross-tabulation for Area 3



It would appear from this further analysis of Area 3 that women who have suffered a myocardial infarction are more likely to decline cardiac rehabilitation than to opt to do it. It would also appear that those suffering a myocardial infarction over the age of 70 are less likely to attend.

In order to examine this finding further, logistical regression analysis was undertaken (see Appendix 7) to consider age, gender and presenting problem. The statistically significant findings gained through this suggest that the link between women, myocardial infarction and an increased likelihood of declining cardiac rehabilitation is not explained by the age of the women within this sample.

First stage of postcode

An analysis of all Dorset postcodes, cross-tabulated with opting in or out of rehabilitation, was undertaken. However, the findings were not significant and many of the postcodes within the analysis attracted small numbers, thus inhibiting meaningful analysis. Postcodes were therefore grouped to aid analysis.

Tables 12 and 13 relate to urban/rural cross-tabulation, and deprivation cross-tabulation. Neither produced results of significance. This may be due to having only analysed the first stage of postcodes in relation to this rehabilitation data, as this postcode information may be unable to indicate the detail of populations within parts of particular postcodes.

Table 12. Urban/rural cross-tabulation

		Urban	Rural	Total
Opted in		477	365	842
	% within Urban/Rural	70.1%	70.7%	70.4%
Opted out		203	151	354
	% within Urban/Rural	29.9%	29.3%	29.6%
Total		680	516	1196
	% within Urban/Rural	100.0%	100.0%	100.0%

P= .825

Bar Chart 12. Urban/rural cross-tabulation

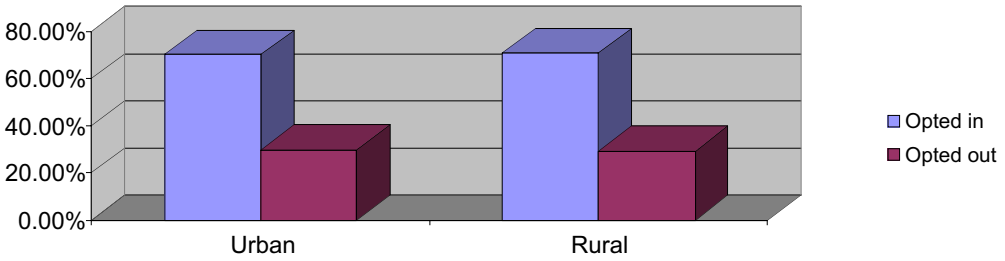
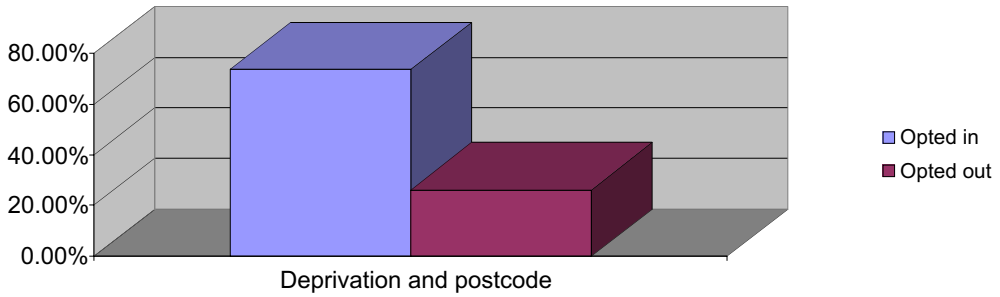


Table 13. Deprivation and postcode

		Dep	Total
Opted in		221	221
	% within deprivation	73.9%	73.9%
Opted out		78	78
	% within deprivation	26.1%	26.1%
Total		299	299
	% within deprivation	100.0%	100.0%

P= .299

Bar Chart 13. Deprivation and postcode



Poole exercise advice group cross-tabulations

Tables 14, 15 and 16 relate to cross-tabulations undertaken to consider those who opted in and out of rehabilitation, and those who opted for the exercise advice group in relation to the variables outlined.

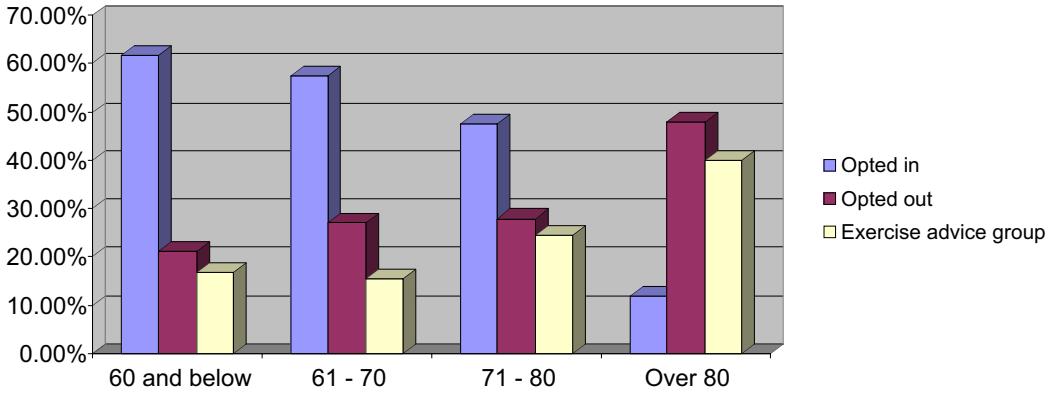
Table 14. Exercise advice group, rehabilitation, age cross-tabulation

		Age				
		1	2	3	4	Total
Opted in		70	70	53	3	196
	% within AGE	61.9%	57.4%	47.7%	12.0%	52.8%
Opted out		24	33	31	12	100
	% within AGE	21.2%	27.0%	27.9%	48.0%	27.0%
Ex Ad Group		19	19	27	10	75
	% within AGE	16.8%	15.6%	24.3%	40.0%	20.2%
Total	Total	113	122	111	25	371
	% within AGE	100.0%	100.0%	100.0%	100.0%	100.0%

P= .001

Age: 1 = 60 and below; 2 = 61-70; 3 = 71-80; 4 = Over 80.

