Relationship between illness representation and self-efficacy

Margaret Lau-Walker BA PhD RGN RNT PGCEA
European Institute of Health and Medical Sciences, University of Surrey, Guildford, Surrey, UK

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Correspondence:
Margaret Lau-Walker,
European Institute of Health and Medical Sciences,
University of Surrey,
Guildford,
Surrey GU2 7TE,
UK.
E-mail: m.lau-walker@surrey.ac.uk

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Aim. This paper reports a patient survey exploring the possible relationship between illness perception and self-efficacy following a cardiac event, and the implications this could have for nursing practice.

Background. Cardiac rehabilitation guidelines endorse the need to improve psychological care; suggesting that individualized support will improve the effectiveness of cardiac rehabilitation. Surveys, however, continue to identify that psychosocial factors are poorly assessed. Illness representation and self-efficacy are two prominent research approaches that have been developed as separate foci for the treatment of patients.

Method. A cross-sectional survey with patients diagnosed with either myocardial infarction or angina over an 8-month period in two hospitals. The Illness Perception Questionnaire, General Self-Efficacy Questionnaire, Cardiac Diet Self-efficacy Instrument and Cardiac Exercise Self-efficacy Instrument were used, alongside two specifically-designed scales: the Diet Outcome Expectation and Exercise Outcome Expectation Scales.

Results. The results indicate that there is a significant relationship between illness perception and self-efficacy. The greater patients' perceived consequences of the heart condition, the lower was the general self-efficacy available to cope with the condition. Further, the longer the perceived time the condition will affect the patient, the higher the specific self-efficacy to maintain a change of diet or exercise regime.

Conclusion. The findings identify that, in the initial phase of recovery, nursing practice needs to focus on the key variables of 'consequence' and 'timeline' in order to increase patients' confidence in their ability to cope (self-efficacy).

Keywords: cardiac rehabilitation nursing, patient perceptions, illness representation, self-efficacy

Background

In the United Kingdom (UK), the 1995 Cardiac Rehabilitation National Guidelines (Coats *et al.* 1995), 1997 Audit Standards (Thompson *et al.* 1997) and 2002 Scottish Intercollegiate Guidelines Network (SIGN) on cardiac rehabilitation endorse the need to improve psychological care, suggesting that individualized care or support is important for the success cardiac rehabilitation. The UK National Service Framework for Coronary Heart Disease (Department of Health 2000) also recognizes that a multidisciplinary approach which combines exercise, medical, psychological and education interventions is the most effective form of cardiac rehabilitation. Yet, despite this guidance, surveys continue to identify that psychosocial factors are poorly assessed (Lewin *et al.* 1998), and the measurement of psychological and quality of life remains patchy (Bethell *et al.* 2000). The emphasis on the need to individualize care in cardiac rehabilitation stems from the assumption that patients' actions are determined by their

beliefs and expectations, some of which are pre-existing and others are created by what is said and done during treatment. Both the illness representation model and the concept of self-efficacy were recommended in the 1995 National Guidelines (Coats *et al.* 1995) as relevant approaches for developing psychological support that meets the needs of individual patients. Using one or other of these approaches, researchers have generated considerable evidence of the importance of patient beliefs and expectations in recovery, and the need to manage these beliefs if rehabilitation programmes are to become more effective. These two research approaches have been pursued independently, and the relationship between illness perception and self-efficacy has not been explored. If a significant relationship between the two approaches could be established, then a combined understanding of patients' beliefs about their illness and ability to cope with lifestyle changes after a cardiac event would offer a more comprehensive framework for psychological support.

