

Board, L., Thatcher, J., Lavalley, D., Golby, J., and Arrighi, C. F. M. (2003). Cardiac rehabilitation and psychological well-being. In S. P. Shohov (Ed.), *Advances in psychology research* (pp. 237-253). New York: Nova Science

Abstract

The aim of this chapter is to address psychological issues associated with effective multidimensional cardiac rehabilitation programmes. Cardiac rehabilitation is defined as: “the sum of activities required to influence favourably the underlying cause of the disease, as well as the best possible, physical, mental and social conditions, so that they (people) may, by their own efforts preserve or resume when lost, as normal a place as possible in the community. Rehabilitation cannot be regarded as an isolated form or stage of therapy but must be integrated within secondary prevention services of which it forms only one facet” (World Health Organisation, 1993). The chapter will: discuss the impact of CHD in the UK, provide an overview of the Government strategy for reducing the burden of cardiac disease and disability, and review quantitative evidence discussing the effectiveness of cardiac rehabilitation on the mental health and well-being of cardiac patients, with particular reference to anxiety and depression states. The final part of this chapter presents results of a qualitative study, previously reported in Hudson, Board, and, Lavalley (2001) that examined the psychosocial impact of cardiac disease and rehabilitation for patients attending one cardiac rehabilitation scheme in England.

Cardiac Rehabilitation and Psychological Well-Being

The British Heart Foundation (BHF, 2002) revealed diseases of the heart and circulatory system (cardiovascular disease or CVD) as the leading cause of mortality in the United Kingdom (UK), accounting for over 235,000 deaths, or 39%, of all mortality in 2000. It is also one of the main causes of premature death in the UK (death before the age of 75). The main forms of CVD are coronary heart disease (CHD) and stroke. CHD, which accounted for approximately half of CVD mortality in 2000, is, by itself, the most common cause of death in the UK killing one in four men and one in six women (BHF, 2002). In England, it is the Northern Region that demonstrates the highest CHD premature death rates for both men and women (318 and 121 per 100,000 population, respectively) exceeding the UK average figures (260 and 93 per 100,000 population, respectively, for men and women). Globally, despite the UK decline in CHD, equating to approximately 4% per annum since the late 1970s, UK CHD mortality rates remain high in international terms and have fallen less than in other comparable countries such as the US or Australia. CHD poses tremendous human and economic costs. Individuals suffer pain, disability, fear and bereavement, while the economy of the nation is weakened by sickness and absence from work, early retirement and high demands on health and social services (Harper, 1985). CHD is a high priority in the public health strategy because it is common, frequently fatal and largely preventable. The UK Government has set challenging targets for improving health and reducing the enormous burden of CHD morbidity and mortality (Department of Health, 1999). More recently, with the prevention and rehabilitation of CHD of paramount importance, the Government published the National Service Framework (NSF) for CHD (Department of Health, 2000) setting clear standards and outlining how these standards can be delivered and monitored.

Cardiac rehabilitation

Commonly, patients who suffer a cardiac event, for example, a myocardial infarction (MI) or who undergo cardiac surgery (e.g., a coronary artery bypass graft) or experience symptoms of underlying cardiac disease, for example, angina, are, following hospital treatment, offered a multidimensional cardiac rehabilitation intervention program. The goals of this program are restoration to optimal physiological, psychological and vocational status, and reduction of risk of subsequent cardiac morbidity and mortality (Lear & Ignaszewski, 2001). Strong evidence supports the efficacy of cardiac rehabilitation programs (O'Connor et al, 1989; Oldridge, Guyatt, Fischer, & Rimm, 1988) and in response cardiac rehabilitation programs in the UK have proliferated in recent years. In 1989, the British Cardiac Society located 90 UK programs (Davidson, Reval, Chamberlain, Pentecost, & Parker, 1995) whereas the most recent survey identified 273 cardiac rehabilitation programs (Lewin, Ingleton, Newens, & Thompson, 1998).