Bar Chart 14. Exercise advice group, rehabilitation, age cross-tabulation



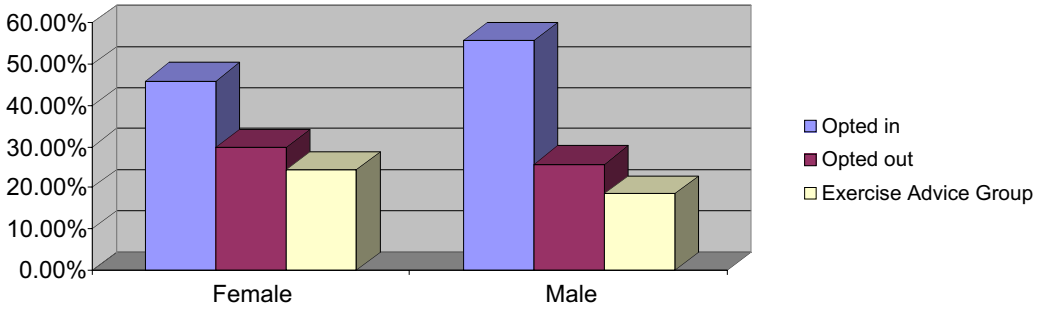
This analysis would appear to indicate that the exercise advice group was an attractive option for those over 70 and this increased with age.

Table 15. Exercise advice group, rehabilitation, gender cross-tabulation

		Female	Male	Total
Opted in		51	145	196
	% within GENDER	45.9%	55.8%	52.8%
Opted out		33	67	100
	% within GENDER	29.7%	25.8%	27.0%
Ex Ad Grp		27	48	75
	% within GENDER	24.3%	18.5%	20.2%
Total	Total	111	260	371
	% within GENDER	100.0%	100.0%	100.0%

P=.202

Bar Chart 15. Exercise advice group, rehabilitation, gender cross-tabulation



This analysis of gender did not show statistical significance. However, there are percentage differences between males and females in the different groups, with women being somewhat more likely to opt out of phase three rehabilitation and more likely to opt into the exercise advice group.

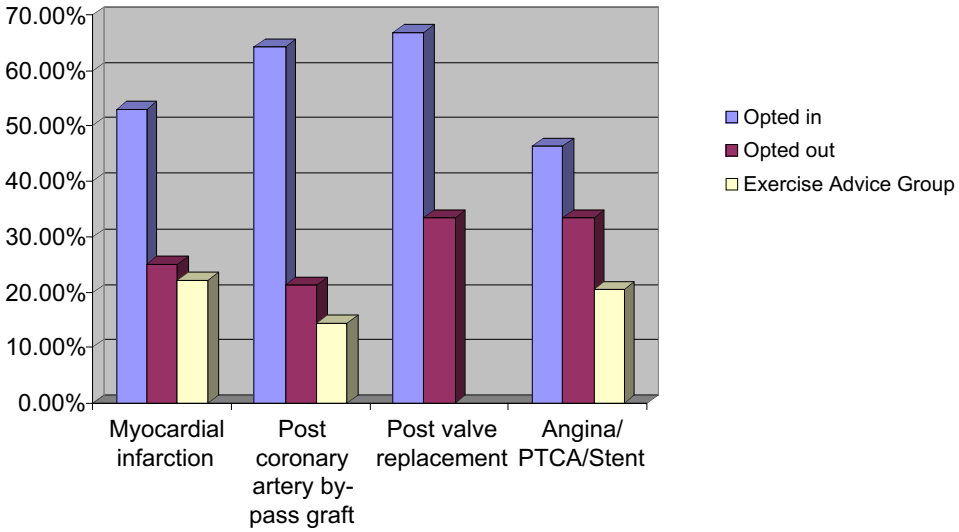
Table 16. Exercise advice group, rehabilitation, presenting problem cross-tabulation

		Presenting Problem				
		1	2	3	4	Total
Opted in		108	36	2	50	196
	% within PPROB	52.9%	64.3%	66.7%	46.3%	52.8%
Opted out		51	12	1	36	100
	% within PPROB	25.0%	21.4%	33.3%	33.3%	27.0%
Ex Ad Grp		45	8	-	22	75
	% within PPROB	22.1%	14.3%	-	20.4%	20.2%
Total	Total	204	56	3	108	371
	% within PPROB	100.0%	100.0%	100.0%	100.0%	100.0%

P= .330.

Presenting Problem: 1 = Myocardial Infarction; 2 = Post coronary artery by-pass graft; 3 = Post valve replacement; 4 = Angina/PTCA/Stent.

Bar Chart 16. Exercise advice group, rehabilitation, presenting problem cross-tabulation



No significant differences were found between groups through this cross-tabulation.

Postcode analysis

It was not possible to undertake analysis of postcode data for the sample of those individuals who attended the exercise advice group as the sample was too small for effective analysis.

Qualitative Data Sampling

Qualitative data for the study were gained through semi-structured telephone interviews with individuals who were recorded by rehabilitation service staff as having declined to undertake phase three cardiac rehabilitation. Individuals across the three centres who had been recorded as declining rehabilitation were contacted and asked for an interview over a six-month period. Overall, 122 letters requesting interviews were sent out, with 59 individuals agreeing to take part and 58 interviews being used to inform the study. Within 48 hours prior to undertaking the interview, a check was made with the referring Trust Patient Management System to ensure that the individual was not an in-patient or recently deceased.

Thirty-nine individuals were contacted to request permission for an interview from the Royal Bournemouth and Christchurch Hospitals NHS Trust rehabilitation programme (Area 1 on the tables below), 43 from the Poole Hospital NHS Trust programme (Area 2 on the tables below), and 40 from the West Dorset General Hospitals NHS Trust programme (Area 3 on the tables below).