Illness representation

The self-regulatory model (SRM) of illness (Leventhal *et al.* 1984) was formed from empirical data collected in patient interviews. This model is widely used to explain how people interpret and cope with current and potential health events or threats (Petrie & Weinman 1997). Leventhal *et al.* (1984) emphasized the need to look at a patient's everyday beliefs and strategies for coping with health threats rather than their personality, and the SRM is consistently described as having five components: identity, cause, timeline, consequences, and control/cure. Using these components to study patient perceptions and behaviours, the illness representation theory has been seen as an important framework for predicting patients' capacity to cope, and for developing interventions to promote self-management in chronic illness. Perceptions of less adverse 'consequences' of illness appear to be associated with more positive health outcomes in a variety of health settings (Pollock 1993, Hampson *et al.* 1994, Jensen *et al.* 1994, Petrie *et al.* 1996, Scharloo *et al.* 1999). Similarly, Meyer *et al.* (1985) found patients' initial perceptions about their illness 'timeline' to be a good predictor of whether they remained in treatment.

The consistency of numerous research findings identifying the illness representation framework as a predictor of health outcomes has lead to the creation of a psychometrically sound Illness Perception Questionnaire (IPQ). This consists of five sub-scales that assess the components of illness perception (Weinman *et al.* 1996).

Self-efficacy

Like the Illness Representation Model, self-efficacy expectation is associated with a wide range of health outcomes (Schwarzer 1992), and has been shown to predict recovery of function in rehabilitation (Johnson & King 1995). The leading writer in this field is Albert Bandura (1977, 1982, 1986, 1997), who asserts that perceived self-efficacy is not a measure of the skills one has, but a belief about what one can do under different sets of conditions with whatever skills one possesses. Bandura (1997) distinguished two types of expectations: outcome expectation and self-efficacy. Outcome expectancy beliefs refer to the perception of the possible consequences of one's own action: that a given behaviour will lead to a particular outcome. According to Bandura (1977), expectations of self-efficacy are the most powerful determinants of behavioural change because self-efficacy determines the initial decision to perform behaviour, the effort expended, and persistence in the face of adversity. Convincing the patient that certain behaviour will lead to a desirable outcome may not produce behavioural change unless they believe that they can perform the behaviour in the required situation.

Empirical research by Bandura and by others (Bandura 1977, Schwarzer & Fuchs 1996, Bandura 1997) has demonstrated positive correlations between therapeutic changes in behaviour and changes in self-efficacy. The psycho-educational interventions based on expectancy theory aim to respond to individual patient constructs of their illness and the potential for recovery (Linden *et al.* 1996, Bandura 1997, Dusseldorp *et al.* 1999), and are particularly relevant for individualized care, as evidenced in numerous studies with a range of conditions: cardiac patients compliance to exercise regimes (Ewart 1992, Jeng & Braun 1997); adjustment in cancer patients (Beckham *et al.* 1997); control of chronic pain (Lackner *et al.* 1996, Rejeski *et al.* 1998, Arnstein *et al.* 1999, Asghari & Nicholas 2001); and addictive behaviour (Marlett *et al.* 1994).

Sherer and Maddux (1982) stated that, although self-efficacy has been primarily conceptualized as a situation-specific belief, there is evidence that the experiences of personal mastery that contribute to efficacy expectancies generalize to actions other than the target behaviour.

Common themes

The research literature shows that both illness representation and self-efficacy offer health care professionals a basis from which to address the individual needs of patients. Until now the choice has been to adopt one or other of these conceptual frameworks as the basis for designing therapeutic

interventions. Although the detail of these two approaches may have been independently constructed, at their core there is a general commonality. Each argues that patients' personal constructs of their condition and of their ability to cope with that condition are the basis of effective individualized care. Moreover, they both argue that it is through an individual's accumulated experience, rather than their personality, that their actions and perceptions are informed. Underpinning both theories is the acknowledgement that patients are interpreting the events that affect them and constructing responses and future outcomes from a rational base that is unique to each individual patient. It is these decisions and patients' subsequent behaviour that need to be better understood by nurses before a framework of individualized care can be effectively provided.