Community cardiac rehabilitation programs continue the multidimensional approach initiated through the hospital and, although mainly centred on a structured exercise program, involve key educational components including basic cardiology education, psychosocial counselling, nutritional advice, weight management and modification of risk factors such as smoking, stress management and alcohol consumption (McGee, Hevey, & Horgan, 1999). The aims of community cardiac rehabilitation programmes are, therefore, diverse and can be summarized as follows: to improve survival, to reduce angina symptoms, to lower blood pressure, to enhance lipid profiles, to increase functional capacity, to improve psychosocial well-being (e.g., reducing anxiety and depression levels and restoring patients' self confidence), to improve physical well-being (e.g., weight control, strength and stamina), to improve return to work and leisure activities, and, to improve compliance with lifestyle modification (British Association of Cardiac Rehabilitation, 1995). In short, they aim to improve quality of life and promote secondary prevention of cardiac disease (World Health Organization, 1993).

The idea that exercise may be used as a method of rehabilitation in cardiac patients is certainly not a new one. Stokes (1854) advocated the use of ‘pedestrianised exercise’ in the rehabilitation of his cardiac patients. However it was not until the late 1970s that exercise became a widely used tool in cardiac rehabilitation. By this time it had become clear that immobilisation and reduced physical activity were associated with poor long-term prognosis and survival (Lear & Ignaszewski, 2001). Increasing research evidence, primarily focused on mortality data, supports the efficacy of cardiac rehabilitation programmes (Hedback, Perk, & Wodlin, 1993; Horgan et al., 1992; Oldridge et al., 1988). In their meta-analysis of ten randomized clinical trials, Oldridge et al. (1988) revealed a reduced mortality risk of approximately 20-25% over three years following participation in a cardiac rehabilitation programme after a myocardial infarction. However, Uniken Venema-van Uden et al. (1989) demonstrated that some, but not all, patients benefit medically from a cardiac rehabilitation programme. While medical improvements were observed in 43% of the 316 patients included in this study, 17% exhibited no change in medical condition and 20% demonstrated some deterioration. However, as clearly stated by Lespérance and Frasure-Smith (1999), although mortality remains a key outcome in the management of cardiovascular disease, “we should not lose sight of the fact that an intervention that improves well-being, but fails to change survival, is still a very valuable treatment”. With this in mind, it is promising to see the support for, and the publication of, other cardiac rehabilitation efficacy outcomes, in particular, quality of life.

Psychological effects

Until recently the use of exercise in cardiac rehabilitation has been concerned mainly with the physiological adaptations that exercise brings about in the human body. Although these physiological adaptations are greatly important to cardiac patients, it is well documented that these patients may also suffer from psychological disturbances. Five types of psychosocial

factor have been found to be most consistently associated with an increased risk of CHD: work stress; lack of social support; depression; anxiety, and personality characteristics, in particular, hostility (BHF, 2002). Most people are resilient and the adverse psychological consequences of cardiac trauma are transient, but for some, the psychological consequences of cardiac trauma can in themselves be persistent and disabling (Department of Health, 2000). Depression and anxiety are commonly prevalent following MI. Milani, Lavie, and Cassid (1996) found that in the 4-6 weeks following an MI 40% of cardiac patients exhibited symptoms of anxiety and depression. Similarly, Lespérance and Frasure-Smith (2000) and Lane, Carroll, Ring, Beevers, and, Lip (2000) suggested that approximately 30% of all hospitalised patients with coronary artery disease suffered from some form of depression. Board, *et al* (2003) have recently found anxiety and depression in, respectively, 15% and 18% of cardiac patients recovering from MI or revascularisation surgery. Frasure-Smith, Lespérance, and, Talajic (1993) considered the implications of these psychological disturbances and identified that negative emotions had a huge impact on patient prognosis following an MI. As well as being commonly associated with chronic illness and an associated risk factor for CHD, in the cardiac patient, depression is also associated with an increased risk of mortality in the first six to twelve months following discharge (Frasure-Smith et al., 1993; Ladwig, Kieser, Konig, Breithardt, &, Borggreffe, 1991; Musselman, Evans, & Nemeroff, 1998). However, other studies have disputed the association between depression and mortality following an MI (Berkman, Leo-Summers, & Horwitz, 1992; Kaufman et al., 1999; Lane et al., 2000; Mayou et al., 2000). Given the diverse variation between studies, in terms of programme duration and provision, sample size, patient population and measurement tools, conflicting results are hardly surprising. Moos and Schaefer (1984) suggest that changes in physical fitness (i.e., through illness) can be seen as a crisis as they represent a turning point in a person's life. They suggest that physical illness, for instance, a myocardial infarction causes