Area	Written to	Interviewed (out of those written to)
1 (Bmth)	39	19
2 (Poole)	43	21
3 (W.Dorset)	40 = 122	18 = 58

Those written to in order to request an interview in relation to gender

Area	Gender		Total
	Female	Male	
1	10	29	39
2	14	29	43
3	22	18	40 = 122

Those subsequently interviewed in relation to gender

Area	Gender		Total
	Female	Male	
1	4	15	19
2	7	14	21
3	8	10	18 = 58

Those written to in order to request an interview in relation to age

Area	Up to and inc 60	61-70	71-80	81-90	91+	Total
1	16	6	10	6	1	39
2	9	6	20	8	-	43
3	4	4	14	12	6	40 = 122

Those subsequently interviewed in relation to age

Area	Up to and inc 60	61-70	71-80	81-90	91+	Total
1	7	1	8	3	-	19
2	4	3	11	3	-	21
3	3	1	9	4	1	18 = 58

Those written to in order to request an interview in relation to presenting problem

Area	M I	Post CABG	Post valve surgery	Angina/ PTCA/Stent	Total
1	26	9	4	-	39
2	24	5	-	14	43
3	34	4	2	-	40 = 122

Those subsequently interviewed in relation to presenting problem

Area	M I	Post CABG	Post valve surgery	Angina/ PTCA/Stent	Total
1	12	4	3	-	19
2	12	4	-	5	21
3	15	1	-	2	18 = 58

Those written to in order to request an interview in relation to postcodes

Area	Postcode = BH												SO	Total
1	1	6	7	8	9	11	20	22	23	24	25	31	41	
Count	3	1	1	3	2	2	1	2	8	4	7	1	4	= 39
Area	Postcode = BH													
2	12	13	14	15	16	17	18	19	21	23	24			
Count	2	3	4	7	6	2	9	1	5	3	1			= 43
Area	Postcode = DT													
3	1	2	3	4	6	8	10	11						
Count	3	6	5	10	6	5	1	4						= 40

Those subsequently interviewed in relation to postcodes

Area	Postcode = BH										Total
1	8	11	20	22	23	24	25				
Count	2	2	1	1	5	4	4				= 19
Area	Postcode = BH										
2	12	13	14	15	16	18	19	21	23	24	
Count	1	1	2	1	3	7	1	3	1	1	= 21
Area	Postcode = DT										
3	1	2	3	4	6	8	11				
Count	2	4	2	4	3	1	2				= 18

The interviews lasted approximately 15 to 20 minutes. The analysis of the interview data was carried out using the headings from the interview guide as a structure.

The qualitative data analysis was not analysed and presented separately for the three rehabilitation centres through which the individuals interviewed were sampled. As the data analysis progressed, it became clear to the researcher that the themes emerging from the interviews did not reflect which rehabilitation centre the individual was referred to.

As stated, it was not the intention within this study to compare data from the three centres, and a comparison of these qualitative results was not appropriate as a rigorous research method.

Qualitative Data Analysis

What information were you given about the rehabilitation service?

The majority of those interviewed (n=38) were aware of what was involved in the cardiac rehabilitation programme, such as the mixture of education and exercise and the venue. However, several of those interviewed (n=20) seemed unaware of the potential long-term benefits of being involved, such as changing their health behaviour.

> *I know it's a mixture of exercise and information and that it's optional…that's it really* (female, 71, suffered a myocardial infarction).

> *It's not like you know getting treatment is it? I turned up for all that you know needles and recordings and everything* (male, 56, suffered a myocardial infarction).

What was the reason for your referral to the cardiac rehabilitation service?

All the individuals interviewed were aware of their diagnosis when given the opportunity to describe their problems in detail.

Do you feel you were given enough information about the rehabilitation programme?

All the individuals interviewed felt that they had been given enough information regarding phase three of the rehabilitation programme. However, responses to the first area within the interview guide (What information were you given about the rehabilitation service?) indicated that interviewees were unaware, or not acknowledging within the interview, the potential long-term benefits of attending and changing their behaviour. One of the individuals interviewed mentioned that the rehabilitation programme was intended to stop them becoming ill again.

Did you attend any of the sessions? (If yes, then how many?)

Four of the individuals interviewed had attended one of the sessions and no more. On considering the records within each centre, it became clear that this was a small number of individuals. For instance, in the previous 12 months in the Bournemouth programme, out of 230 individuals who opted to attend cardiac rehabilitation, five started attending and then dropped out *for no stated reason*, with similar numbers in the other centres. The vast majority of those who stopped attending during the programme did so because of illness, either cardiac in origin or due to other chronic health problems or self-limiting short-term infections.

Three stopped attending due to transport problems, with one individual who tried to attend the programme in January 2003 experiencing particular problems.

> *Well the journey* [from New Milton] *took two hours each way…and cost £10 for my wife and myself…it was very cold and just too much altogether really* (male, 68, suffered a myocardial infarction).

What is the distance from your home to the venue, approximately?
The shortest distance for one individual interviewed was within 20 minutes walk of the venue for cardiac rehabilitation. When interviewed, she stated:

> *I didn't really want to go, I feel too old for something like that, I would be ashamed of my old body and everything…you need to be young for that* (female, 79, suffered a myocardial infarction).

All other interviewees lived more than four miles from their rehabilitation centre with the maximum distance of anyone interviewed from the venue being 27 miles. The majority of interviewees lived between 10 and 15 miles away (n=28).

Did the distance from your home to the venue affect your decision to attend in any way?
The most common theme emerging from the interviews was lack of transport (for n=24 individuals it was stated as the main reason), or finance to pay for transport. Due to the distance from the venue and perceived lack of public transport, this issue was perceived by interviewees to be problematic.

> *I was given the information but I cannot drive and I am on benefits so I could not afford the £10 for the transport. Altogether, to go would have cost me £120 (*female, 49, post cardiac surgery).