Given that there is a considerable general overlap within the two theoretical frameworks it is surprising that there has been no research undertaken to establish what relationship, if any, exists between the components of these models. We, therefore, conducted a study to examine the possibility of a relationship, adopting the hypothesis that patients' illness perception will predict their self-efficacy following a cardiac event, and to consider what implications this could have for nursing practice. To cover both general and specific efficacy, we incorporated three efficacy questionnaires – a general self-efficacy questionnaire and a context-specific self-efficacy for diet and another for exercise.

The study

Aim

The aim of the study was to explore the possible relationship between illness perception and self-efficacy following a cardiac event, and the implications this could have for nursing practice.

Design

A survey design was used with a cohort of patients in the south of England.

Participants

The cohort sample for this study was based on patient responses from two district hospitals in the south of England gathered over a period of 8 months during 2002. These patients had to be able to understand and read English in order to complete the questionnaire unaided, be aged 18 years or above, and be admitted to hospital following a heart attack (myocardial infarction) or with a diagnosed angina. A total of 300 sets of questionnaires were issued directly to patients by clinical staff and 253 were returned completed, a response rate of 84%. A summary of the characteristics of the participants is set out in Table 1 below:

Instruments

There were four prevalidated instruments and two created specifically for the study. The four prevalidated questionnaires have had considerable application in recent research and have proven reliability and validity.

Illness Perception Questionnaire

The IPQ by Weinman *et al.* (1996) was devised to measure the components of illness representation, and is based on Leventhal et al.'s cognitive model of illness perceptions. It contains five scales:

- 'Identity': 10 items to assess the number and frequency of various symptoms a patient may experience in their illness which reflect the individual's perception of what the problem is;
- 'Timeline': three items to assess the individual's belief about the duration of the illness and whether it will be acute, chronic, episodic or cyclical in nature;
- 'Consequences': seven items to assess individual perceptions about the effects of physical, social, economic and emotional consequences;

Table 1 Summary of demographics and illness characteristics

Demographic/illness characteristics variables:	Frequencies (%)
Sex	
Male	195 (78·6)
Female	53 (21·4)
Age (years) Mean (SD) = 65·3 (10·8); range = 43–93	
< 65	109 (43·1)
> 65	144 (56·9)
Living arrangement	
Alone	40 (16·1)
Not alone	209 (83·9)
Employment status	
Employed	94 (37·8)
Not employed	155 (62·2)
Diagnosis	
Angina	112 (50·2)
Myocardial infarction	111 (49·8)
History of heart problems	
First time heart problem	151 (60·9)
Has previous heart problems	97 (39·1)
Type of admission	
Emergency	136 (55·3)
Routine	110 (44·7)

- 'Control/cure': six items to assess individual perceptions about the degree of control the individual feels they have over the illness and whether they believe it to be curable.

Scores were calculated using the mean score of the actual values of the items for each of the illness perceptions components, except for the 'Cause' scale, where each item represent a specific causal belief and the items cannot be analysed as continuous data and so cannot be summed. Therefore, this scale was not included as an independent variable in this study. In the current study, each scale in this questionnaire obtained an adequate internal consistency using the Cronbach alpha reliability coefficient test ('identity', $\alpha = 0{\cdot}78$; 'timeline', $\alpha = 0{\cdot}75$; 'consequence', $\alpha = 0{\cdot}72$ and 'control/cure', is marginally adequate $\alpha = 0{\cdot}59$).

Generalized self-efficacy scale

The Generalized Self-Efficacy Scale (GSES) was devised by Sherer and Maddux (1982) to assess the strength of an individual's belief in their ability to respond to novel or difficult situations and to deal with obstacles or setbacks. Scores are calculated using the mean score of the actual values of the 17 items (reversing scores where appropriate). The GSES has a reported Cronbach alpha reliability coefficient of 0·86 (Sherer & Maddux 1982), and in the current study its internal consistency was adequate at alpha = 0·68.

