

ORIGINAL ARTICLE

Increasing attendance at a cardiac rehabilitation programme: an intervention study using the Theory of Planned Behaviour

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SUMMARY. Now that cardiac rehabilitation (CR) has been shown to be an efficient and effective use of resources, resulting in reduced mortality and morbidity, it is essential that as many people as possible are given the opportunity to benefit from it. But, despite proven benefits, uptake of services can be low. The aim of this research was to develop and implement a psychological intervention to influence patients' beliefs about recovery and cardiac rehabilitation, in order to increase their attendance rates at a CR programme. The intervention was based on the Theory of Planned Behaviour and took the form of two letters given to patients post myocardial infarction ($n = 87$). Using a randomized control trial design, attendance rates for those patients who received the intervention letters were compared with patients in a control group who received nominal letters. Attendance rates for the experimental group were significantly higher than those in the control group ($P < 0.0025$). This study shows that an intervention in the form of two letters given to patients can increase the number of people who attend a cardiac rehabilitation programme. © 2001 Harcourt Publishers Ltd

INTRODUCTION

Cardiac rehabilitation (CR) is of proven benefit to people who have suffered a myocardial infarction, resulting in reduced morbidity and mortality (e.g. Dusseldorp et al. 1999, Linden et al. 1996, Heller et al. 1993, Oldridge et al. 1988). In England and Wales the National Service Framework for Coronary Heart Disease (Department of Health 2000) states that all people admitted to hospital suffering from coronary heart disease (CHD) should be invited to participate in a cardiac rehabilitation programme. But despite benefits of reduced morbidity and mortality, and government recommendations, uptake of services can be low (King & Teo 1998) with some studies showing only 21% of patients attending a programme (Ades et al. 1992).

With attendance rates so low, the next step has been to identify factors which influence attendance (King & Teo 1998). Some patients simply are not referred to CR, with

women and older people being less likely to be referred (e.g. Lieberman et al. 1998, Ades et al. 1992) indicative of gender and age bias. Most common reasons for non-referral include medical reasons such as lack of mobility, unstable angina and being over 75 years of age (Pell & Morrison 1998). Encouragingly, Schulz and McBurney (2000) found that 73.4% of MI patients were referred to a CR programme. However, King et al. (1999) reported referral rates as low as 23.9%.

For those referred, socio-demographic factors appear to predict attendance, with non-attenders being more likely to be socially deprived, older, living further away from the programme, living alone and not having access to public transport, than attenders (e.g. Schulz & McBurney 2000, Pell & Morrison 1998). These research findings present a challenge to service providers to respond creatively in the way CR services are provided, so that all people, regardless of where or how they live, are able to benefit from CR.

Given that sociodemographic and medical factors influence attendance, recent research has focused on investigating the role of factors which may be more amenable to change (Cooper et al. 1999, Johnston et al. 1999). These studies have found that psychological factors, such as the way a patient understands their illness, influence attendance. Psychological models such as the Theory

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of Planned Behaviour (TPB) developed by Ajzen and colleagues (Ajzen 1985) and Leventhal's self-regulatory model (Leventhal et al. 1980) have been used to guide this research. The Theory of Planned Behavior (Ajzen 1985; Ajzen & Madden 1986), suggests that the most important influence on a person's behaviour is their behavioural intention, that is, what they intend to do.

Behavioural intention is influenced by:

- attitude towards performing the behaviour;
- perceived subjective social norms (perceived social pressure), i.e. the degree to which the person thinks significant others (e.g. nurses and doctors) feel performing this behaviour is important;
- perceived behavioural control: the degree to which a person feels that performing a behaviour is under his control.

As well as perceived behavioural control predicting intention, it also has a direct effect on the behaviour.

Hence, by influencing a person's attitude, perceived subjective social norm and behavioural control, we might be able to influence a person's behaviour in a way that could be health-enhancing. The TPB has been used to predict a variety of health-related behaviours, for example attendance for breast screening (Rutter 2000), testicular self-examination (Brubaker & Wickersham 1990), intentions to take hormone replacement therapy (Quine & Rubin 1997), dietary behaviours (Conner et al. 1996; Povey et al. 2000), exercise (Terry & O'Leary 1995) and drug compliance (Hounsa et al. 1993).