Some individuals stated that they were dependent on others for transport and felt that this limited their ability to attend (n=8).

> *Very difficult for her to bring me really, she is worried about money…husband's gone you know, I can't help, she has two little ones then I get ill you know, I didn't like to ask really* (male, 78, post cardiac surgery dependent on daughter for transport).

Following their illness, it also became clear that some individuals (n=6) feel less confident to travel, either driving or on public transport, and that this may affect how they feel about the cardiac rehabilitation programme.

> *I don't feel confident you know* [about driving] *and I am getting on you know. I was not clear about whether it would do me any good really, you know at my age* (male, 80, suffered a myocardial infarction).

Other individuals were not able to drive for health reasons (other than the limitations placed on them by their cardiac problems), such as poor sight or epilepsy. However, one individual, who lives 27 miles from her rehabilitation programme, stated:

> *Well you know that's for people with cars really isn't it, I couldn't go…not from here* (female, 71, suffered a myocardial infarction).

Did the time of day at which the programme was run affect your ability to attend in any way?

Ten individuals interviewed stated that they felt they could not attend the cardiac rehabilitation programme as recommended due to work commitments and, in sharing this information, gave insights into how they felt about the rehabilitation programme overall.

> *I am self-employed and so you know I needed to get back to it really. I didn't need to hear loads more about it you know, really depressing at the time. I try to forget it so I don't worry, we need the money you know* (male, 56, following PTCA/Stent).

> *Well I went back to work pretty quick, actually I don't think it would make much difference to me, I need the money…* (male, 56, following a myocardial infarction).

> *The wife can drive you know, I had to change my job* [due to two myocardial infarctions] *so she has to work, the hours we both do…we could not do it* (male, 54, suffered two myocardial infarctions).

Would you have liked your partner or carer to attend with you? Did whether they were going to attend influence whether you could attend?

As already mentioned, some individuals interviewed needed to rely on relatives/friends for transport to the venue. However, in addition, through discussing this area, six individuals stated that they could not attend due to their caring commitments, either relating to partners or parents.

> *My wife, she gets confused I could not attend with her really and there is no-one else to look after her, I would worry, I can't leave her really she gets upset…it's very difficult* (male, 84, following myocardial infarction).

> *She needs someone pretty much all the time…dementia…she does not really understand and hated the respite* [where she was] *when I had the surgery* (male, 71, post cardiac surgery).

Are there any things that you think would have helped you to attend?

The comments from interviewees relating to this area focused on issues already covered within other areas in the interview. Transport problems, including financing the journey, work commitments (either their own or the individual's they rely on for transport), and caring commitments. Two of those interviewed mentioned parking problems in particular.

> *I have lost my confidence driving you know with all this sickness…and when I turned up and could not park anywhere…it made me feel worried, I thought I might get the pain again. It was cold you know and if I had to walk a long way…* (female, 73, suffered a myocardial infarction).

> *If they could have offered transport for that* [cardiac rehabilitation] *you have just been through a traumatic experience…with the attack and finding out I was diabetic…I was going monthly really, with all the appointments, it's expensive each time…so I stopped* (male, 74, suffered a myocardial infarction).

Do you normally do any form of regular exercise? (If so then what, for how long, how often?)

Some of those interviewed (n=13) stated that they had reviewed the exercise they were doing with their GP and agreed with them that they were taking adequate exercise regularly.

> *I just wanted to talk to my GP. He knows me best he has been around for years* (male, 80, following a myocardial infarction).

All 13 either exercised alone or with friends by doing sporting activities such as swimming and golf, but most commonly, walking. These individuals undertook some exercise each day for at least 30 minutes. None of those interviewed undertook exercise in a gym or fitness centre. Therefore, the majority of those interviewed who declined cardiac rehabilitation were not taking any form of regular exercise. Those who

were working stated that they felt they were active, as their work involved some exercise, most commonly walking. Some of the women interviewed (n=5) felt that they kept active through undertaking the housework at home, although they were aware that housework was not recognised as adequate exercise in relation to their heart health.

> *I do the housework and then I am whacked you know, they say that does not count but it's all I feel like doing, and all I have ever done really* (female, 73, following a myocardial infarction).

Are there any other comments that you would like to make regarding the cardiac rehabilitation programme?

Overall, comments regarding the programme were very positive regarding the information that had been given; no one who was interviewed felt that they had not been given the information they needed. However, some statements made showed misconceptions about the cardiac rehabilitation process:

> *I think it's lifting weights mainly isn't it?* (female, 71, following cardiac surgery).

Others felt that the information they had been given had not helped them to attend due to their circumstances at the time.

> *Yeah,* [I had been given] *enough to know I did not want to have that to worry about as well as work and money* (male, 56, following a PTCA Stent).

Some of those interviewed (n=7) stated that they did not enjoy group activities and that they had been put off undertaking rehabilitation because of this.

> *I don't like groups, the wife says I'm unsociable*…[I have] *never really exercised, bit late now* (male, 72, following a myocardial infarction).

Several of the women interviewed (n=8) stated that they felt the exercise part of the rehabilitation programme was not for them.

> *I'm sure it's OK for when you're young and for the men you know* (female, 88, following myocardial infarction).

> *Well I did not really fancy it. I am not good at group things and I am very old now* (female, 90, following a myocardial infarction).

Several of those interviewed (n=7) stated that they had changed their habits following their illness, with three stating that they had stopped smoking and four saying that they had changed their dietary habits. On further exploration, the interviewees stated that they found the information they received on these areas while in hospital helpful. The three who successfully stopped smoking had all received further support from their GP and/or practice nurse.

Nine of the individuals who opted to attend the exercise advice group (Poole) were interviewed. The same areas were discussed as outlined within the interview guide, and their responses overall have been integrated within this qualitative analysis, relating, as it does, to declining phase three cardiac rehabilitation. This group did, however, offer generally positive feed back regarding the advice group, with increases in awareness of the importance of exercise being reported. One of the nine had given up smoking since their illness (for a period of two months, at the time of interview) with the support of their practice nurse.