Cardiac diet and exercise self-efficacy instruments

The Cardiac Diet Self-Efficacy Instrument (CDSEI) and Cardiac Exercise Self-Efficacy Instrument (CESEI), were both devised by Hickey *et al.* (1992) to measure a patient's belief in their ability to cope with behaviour changes in diet or exercises after a cardiac event. The overall CDSEI and CESEI scores were calculated using the mean scores of the actual values of the 16 items of each of the scales. These instruments have been found to have high internal consistency, with alpha coefficients of 0·9 (Hickey *et al.* 1992), and for the current study alpha was 0·93.

Diet and exercise outcome expectation scales

Alongside these predesigned instruments, two more were designed for this study to cover Diet Outcome Expectation (DOES) and Exercise Outcome Expectation (EOES). These three-item scales were designed to assess patients' beliefs about the contribution that maintaining a healthy diet/exercise regime will have to recovery or prevention of further heart problems. The design of the outcome expectation scales were based on an extensive literature review and Bandura's theory; and developed and reviewed by practitioners. The overall DOES and EOES scores were calculated using mean scores of the actual values for the three items of each of the scales. The scales were tested for internal consistency and alpha was 0·72 for Outcome Expectation of Diet and 0·84 for Outcome Expectation of Exercise in a pilot study. In the main study both scales had a similar consistency.

Data collection

Cardiologist consultants and nursing directors in the target hospitals gave approval to access cardiac patients for the study. Unit/ward nursing g staff distributed coded questionnaire packs consisting of:

- a letter from the researcher inviting patients to participate in the study;
- a participant information sheet to enable patients to make an informed decision about participation;
- a consent form;
- a questionnaire to collect measurements of illness perceptions, self-efficacy and patient's demographic and medical data;
- a return addressed envelope.

These packs were administered to cardiac patients as inpatients, prior to their discharge, and before they attend any organized rehabilitation programme.

Ethical considerations

The pack and research protocol were approved by the Local Research Ethic Committees.

Data analysis

For each of the demographic and illness characteristics variables including sex, age, history of heart problem, cardiac diagnosis, route of admission, living arrangement and employment an independent sample *t*-test, using SPSS for windows, was conducted to compare their mean scores on the self-efficacy scales, illness perceptions scales and outcome expectation scales. Pearson correlation analysis was used to examine the relationship between self-efficacy (general, diet and exercise) and each factor measured in the illness perception and diet/exercise outcome expectation questionnaires. Where bivariate correlations indicated strong associations, multiple regression analysis was employed to examine these associations further. Multiple regression was used to assess the relative importance of each of the factors in illness perception and diet/exercise outcome expectation in predicting the three self-efficacy measures (general, diet and exercise).

The mean and SD of each of the dependent and independent variables are given in Table 2.

Table 2 Mean and SD for all variables

Variables	*n*	Mean	SD
Independent variables			
Identity	251	1·78	0·48
Timeline	249	3·61	0·82
Consequences	250	3·18	0·67
Control/cure	250	3·62	0·57
Diet outcome expectation	252	3·85	0·80
Exercise outcome expectation	251	3·85	0·83
Dependent variables			
General self-efficacy	250	3·63	0·59
Diet self-efficacy	248	3·53	0·81
Exercise self-efficacy	234	2·89	0·94

Results

Demographics and illness characteristics analysis

As the demographic and illness characteristics analysis had been subjected to multiple comparisons, the significant level of the P value was set at $P < 0{\cdot}01$ for the t-tests. The significant results are set out in Table 3.