A recent application of the TPB has shown that the theory was also able to predict attendance at CR programmes in two settings, in Gloucester and in Southampton. Johnston et al. (1999) found that those who attended had a stronger belief in family and friends wanting them to attend (subjective norm) ($P < 0.001$), and in the health professionals, recommendation to attend (subjective norm) ($P < 0.001$). They foresaw fewer barriers to attending (perceived behavioural control) ($P < 0.001$) and perceived CR as beneficial to their health (attitude) ($P < 0.001$). Attenders were also more confident that attendance would help with initiating lifestyle change (attitude) ($P < 0.001$) and promote adherence to medical advice (attitude) ($P < 0.001$). They also were more likely to perceive the programme as helping them to reduce their risk of a further heart attack (attitude) ($P < 0.001$). Further, applying the TPB in the Southampton heart integrated project (SHIP) (Jolly et al. 1999) demonstrated that attendance at CR was predictable from TPB variables, specifically, perceived behavioural control over engagement in exercise.

To date, the TPB has been used predictively, but rarely to devise interventions (Hardeman et al., submitted, Johnston et al. submitted). However, the TPB has been successful in predicting attendance and the predictor variables are modifiable, unlike demographic predictors. Thus the aim of the present study was to design, implement and evaluate a TPB based intervention in the clinical setting in which it had been predictive.

METHODS

Research sample

A total of 113 people were asked to take part in the research. Informed consent to be studied was sought from all potential participants. Thirteen people declined (response rate 88%), and another 13 were later excluded, with 5 people dying and 8 people developing medical complications, leaving a sample of 87 participants. Forty-three people were randomly assigned to the experimental group and 44 people to the control group. The participants in each group were matched for age, gender and living distance from programme venue (see Table 1).

Materials

Two intervention letters were designed based on the TPB. The letters were intended to influence a person's:

- attitude towards attending the cardiac rehabilitation programme (CRP);
- subjective norm; and
- perceived behavioural control.

According to the TPB model, this would then impact on a person's intention to attend the CRP, which would then impact on their actual attendance, but with a possible intervening effect on perceived behavioural control. How the content of the letters is related to the TPB is shown in Tables 2 and 3.

It should be noted that the behavioural control section was based on Johnston et al. (1992) and incorporates a wider concept of perceived control than the TPB construct. Johnston et al. used the definition of perceived behavioural control from Wallston et al. (1987) as the belief that one can determine one's own internal states and behaviour and influence outcome.

Design and procedure

The study took place between April and December 2000 and was approved by the local NHS Ethics Committee.

Table 1 Age, gender, distance lived from programme and compliance rates for experimental and control groups

	Experimental Group	Control Group	Statistic
Mean age (years)	62.16	63.35	Not significant $t = -0.538$, $df = 60$, $P > 0.328$
Gender			
Male	37	39	Not significant
Female	6	5	$\chi^2 = 0.132$, $P > 0.716$
Mean distance from programme (miles)	6.19	7.67	Not significant $t = -1.15$, $df = 82$, $P > 0.254$
Mean number of sessions attended	5.89	5.82	Not significant $t = 0.15$, $df = 34$, $P > 0.88$

Ethnic group: All participants and potential participants were Caucasian.

Table 2 Theoretical content of intervention letter 1 given to experimental group 3 days post MI

Theory of Planned Behaviour Component	Wording
Introduction	Like many other patients who have had a heart attack, you will shortly be offered a place on a cardiac rehabilitation programme.
Perceived control (after Johnston et al. 1992)	During this programme, you will be offered advice and information about how best to recover after a heart attack. It will be up to you to follow these if you want to recover as well and as quickly as possible. Experience has shown that the more effort you can put in, the more quickly the results will be achieved.
Subjective norm	The medical and nursing professions recommend that people who have had a heart attack should attend a cardiac rehabilitation programme.
Attitude towards the behaviour	This is because those who attend such a programme are more likely to recover sooner and better than those who do not attend. In addition, research has shown that attendance can reduce the chances of dying from another heart attack.
Ending	If you have any questions about cardiac rehabilitation, you will be able to ask the cardiac rehabilitation nurse, when she comes to talk to you about the programme. With best wishes for your recovery.

The design was experimental, involving a randomized control trial with 87 patients admitted to a district hospital for acute myocardial infarction and referred to the CRP. Patients were randomly allocated to one of two groups: experimental and control.

All of those who agreed to take part in the research were handed a sealed envelope containing a nominal letter thanking them for agreeing to take part in the study (see Appendices). Half of the envelopes also contained an intervention letter (see Table 2). If participants received an envelope with both letters, this meant they were allocated to the experimental group, whilst if they received only the nominal letter they were allocated to the control group. The envelopes had been numbered and the contents of each allocated by random number assignment known only to a research assistant. Envelopes were given to participants in numerical order.