Key Findings

In summary, the key findings from this study are:

- Age and gender appear to influence whether an individual opts to do cardiac rehabilitation or declines. Qualitative results suggest that an individual's view of their own suitability for rehabilitation, and their confidence regarding travel, along with other practical issues regarding attendance, may influence these results.

- The significance of this influence is greater in rural areas. Qualitative results would suggest that problems with distance/transport to rehabilitation programmes might affect these results.

- Individuals are aware of their diagnosis, but may not be aware, or may not acknowledge, the potential long-term benefits of attending rehabilitation and changing their health behaviour.

Discussion

The finding that interviewees did not attend at least in part because of financial constraints does not concur with a recent study carried out in Glasgow (Clark, 2002). This study found that, through undertaking focus groups with individuals who had not attended cardiac rehabilitation, the main issues the groups raised focused on inaccurate information-giving by healthcare professionals, and individual's opinions of the relevance of cardiac rehabilitation. The results of this Scottish-based study indicate that practical problems were rare among non-attenders. However, these differences in results may, in part, be explained through the research techniques used, and the distance between where individuals lived and the rehabilitation venue. It has been suggested that, in some instances, individuals involved in focus groups are less likely to share information regarding their own financial and personal situation than those interviewed on a one-to-one basis (Laws et al., 2003). The finding that individuals do not attend cardiac rehabilitation programmes due to problems with transport does concur with other studies, which have focused on factors that may affect attendance at programmes based within mixed urban and rural areas (Grimwood, 1996; Schulz, 2000).

No patients are currently excluded from cardiac rehabilitation due to their age in the three cardiac rehabilitation centres included in this study. From current evidence relating to the benefits of cardiac rehabilitation for all age groups, this would appear to be the most appropriate approach (Willmer et al., 1999; Lavie et al., 1995). However, it would appear from the data analysis in this study that individuals may exclude themselves in relation to their age as they may see themselves as 'too old' to participate. Health care professionals may explain the possible benefits of cardiac rehabilitation while giving information regarding the programme. However, if individuals see themselves as inappropriate for rehabilitation, and such views are compounded by other factors (as suggested within the interview data in this study), such as an unwillingness to join in with groups, not having transport readily available or suffering with other chronic health problems, then the likelihood of attendance for an individual may still be small.

The finding that the majority of those interviewed were aware of the details of their diagnosis is a positive outcome of this study. A recent study focusing on women showed that, when interviewed following their myocardial infarction, they were unaware (post discharge from hospital) of their diagnosis (Rushton, 2002). This result can therefore be viewed as a positive outcome relating to information giving and enabling the

retention of information within all three cardiac and cardiac rehabilitation services.

The 10 individuals who did not attend cardiac rehabilitation due to work pressures were mainly self-employed (n=8), and all were under 60 years of age. Two of these individuals expressed views which appear to indicate that they were trying to forget or deny their illness due to other pressures in their life. Through the interviews, it was difficult to ascertain whether another type of programme would have enabled them to attend cardiac rehabilitation, or achieve lasting lifestyle change, without further support in relation to understanding their illness.

Conclusions and Recommendations

When interpreting these results, it is important to remember that the interviews with individuals did raise issues relating to how people view their own illness and their own suitability for cardiac rehabilitation. Whether they wish to face up to their diagnosis and deal with potential changes in lifestyle appeared as an important issue for younger individuals. For older people, how they viewed themselves, particularly in relation to age and attending cardiac rehabilitation, and whether they excluded themselves due to their age, were important issues and relevant to the choices they made.

It was not the intention within this study to compare the different centres providing cardiac rehabilitation as there are some differences between their provision of the service. The statistical findings have been presented individually to provide further detailed information on the four variables for the areas where they are significant, rather than to compare. The rehabilitation programme which serves the more rural areas in Dorset shows significant findings in relation to age and gender, and their influence over attendance when complemented by the qualitative results is not unexpected. A study carried out in Australia, which had attendance rates of 20-35% in rural areas (Schulz & McBurney, 2000), suggested that living a distance of more than 27kms from the rehabilitation provision meant that individuals were less likely to attend. The results from this study would indicate that, within an international context, the rehabilitation service in rural Dorset is achieving a reasonable attendance despite its mainly rural population.

It is necessary when considering these results to frame the findings as layers of influence over whether or not an individual attends cardiac rehabilitation. An individual's own thoughts and feelings regarding the benefits of rehabilitation are important and appear potentially different for different groups. However, when these are complemented by lack of confidence regarding travel, and difficulty in paying for transport, they may increase the likelihood of non-attendance. Strategies to deal with the areas arising through this study need to develop from the premise that opting in to phase three cardiac rehabilitation, or independent lifestyle changes, need to be made easier/simpler options for those who currently opt out of the service. It may be that, if service developments are undertaken with the active involvement of service users at a strategic as well as at a local level, some practical issues could be better addressed.

The findings from this study would suggest, therefore, that the following factors might have enabled greater take up:

- the provision of free transport to phase three rehabilitation;
- the reiteration of the potential long-term benefits of attending rehabilitation;
- enabling individuals to undertake exercise at home, fitting into their daily routine or locally, with support in terms of information and/or staff.

Limitations of this study

This study would have benefited from the consideration of whole, or part, of the second section of postcodes within the quantitative data analysis. This would have allowed more sensitivity regarding the analysis of different groups within each postcode area. Gaining ethical approval for collection of whole postcode data would require a specific application and a separate study design.

Further resources for this study would have allowed for an analysis of patient notes relating to gaining insight into whether smokers and those suffering from their first myocardial infarction are less likely to attend cardiac rehabilitation in Dorset.

Implications for further research

An evaluation of the Poole exercise advice group in relation to influencing behaviour change, as compared with phase three cardiac rehabilitation, may provide useful insights into planning future services, particularly for older age groups. Effective evaluation of locally based cardiac rehabilitation provision may also provide insights into further developments, as may the evaluation of lifestyle change programmes supported by primary care staff.