Women patients identified more symptoms than males. Patients with a first-time heart problem tend to have a higher sense of control, identify fewer symptoms and view their cardiac condition as short-term. Patients who lived on their own tended not to believe that exercise was important for their cardiac recovery. Employment status was also had a significant impact on general outlook and coping capacity. Patients who were in employment tended to have a

Table 3 Summary of the effects of demographic and illness characteristics on illness perception and self-efficacy variables: significant differences after P value for t-tests is set at $P < 0{\cdot}01$

Demographic and illness characteristics variables	Illness perception and self-efficacy measures: *n*, mean (SD)	*t*-test	d.f.	*P* value	95% CI	
					Lower	Upper
Sex	Identity: Male: 189, 1·70 (0·46) Female: 53, 2·06 (0·47)	−5·04	240	0·0005	−0·50	−0·22
History of heart problem	Control/cure: No history: 149, 3·72 (0·53) Has history: 96, 3·47 (0·57)	3·53	243	0·001	0·11	0·39
	Timeline: No history: 149, 3·51(0·78); Has history: 95, 3·84(0·75)	−3·23	242	0·001	−0·53	−0·13
	Identity: No history: 148, 1·70 (0·46); Has history: 95, 1·88 (0·49)	−2·90	241	0·004	−0·30	−0·06
Living alone	Exercise outcome expectation: Living alone: 40, 3·42 (0·88) Not living alone: 207, 3·94 (0·79)	−3·76	245	0·0005	−0·79	−0·25
Route of admission	Consequences: Emergency admission: 134, 3·31 (0·63) Routine admission: 109, 3·03 (0·66)	3·25	241	0·001	0·11	0·44
Employment	Control/cure: Employed: 93, 3·8 (0·49) Not employed: 153, 3·51 (0·57)	3·92	244	0·0005	0·14	0·42
	Exercise outcome expectation: Employed: 93, 4·1 (0·81) Not employed: 153, 3·7 (0·8)	3·76	245	0·0005	0·19	0·60
	Diet outcome expectation: Employed: 94, 4·04 (0·79) Not employed: 154, 3·76 (0·77)	2·84	246	0·005	0·09	0·49
	General self-efficacy: Employed: 93, 3·77 (0·53) Not employed: 153, 3·55 (0·61)	2·84	244	0·005	0·07	0·37

significantly higher sense of control, believe that maintaining an exercise regime and healthy diet was important for their cardiac recovery, and they were generally more confident in coping with the changes in their lives.

Bivariate correlations for dependent and independent variables

Analysis using a Pearson correlation for the dependent and independent variables explored the relationships between variables. A summary of the correlations is given in Table 4.

General self-efficacy was found to be significantly and negatively related to 'consequences' and 'identity'; and positively related to 'exercise outcome expectation' and 'control/cure'. This relationship indicates that patients with high general self-efficacy were more likely to view their heart condition as having fewer consequences for their lives, to feel that they are in control of the situation, to report fewer symptoms and to think that maintaining regular exercise would help their recovery. Exercise self-efficacy was negatively related to 'identity' and positively related to 'timeline', 'control/cure' and exercise and diet 'outcome expectations'. Diet self-efficacy was significantly related to 'timeline' and 'exercise outcome expectation'. It is interesting to note that, unlike general self-efficacy, both exercise self-efficacy and diet self-efficacy had a significant and positive relationship with 'timeline' and not 'consequences', which indicates that illness perception has a different relationship to general self-efficacy than it has to specific self-efficacy.

Results of multivariate analysis

Stepwise multiple regression analysis, using SPSS for windows, was employed to weight the relative contributions of each of the independent variables in predicting the level of general self-efficacy, exercise self-efficacy, and diet self-efficacy. The demographic and illness characteristic variables were also entered into the equation as a control for the evaluation of the effect of illness perceptions and outcome expectations on each self-efficacy variable. As a result, three multiple regression models were created.

(i) The first multiple regression was performed using general self-efficacy as the dependent variable and illness perception and outcome expectation as independent variables. Demographic and illness data were entered as controls. The best-fit model was produced with three significant predictors and the R^2 of the model was 0·103, accounting for 10·3% of the variance in general self-efficacy. The model predicts the criteria significantly [F (3,216) = 2·632, $P < 0·0005$]. A summary of the results is presented in Table 5. Three of the independent variables contributed significantly to the prediction of general self-efficacy:

- the illness perception component 'consequences';
- the demographic characteristic 'employment'; and
- 'exercise outcome expectation'.