The CR nurse then saw all patients for routine assessment and personal invitation to the CRP. The CR nurse was not aware of the group to which the patient had been assigned. However, there was no procedure in place to stop the patient telling the nurse which letter(s) they had received.

A second intervention letter was sent to those in the experimental group who had accepted the offer of CR, three weeks post MI (see Table 3). For those people in the experimental group who declined the offer of a place, a brief second letter was sent wishing them well and informing them that they were still welcome to contact the team (letter 2B, see Appendices). As this group had de-

clined the invitation, it was felt inappropriate to send them a theoretical letter detailing the benefits of CR.

The first letter given to the experimental group was designed to influence acceptance, whilst the second was designed to influence attendance. In addition, the accepters in both experimental and control groups received a non-research letter at home detailing the course with start dates, etc. Table 4 summarizes the letters sent to the participants.

Main outcome measures

Acceptance and attendance figures were collected for participants, and for those who declined to take part in the research study. Those who said yes to the CR nurse and were allocated a place on a CRP were counted as accepters. Attenders were classed as those people who attended the first week of the programme. Compliance rates of all those who attended the CR programme were collected from CRP weekly attendance records held by the CR team.

Statistical analysis

SPSS for Windows (version 9) was used to analyse the categorical data. Acceptance and attendance data were analysed using χ^2 test. Comparison of compliance rates

Table 3 Theoretical content of intervention letter 2A sent to accepters in experimental group 3 weeks post MI

Theory of Planned Behaviour component	Wording
Introduction	Whilst you were an in-patient you accepted a place on the cardiac rehabilitation programme.
Attitude towards the behaviour	As you are probably already aware, attending such a programme is one way to ensure the best possible recovery for yourself.
Subjective norm	In addition, by attending such a programme you will be following the current medical and nursing guidelines and recommendations.
Perceived control	During the programme the specialist team will be on hand to give you advice and information to help you to make informed choices about your rehabilitation.
Ending	In the meantime, if you have any questions please don't hesitate to get in contact with***

Table 4 Comparison of letters sent to experimental and control groups

Time/ Condition	Decision to attend CR			
	Experimental		Control	
	Accept	Decline	Accept	Decline
3 days post MI	Nominal letter Intervention letter 1		Nominal letter	
3 weeks post MI	Intervention letter 2A Standard letter detailing course dates	Intervention letter 2B	Standard letter detailing course dates	

for experimental and control groups was carried out using *t*-tests.

RESULTS

Those in the experimental group were significantly more likely to accept the invitation to attend the CRP than those in the control group ($\chi^2 = 3.097$, $df = 1$, $P < 0.039$) (see Fig. 1). Thirty-seven (86%) of the 43 patients in the experimental group accepted the invitation compared to 31 (70%) of the 44 patients in the control group.

As well as being more likely to accept, those in the experimental group were also significantly more likely to attend the CRP than those in the control group ($\chi^2 = 7.91$, $df = 1$, $P < 0.0025$). Thirty-seven (86%) out of the 43 patients in the experimental group attended the CRP, compared to 26 (59%) out of the 44 patients in the control group.

Of those who accepted the offer of a place, those in the experimental group were significantly more likely to attend the CRP than those in the control group ($\chi^2 = 4.333$, $df = 1$, $P < 0.0185$). Two (5%) of the 37 patients who accepted from the experimental group did not attend, compared to seven (23%) of the 31 patients who accepted from the control group but did not attend.

Three people who had initially declined the offer whilst inpatients later attended the CRP (two from the experimental group and one from the control group). There was no difference in compliance rates between the experimental group and control group, with all participants attending an average six out of seven sessions (see Table 1).

Neither distance lived from the programme nor age predicted attendance with no significant difference between the groups of attenders and non-attenders ($t = -0.045$, $df = 82$, $P > 0.964$ and $t = -1.148$, $df = 68$, $P > 0.255$ respectively). However, gender did predict attendance, with women being less likely to accept ($\chi^2 = 19.103$, $df = 1$, $P < 0.001$) and attend ($\chi^2 = 8.192$, $df = 1$, $P < 0.004$). To test whether the differences in acceptance and attendance among men and women were a function of distance and age, a series of further tests were carried out. However, there was no significant difference in age ($t = 0.769$, $df = 60$, $P > 0.445$) or distance lived from

the programme ($t = -1.291$, $df = 82$, $P > 0.20$) between the gender groups.

DISCUSSION

The results show that it is possible to increase attendance at a CRP by giving patients a letter based on the Theory of Planned Behaviour, before they are offered a place and another before they are due to attend.