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Appendix 1

Proposal for Stage 1 as presented to the Ethics Committee, February 2002

(Study to run from Oct 2001-April 2003. Commissioned by Healthworks. Researcher: Ann Hemingway.)

Aim of the study

This study will consider factors that may influence the uptake of phase three cardiac rehabilitation in three centres offering these services in Dorset (based in Bournemouth, Poole and Dorchester).

Objectives of the study

- to review current knowledge on the issue of attendance at cardiac rehabilitation and structure the analysis appropriately;
- to consider the practical issues of the rehabilitation centres database record keeping when planning and conducting the study;
- to compare attenders and non-attenders at the three individual cardiac rehabilitation programmes;
- to gain insights into why an individual may not attend cardiac rehabilitation services as recommended, through interviews.

The service provision for cardiac rehabilitation in all three centres is linked to the acute cardiac services within the three local acute Trusts. Nationally cardiac rehabilitation services are developed for those with established heart disease, especially those who have suffered an acute myocardial infarction or those who have undergone cardiac surgery. The overall aim of rehabilitation programmes is to facilitate physical, psychological and emotional recovery and to enable achievement of a healthy lifestyle. Cardiac rehabilitation services across the three areas aim to achieve these benefits through a combination of exercise, education, or referral for those with psychological sequelae.

The literature on this area

In relation to uptake of cardiac rehabilitation, current knowledge would suggest uptake rates relate mainly to either ‘service’ or ‘patient’ factors (NHS Centre for Reviews 1998). The service factors tend to focus on the ‘invitation’ to participate and logistical issues such as the availability and accessibility of services, whereas patient factors may relate to individual circumstances and motivation.

Uptake following invitation to rehabilitation is lower in women of all ages and in the elderly across both genders (McGee & Horgan, 1992; Radley et al., 1996; Pell et al., 1996; Ades et al., 1992). This may be connected

to the individuals' feelings that it would be inappropriate for them to attend, or that they would feel awkward and out of place (Campbell et al., 1994).

Other possible reasons for not taking up the service are wrong or inadequate information or individual lack of motivation. Smokers and those suffering a first myocardial infarction have been shown to be less motivated to attend (Levy, 1993).

Socio-demographic factors that may affect attendance at cardiac rehabilitation include level of education, partner involvement and deprivation, which seem to be significant predictors of uptake (Pell et al., 1996; Ades et al., 1992).

Within the NHS Centre for Reviews and Dissemination Report (1998) on cardiac rehabilitation services, the recommendation was made that further research needed to identify reasons for, and strategies to improve, the current levels of uptake in the groups discussed here.

Method

The first stage of the study is examining data relating to attenders *and* non-attenders at stage three (out-patient rehabilitation sessions) cardiac rehabilitation. This is going to be done for the three centres over a 12-month period in retrospect. Attenders and non-attenders are classified according to the standard protocols used at each rehabilitation programme. There is no intention to compare data between centres and all data is treated as discreet and pertaining to its originating centre only.

Data for Stage 1 of the study will be accessed from the computerised records by the researcher. These records are currently routinely collected by rehabilitation staff. From the computer software programmes used by the rehabilitation programmes, it is possible to extract anonymous data pertaining to the following areas: gender, age, postcode (first section only) and presenting problem, of both attenders and non-attenders. No additional record keeping or record retrieval is required of the rehabilitation staff. The data needed is to be extracted by the researcher from existing data.

Data will therefore be analysed for both attenders and non-attenders in relation to the following variables:

- gender (nominal data);
- age (distributive data);
- postcode (nominal data);
- cardiac disorder (nominal data) through which they qualify for cardiac rehabilitation.

The first stage of the study will take place between March 2002 and August 2002, with the second stage taking place from September 2002 to March 2003.

The second stage

The second stage of the study will consist of structured taped interviews. All individuals who do not complete cardiac rehabilitation as recommended will be written to and asked for an interview for a six month period. All individuals who are too unwell to attend the rehabilitation programme will be excluded from the sample (currently the rehabilitation programme staff record whether individuals are well enough to access rehabilitation on their rehabilitation records).

Ethical issues

Ethical approval has been applied for separately for Stage 1 and Stage 2 of the study. This was necessary as the exact focus of the interview structure for Stage 2 was not known until the commencement of Stage 1 of the study.

All data regarding attendance or non-attendance at cardiac rehabilitation programmes will be stored on the password protected Bournemouth University internal network by the researcher (Ann Hemingway, Practice Development Fellow, Public Health, Institute of Health and Community Studies, Bournemouth University). This data will be destroyed on completion of the study.

Relevance for rehabilitation services

The study should prove relevant locally in relation to groups who are less likely to attend, and should help inform future planning of rehabilitation services. The results of the study will also provide useful insights into 'service' factors, such as the location, timing and organisation of services. Additionally, with regard to 'patient' factors, these insights may include the perception of services and support factors, which may enable increased uptake.

Appendix 2

Protocol Amendment SW/RCH/LREC 143/01/B (February 2002)

This three-site study gained ethical approval in February 2002, and the researcher has successfully gained the spreadsheet information required for analysis from the cardiac rehabilitation services at West Dorset General Hospitals NHS Trust.

However, the rehabilitation services at both Poole Hospital NHS Trust and the Royal Bournemouth and Christchurch Hospitals NHS Trust have experienced problems with their database records since February 2002. Therefore, the researcher has been unable to access the anonymous information on a spreadsheet as required for the data analysis laid down within the previous LREC application, relating to information regarding attendance and non-attendance at cardiac rehabilitation programmes.

The protocol amendment proposed therefore consists of the following:
The researcher will look at the rehabilitation programme registers in the rehabilitation office in order to gain information on who has completed or not completed the rehabilitation programme in the previous twelve months.