Patients who were in employment, viewed their cardiac illness as having fewer consequences and believed that regular exercise would benefit their recovery were likely to have high general self-efficacy.

(ii) The second multiple regression was performed using exercise self-efficacy as the dependent variable and illness perception and outcome expectation as independent variables. Demographic and illness data were entered as controls. The best-fit model was produced with three significant predictors and the R^2 of the model was 0·224, accounting for 22·4% of the variance in exercise self-efficacy. The model predicts the criteria significantly [F (3,203) = 19·551, $P < 0·0005$]. A summary of the results is presented in Table 6. Three of the independent variables contributed significantly to the prediction of exercise self-efficacy:

- 'exercise outcome expectation';
- the illness perception component 'timeline'; and
- the illness characteristic 'history of heart problem'.

Table 4 Correlation between dependent and independent variables

Predictors	General self-efficacy	Exercise self-efficacy	Diet self-efficacy
Identity	−0·132*	−0·161*	−0·092
Timeline	−0·021	0·179**	0·148*
Consequences	−0·183**	0·075	0·017
Control/cure	0·181**	0·273**	0·086
Diet outcome expectation	0·044	0·226**	0·071
Exercise outcome expectation	0·210**	0·413**	0·186**

*$P < 0·05$; **$P < 0·01$.

Table 5 Multiple regression to predict general self-efficacy from demographics and illness characteristics, illness perception and outcome expectations

Independent variables	Standardized coefficients beta	*t*-test	*P* value	95% CI for β	
				Lower	Upper
Exercise outcome expectation	0·166	2·505	0·013	0·025	0·213
Consequence	−0·207	−3·167	0·002	−0·296	−0·069
Employment	−0·172	−2·558	0·011	−0·370	−0·047

Table 6 Multiple regression to predict exercise self-efficacy from demographics and illness characteristics, illness perception and outcome expectations

Independent variables	Standardized coefficients beta	*t*-test	*P* value	95% CI for β	
				Lower	Upper
Exercise outcome expectation	0·406	6·542	0·0005	0·324	0·603
Timeline	0·213	3·356	0·001	0·101	0·389
History of heart problem	−0·146	−2·298	0·023	−0·522	−0·040

Table 7 Multiple regression to predict diet self-efficacy from demographics and illness characteristics, illness perception and outcome expectations

Independent variables	Standardized coefficients beta	*t*-test	*P* value	95% CI for β	
				Lower	Upper
Exercise outcome expectation	0·208	3·138	0·002	0·076	0·331
Timeline	0·164	2·492	0·013	0·034	0·290
Sex	0·138	2·067	0·040	0·013	0·329

Patients who had no history of cardiac illness, believed that regular exercise would benefit their cardiac recovery and that their cardiac would last for a long-time were likely to have high exercise self-efficacy.

(iii) The third multiple regression was performed using diet self-efficacy as the dependent variable and illness perception and outcome expectation as independent variables. Demographic and illness data were entered as controls. The best-fit model was produced with three significant predictors and the R^2 of the model was 0·077, accounting for 7·7% of the variance in diet self-efficacy. The model predicts the criteria significantly [F (3,216) = 5·967, $P < 0·001$]. A summary of the results is presented in Table 7. There were three variables contributing significantly to prediction of diet self-efficacy:

- 'exercise outcome expectations';
- the illness perception component 'timeline'; and
- the illness characteristic 'sex'.

Women patients who believed that regular exercise would benefit their cardiac recovery and that their cardiac condition will last for a long-time are likely to have a high diet self-efficacy.