The research design used suggests that the effect was not simply the result of receiving a letter, as the control group also received letters 3 days and 3 weeks post MI. However, it should be noted that the 'decliners' in the control group did not receive a second letter.

The findings of this research appear to support previous research findings (Johnston et al. 1999) that the TPB would be a useful framework for designing an intervention to increase attendance at CR. However, it is possible that wording in the intervention letters such as 'research has shown that attendance can reduce the chances of dying from another heart attack' may have acted as a fear message and influenced the result rather than the theoretical basis of the letters.

Given the work of Cooper et al. (1999) and Petrie et al. (1996), an intervention letter based on Leventhal's self-regulatory model looking at illness perceptions of control and cure would make an interesting alternative for future research. A more widely used model, Bandura's Social Cognitive Theory (Bandura 1997), would have concentrated on the enhancement of self-efficacy beliefs. It is also likely that this would be effective with individuals who already wished to attend CR.

The strongest argument in favour of the TPB as a basis for intervention is that it offers a guide to persuading patients to accept the offer of CR in addition to encouraging them to attend after accepting. Thus, it addresses both the enhancement of motivation in those who have not yet decided to attend and the implementation of action in those who have decided to attend. The results suggest that the experimental group gained some benefit from each of the two letters, the first motivating and the second facilitating action.

As found in previous research (McGee & Horgan 1992), when analysing both groups together, there were gender differences in acceptance and attendance rates with women less likely to accept and attend CR. However, there were too few women in this study to carry out sub-group statistical analysis on any gender differences relating to the impact of the intervention. This does, however, highlight the need for future research to focus on interventions specifically targeted at women, given that research suggests that the factors influencing attendance are different for women and men (Tardivel 1998; Benson et al. 1997).

CONCLUSION

Since we know CRPs have been shown to be an effective and efficient use of resources leading to decreased

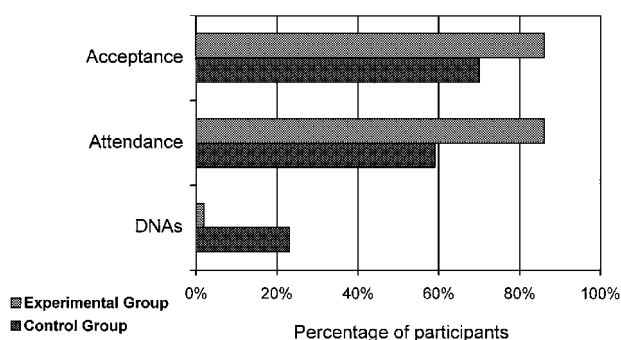


Fig. 1 Acceptance, attendance and 'did not attend' (DNA) rates for experimental and control groups.

mortality and morbidity rates, it is vital that as many people as possible are able to benefit from them. By use of this simple cost-effective intervention based on the Theory of Planned Behaviour, attendance was increased in an optimal way, ensuring efficient use of resources. Hence, this research has implications for those recruiting to CRPs. However, it should be noted that this study was relatively small-scale and so further research needs to be carried out with the intention of replicating these results. This is also an area for further research with the possibility that a similar intervention could optimally increase attendance at other NHS programmes, such as pain management programmes. Given that non-attendance in general outpatient departments costs the NHS millions of pounds each year, further research could investigate the wider applicability of this research.

The Theory of Planned Behaviour provided a useful basis for designing the intervention and the data add to a small body of literature demonstrating the usefulness of the model in developing effective interventions.

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APPENDICES

1. Nominal letter given to all participants

Thank you very much for agreeing to take part in this research project. I will be writing to a random selection of patients in approximately 3 months to ask if they would be willing to take part in a short interview. If you are selected I will write to you then. You are of course free to decline the invitation.

(I would be grateful if you would read the enclosed letter. You will receive a second letter in a few weeks' time.)

If you have any questions or comments, please feel free to contact me on *****

Note: Those in the intervention group received an additional sentence as shown in parenthesis. The short interview was part of a separate but related study (Wyer et al.

2001 elsewhere) asking people 3 months post MI about their decisions concerning attendance at CR.

2. Letter sent to experimental group 'decliners' 3 weeks post MI

Whilst you were an in-patient, you were offered a place on the Cardiac Rehabilitation programme, but decided not to take up the offer. We do know from experience that some people change their mind about attending the programme, when they return home. This letter is just to let you know that if you do change your mind, you are more than welcome to come along to a programme. If there is anything about your recovery or cardiac rehabilitation that you wish to discuss, please feel free to contact *****, the cardiac rehabilitation nurse.

With best wishes, The Cardiac Rehabilitation Team.