Still within the rehabilitation programme office, the researcher will then match this information by hand with the demographic information required for data analysis, on a hard copy spreadsheet. This demographic information will be gained for each individual patient from the rehabilitation programme computerised record, which holds these details but not information on whether the individual has completed rehabilitation as recommended.

This demographic information will consist of the first stage of postcode, gender, presenting problem and age, which will be matched with whether that individual completed cardiac rehabilitation. This information on the spreadsheet will not include a name, whole postcode or hospital number, and *only when anonymous* will it be taken from the rehabilitation office to Bournemouth University for analysis, as within the approved protocol.

When produced for analysis, the spreadsheet will therefore include the following information only, and it will be produced within the rehabilitation office.

Age	First section of postcode	Presenting problem	Gender	Completed cardiac rehab programme
70	BH1	AMI	Male	No

In conclusion, the information required, rather than being provided in the form of an anonymous spreadsheet, will be placed into a spreadsheet format by the researcher. This will be done using the demographic data that is available currently on the rehabilitation database and the hand written registers used by the rehabilitation staff.

This amendment has been discussed with the Caldicott leads in both Trusts, Anne Gayle at the Royal Bournemouth and Christchurch Hospitals NHS Trust, and Richard Hatton at the Poole Hospital NHS Trust, both of whom have expressed no reservations regarding this procedural change. Many thanks for giving this matter your kind consideration.

Appendix 3

Proposal for Stage 2, June 2002

(Study to run from Oct 2001-April 2003. Commissioned by Healthworks. Researcher: Ann Hemingway)

Aim of the study

This study will consider factors that may influence the uptake of cardiac rehabilitation in three centres offering these services in Dorset (based in Bournemouth, Poole and Dorchester).

Objectives of the study

- To compare attenders and non-attenders at the three individual cardiac rehabilitation programmes (Stage 1: ethical approval was gained in January 2002 for this stage);
- To review current knowledge on the issue of attendance at cardiac rehabilitation and structure the analysis appropriately;
- To gain insights into why an individual may not attend cardiac rehabilitation services as recommended (Stage 2, on which this application to the ethics committee is focused).

The service provision for cardiac rehabilitation in all three centres is linked to the acute cardiac services within the three local acute Trusts. Nationally, cardiac rehabilitation services are developed for those with established heart disease, especially those who have suffered an acute myocardial infarction or those who have undergone cardiac surgery. The overall aim of rehabilitation programmes is to facilitate physical, psychological and emotional recovery and to enable achievement of a healthy lifestyle. Cardiac rehabilitation services across the three areas aim to achieve these benefits through a combination of exercise, education, or referral for those with psychological sequelae.

The literature on this area

In relation to uptake of cardiac rehabilitation, current knowledge would suggest uptake rates relate mainly to either ‘service’ or ‘patient’ factors (NHS Centre for Reviews 1998). The service factors tend to focus on the ‘invitation’ to participate and logistical issues such as the availability and accessibility of services, whereas patient factors may relate to individual circumstances and motivation.

Uptake following invitation to rehabilitation is lower in women of all ages and in the elderly across both genders (McGee & Horgan, 1992; Radley et al., 1996; Pell et al., 1996; Ades et al., 1992). This may be connected to the individuals’ feelings that it would be inappropriate for them to attend, or that they would feel awkward and out of place (Campbell et al.,

1994). Other possible reasons for not taking up the service are wrong or inadequate information or individual lack of motivation. Smokers and those suffering a first myocardial infarction have been shown to be less motivated to attend (Levy, 1993).

Socio-demographic factors that may affect attendance at cardiac rehabilitation include level of education, partner involvement and deprivation, which seem to be significant predictors of uptake (Pell et al., 1996; Ades et al., 1992).

Within the NHS Centre for Reviews and Dissemination Report (1998) on cardiac rehabilitation services, recommendation was made that further research needed to identify reasons for, and strategies to improve, the current levels of uptake in the groups discussed here.

Methodology

The first stage of the study is examining data relating to attenders *and* non-attenders at stage three (out-patient rehabilitation sessions) cardiac rehabilitation. After gaining ethical approval for this stage of the study in January 2002, this analysis is currently being undertaken for the three centres over a 12-month period in retrospect.

The second stage of the study, on which this proposal for the ethics committee focuses, will gain insights into why individual patients do not attend cardiac rehabilitation programmes as recommended. All individuals who do not complete cardiac rehabilitation as recommended will be written to and asked for permission to approach them for a telephone interview over a six-month period. The interviews will be taped, and will not exceed 20 minutes in length. All individuals who are too unwell to attend the rehabilitation programme will be excluded from the sample (currently the rehabilitation programme staff record whether individuals are well enough to access rehabilitation on their rehabilitation records). The patients' notes will not be accessed for information; the researcher will access the registers maintained by the rehabilitation staff for information regarding whether patients have attended rehabilitation services. No individuals will be approached who are considered too unwell to attend cardiac rehabilitation.

The researcher will take notes to record the interviewee responses during the interview, and these will be analysed to look for common themes arising using the areas outlined within the interview guide to structure the analysis and present the findings. Each interviewee will be informed prior to the interview that the interviewer will be taking notes.

It is the individual's right to decide not to attend cardiac rehabilitation and it is not the intention of this study to attempt to coerce patients to attend

against their wishes. It is the intention of this study to gain insights into structural issues which may lessen the likelihood of individuals attending. These may include transport, timing, or venue for the programme. This focus is made clear in the letters to the patients asking for their permission to include them in the study, and in the information sheet.

Each individual patient will be written to and asked for permission to telephone them for an interview – a proposed date and time will be included on the letter. For those individuals aged under 65, this time will be between 6 and 7pm on a set day. For those individuals aged over 65, this time will be between 1 and 2pm on a set day. If these suggested times are inconvenient, then alternative arrangements will be made depending on the individual's preference (see enclosed patient letter).

It is proposed that the second stage of the study will take place from September/October 2002 to March 2003.