Discussion

The analysis of the demographic and illness characteristics showed many similarities with the findings of other studies. Firstly, women identify significantly more symptoms for their heart condition than males (Low 1993, Artinian & Duggan 1995). Moreover, as with other studies where women place more emphasis on emotional support over exercise benefit (Moore 1996), they identify as less important both the exercise outcome expectation and exercise self-efficacy. Secondly, patients living on their own tended not believe that exercise was important for their cardiac recovery and also exhibited less confidence in their ability to manage exercise. Marital and social support have already been identified as important factors for recovery in cardiac illness (SIGN 2002). Thirdly, employment status had a significant impact on general outlook and coping capacity, providing a higher sense of control and a belief that maintaining exercise and diet is important for cardiac recovery. Previous research has linked employment status to a more positive outlook in which patients believe that their cardiac condition would be likely to last for a shorter time but have greater consequences for their lives (Schwarzer 1992, Petrie *et al.* 1996, Wenger *et al.* 1996, Cooper *et al.* 1999). Fourthly, patients with no history of a cardiac condition had a higher sense of control, which has often been associated in the research literature with positive health outcomes such as early return to work, or resumption of normal physical and social activity (Pollock 1993, Hampson *et al.* 1994, Jensen *et al.* 1994). All these initial findings were further refined to establish the strength of their relationships with illness perception and self-efficacy.

The overall findings of the bivariate correlation analysis suggest that there is a relationship between illness perception and self-efficacy. General self-efficacy related negatively to 'consequences', and both exercise and diet self-efficacy related positively to 'timeline' and had no significant relationship with 'consequences'. Hence, the greater perceived consequences of the heart condition, the lower the general self-efficacy available to cope with the condition. Further, the longer the perceived time the condition will affect the patient, the higher the specific self-efficacy to maintain a change of diet or exercise regime. These relationships were subjected to further analysis and were established as predictors – 'consequences' for general self-efficacy and 'timeline' for diet and exercise self-efficacy. Patients' perceptions of the extent to which their condition would affect them and their current lifestyles was connected to their general level of confidence. The perceived duration of the condition directly affected their willingness to commit to changes in lifestyle in terms of diet and exercise behaviour.

The results of the multivariate analysis suggest that cardiac patients perceive general self-efficacy and specific self-efficacy differently. Nurses, therefore, need to examine patients' perceptions of their illness and become aware of how these perceptions influence their attitude towards, and ability to

cope with, different rehabilitation regimes. The most important relationship for general self-efficacy is an individual patient's perception of the effects of physical, social, economic and emotional consequences on their life after their diagnosis of cardiac illness. Sherer and Maddux (1982) suggested that general self-efficacy reflects individual's confidence in their ability to cope with especially new situations. Our findings suggest that, if nurses are to help patients cope with the newly diagnosed cardiac condition, it is important that they understand the patient's interpretation of the 'consequence' of this condition and are aware of the potential effects of influencing or clarifying the patient's interpretation of their condition on their ability to cope with the new situation. At the same time, the findings show that nurses should not infer that a patient's general level of self-efficacy will reflect that patient's confidence in making and sustaining specific changes in exercise or diet.

Specific self-efficacy and general self-efficacy are seen as separate and quite different by patients, with different factors influencing each. Our findings indicate that 'timeline' positively predicts exercise and diet self-efficacy. This contradicts previous research, which shows that a low level of perceived disability or seriousness of illness appears to be associated with more positive outcomes (Hampson *et al.* 1994, Jensen *et al.* 1994, Petrie *et al.* 1996 & Pollock 1993). However, it is supported by the Meyer *et al.* (1985) study of patients with hypertension, which suggests that if patients are able to accept that their condition is long-term (timeline) they are more likely to participate in, and sustain, the treatment regime. In our study patients who had been recently diagnosed with myocardial infarction or angina, and accepted that their condition was long-term (timeline), were likely to exhibit high exercise and diet self-efficacy. This result is particularly important for nurses as it suggests that if, in the early stages of treatment, nurses can help patients to accept that their heart condition is long-term, this is likely to help increase the patient's self-efficacy in relation to making and sustaining changes to their lifestyle and adhering to their rehabilitation programme.