Ethical issues for Stage 2 of the study

No patient names will be stored, either on hard copy or on the computer system at Bournemouth University. The researcher will collect the names on a monthly basis of those that have not attended or not completed cardiac rehabilitation. They will then be written to individually to ask their permission to approach them for telephone interview. Copies of these letters will not be saved electronically on the university computer system. Each individual will be allocated a code number relating to their age and gender on being written to, and the notes from their interview will be labelled with this code number. The individual's name and telephone number will be destroyed following the interview; in the interim their name and telephone number only will be stored within a locked cupboard at Bournemouth University.

These interviews will focus on external factors that may have affected the patient's decision to attend cardiac rehabilitation and this is made clear in the information sheet and the letter to the patients. It is not the intention of the researcher to coerce the patient to attend or to make them feel guilty – the research is intended purely to gain their insights into factors that may limit the likelihood of them attending.

Relevance for rehabilitation services

The study should prove relevant locally in relation to groups that are less likely to attend, and should help inform future planning of rehabilitation services. The results of the study will also provide useful insights into 'service' factors, such as the location, timing and organisation of services. Additionally, with regard to 'patient' factors, these insights may include the perception of services and support factors, which may enable increased uptake.

Appendix 4

Telephone Interview Guide

Interviewer instructions

- Introduce yourself.
- Check receipt of letter, information sheet, and questionnaire.
- Check that this time is acceptable to conduct the interview – it will last for no longer than 20 minutes. If not, make an alternative arrangement.
- Check consent to be interviewed, and understanding of interview focus.
- Check that the interviewee is aware that the interviewer may make notes during the interview.

Interview questions

- What information were you given about the rehabilitation service?
- What was the reason for your referral to the cardiac rehabilitation service?
- Do you feel you were given enough information about the rehabilitation programme?
- Did you attend any of the sessions? (If yes then how many?)
- What is the distance from your home to the venue approximately?
- Did the distance from your home to the venue affect your decision to attend in any way?
- Did the venue in which the programme was to be held influence whether you attended in any way?
- Did the time of day at which the programme was run affect your ability to attend in any way?
- Would you have liked your partner or carer to attend with you?
- Did whether they were going to attend influence whether you could attend?
- Are there any things that you think would have helped you to attend?
- Do you normally do any form of regular exercise? (If so then what, for how long, how often?)
- Are there any other comments that you would like to make regarding the cardiac rehabilitation programme?

Thank you very much for consenting to this interview, your comments are very valuable.

Appendix 5

Letter to Participants

I am contacting you in relation to a research study which is being undertaken by Bournemouth University in partnership with your local cardiac rehabilitation programme. This study is being undertaken to inform the organisation and planning of cardiac rehabilitation programmes.

My name is Ann Hemingway and I am the researcher undertaking the study. I would like to request a telephone interview with you to discuss your local cardiac rehabilitation programme. The decision whether to attend a cardiac rehabilitation programme is yours to make, and I respect your right not to attend. This interview will not ask you to explain or justify your decision; it is designed to consider whether there are any factors which may stop you attending, such as transport, timing, venue or relevance for you. All patients who have not completed the rehabilitation programme are being asked for an interview to inform this study. Please find enclosed an information sheet regarding the study, the questions to be covered, and contact details for me, the researcher.

If you fill out the slip below giving your permission I will telephone you between … and … pm on … to undertake the interview which will be no more than 20 minutes in duration. Please tick appropriately below to either give your permission for the interview at the date and time already stated, or to give your permission and a suggested date and time to rearrange the interview, and sign and return the slip in the enclosed stamped addressed envelope. **If I do not receive a slip from you giving your permission then you will not be telephoned for an interview**. Thank you for giving this matter your kind attention.

Yours sincerely,
ANN HEMINGWAY

(Please tick as appropriate)

- I give my permission to be telephoned for an interview at the date and time given on my letter _____
- I give my permission to be telephoned to rearrange an interview date and time. The best date and time to telephone me to reorganise this is _____

Please print your name _____

Appendix 6

Information Sheet

My name is Ann Hemingway (Practice Development Fellow, Public Health, Institute of Health and Community Studies, Bournemouth University) and I am the researcher undertaking this research study which has been commissioned by Healthworks.

You are being invited to take part in a research study. However, before you take part, it is important that you understand why the study is being undertaken and whether you wish to take part.

About the study

The decision whether to attend a cardiac rehabilitation programme is yours to make. This study is designed to consider the factors which may stop someone attending. These factors may include problems with transport, the timing of the programme sessions, the venue, or your understanding of the programme itself.

Will my taking part in the study be confidential?

If you agree to participate in the study you will be interviewed for a maximum of 20 minutes over the phone and the interviewer will make notes of your responses. Your identity will be known only to the researcher, and all contributions you make to the study will be anonymous. The interview notes will be destroyed by the interviewer after the study is completed and will not be labelled with your name.

Do I have to take part?

You are free to say you do not wish to participate at any time.

What will happen to the results of the research study?

Following data analysis, the findings of the study will in the first case be made known to all healthcare professionals involved, and the Dorset Healthy Hearts Campaign Steering Group, prior to general dissemination.

What will happen now?

Please return the slip at the bottom of the covering letter in the enclosed stamped addressed envelope if you agree to be interviewed to inform this study, or you agree to being contacted to reorganise the date and time of the interview. You will be telephoned for an interview at the pre-set time outlined in the covering letter only if I receive your slip giving your permission by the date on the covering letter.

What will happen in the interview?

You will be asked about factors that may have affected your ability to attend the cardiac rehabilitation programme. Please find attached here a copy of the interview questions for your reference.

Whom do I contact for more information regarding the study?

You can contact me, the researcher, Ann Hemingway on 01202 xxxxxx.

Thank you for giving this matter your kind attention.

Appendix 7

Logistical Regression for Area 3

Variables	Significance
Age	.002
Gender	.002
Cardiac problem	.004
Overall statistics	.000