Experimental research by Bandura and colleagues (Bandura 1977, 1997) has suggested that specific self-efficacy is a more powerful predictor for behaviour changes in the initial decision to perform the behaviour, effort expended and persistence in the face of adversity than outcome expectation and past performance. Patients' self-efficacy expectations are critical in any analysis of therapeutic change, and nurses can influence such expectations in a variety of ways, including performance feedback and observational learning, as well as the more familiar information and persuasion (Bandura 1997). If nurses can focus on the development of patients' capacity to change and address the key issues of 'timeline' identified in this study, there is more likelihood that they will be able to devise interventions that enable patients to make lifestyle changes to which they can adhere over the long-term.

Finally, only three demographic and illness characteristic variables predicted self-efficacy:

- 'employment' predicted general self-efficacy;
- 'history of cardiac illness' predicted exercise self-efficacy; and
- 'sex' predicted diet self-efficacy.

'Diagnosis of cardiac illness', 'route of admission', 'age' and 'living arrangement' did not affect self-efficacy. Both 'diagnosis of cardiac illness' and 'route of admission' reflect the severity of the illness and this lack of relationship supports previous research identifying that perception of the illness is more influential than its severity (Byrne 1982, Diedericks *et al.* 1991, Petrie *et al.* 1996). Patients with a mild cardiac condition can be less capable of responding effectively to therapeutic interventions than those with a more severe condition because they perceive the consequences more negatively. Such patients require nurses to focus on the development of their internal coping resources rather than to provide information about the level of severity of their condition. Moreover, nurses must remember that the severity of a patient's condition has little bearing on their overall capability to attempt to cope with it. It is their perception of the consequences and the length of the illness that will affect their willingness to try to make lifestyle adjustments and cope, using the therapeutic support available.

Limitations

Although cross-sectional studies can be used to measure current health behaviour and predict future behavioural intentions, research has suggested some of these intentions are not robust predictors of actual behaviour (Conner & Norman 1996). To address this concern, a longitudinal follow-up is recommended to control for the effects of past behaviour in attempting to predict current and future behaviour. It is also worth noting that three characteristics of our sample – ethnicity, sex and age – are not representative of the national sample involved in cardiac rehabilitation. The sample was predominantly white (97·6%), reflecting the catchment area of the two hospitals. The male/female ratio of the participants was slightly more male-dominated and older than that in the most recent national survey statistical studies on coronary heart disease reported in the British Heart Foundation (2001) Statistics Database. 'Age' as a factor, however, was tested and found to make no significant

What is already known about this topic

- Psychological support is the most important factor in increasing the effectiveness of individualized cardiac rehabilitation.
- Despite numerous national guidelines on the management of cardiac rehabilitation, the psychological factors remain poorly assessed.
- Illness representation and self-efficacy are the two dominant theoretical approaches to developing psychological support.

What this paper adds

- There is a relationship between the two theoretical approaches, and this should inform the design of nursing interventions to provide individualized care in cardiac rehabilitation.
- The greater the perceived consequences of the heart condition, the lower is the general self-efficacy available to cope with the condition.
- The longer the perceived time the condition will affect the patient, the higher the specific self-efficacy to maintain a change of diet or exercise regime.

contribution to the multiple regression analysis and the sex differences explored.

Conclusion

Our findings support the hypothesis that there is a significant relationship between illness perception and self-efficacy, and that illness perception components predict self-efficacy. Until now the two approaches have been developed separately and without reference to each other. This study suggests that nurses will gain a more comprehensive understanding of patients' reactions to their conditions and treatment by combining the separate strands of illness representation and self-efficacy research. The findings indicate that, following the initial diagnosis of their condition, two key variables – 'consequence' and 'timeline' – are crucial for nurses in predicting patients' confidence in their ability to cope with their condition, both in general and with specific lifestyle changes required in their longer-term recovery programme. Therefore, these two variables are important when designing appropriate individual intervention strategies with cardiac patients. By putting the two theories together, it would be possible for nurses to focus on the key elements of patient treatment and design individualized interventions based on a clearer framework.

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