changes in such variables as identity, location, role and social support, which may lead in turn to feelings of depression and anxiety. Many cardiac patients resist the idea of additional anti-depressive medications to deal with these consequences due to the large number of drugs they are already administered (Lespérance and Frasure-Smith, 2000). This resistance to treat psychological disturbances with medication thus further emphasises the role of alternative interventions, such as exercise, in dealing with mental health issues following cardiac trauma.

Inadequate social support or lack of social networks can also have a harmful effect on health and on the individual's chances of recovering from cardiac disease (Hemingway & Marmot, 1999; Lane et al., 2000). As yet there are no estimates of the numbers of deaths that could be avoided if psychological well-being was increased following a cardiac event and systematic research examining quality of life among cardiac patients is sparse. However, given existing evidence it is likely that improved psychosocial factors in cardiac patients may have a significant impact on morbidity. The National Service Framework for Coronary Heart Disease (Department of Health, 2000) has identified that following a major illness most people do in fact need some level of reassurance and psychological support to help regain their self confidence. Moreover, the Department of Health (2000) has emphasised the importance of addressing the psychological needs of cardiac patients.

Evidence supporting the amelioration of psychosocial well-being through structured exercise programs is accumulating across a number of differing populations, including the cardiac patient. Sedentary individuals have a two-fold risk of developing CHD and with an estimated 60% of men and 70% of women in the UK classified as sedentary, the population attributable risk for CHD from physical inactivity is very high. Clear research evidence exists to support the reduced risk for CHD as a consequence of physical activity participation (Blair, 1993; Oberman, 1995; Pate et al., 1995; Powell & Blair, 1993). Research has also highlighted that exercise may bring about changes in psychological variables such as anxiety (Martinsen,

1989; Orwin, 1974), self-esteem (Fox, 2000) and depression (Landers, 2001; Martinsen, Medhus, & Sandvik, 1985). Hence a cardiac rehabilitation program may, in addition to improving physical fitness, serve also as a tool for facilitating improvements in mental health. For instance, Saitoh, Kobayashi *et al* (2000) found that, following an aerobic exercise programme, cardiac patients showed an improvement in emotional mood state, particularly with regard to decreases in tension and anxiety. Schomer and Noakes (1983) found that following six months of cardiac rehabilitation, patients who failed to complete the program showed increasing levels of depression and emotional instability. In contrast, those patients who adhered to the program exhibited a 10% reduction in depression, a 4% reduction in tension and a 14% increase in emotional stability. The authors stated that adherence to the rehabilitation program played an important role in normalising psychological measures.

In an unpublished study, Board *et al.* (2003) monitored anxiety and depression in 33 cardiac patients immediately pre-, post- and six-months following a six-week structured exercise cardiac rehabilitation program. Using the Hospital Anxiety and Depression Scale (Zigmond & Snaith, 1983) mean anxiety scores decreased in the short term (4.36 to 3.73 pre-post exercise program, respectively). However, despite a subsequent increase in anxiety scores six months post programme (3.73 to 4.09 post-six-months post, respectively) anxiety scores at six-months did not reach pre-cardiac rehabilitation program levels. The trend was similar for depression scores. Depression levels decreased markedly over the course of the structured exercise program (4.18 to 2.00 pre-post program, respectively) and were seen to rise again at the six-month stage (2.00 to 2.35 post-six months, respectively) but encouragingly remained well below pre program scores. Improvements for anxiety were not significantly different but there was a significant difference between both the pre-post and pre-six month programme scores for depression. While the observed changes were not all statistically significant,

anecdotally the cardiac patients consistently reported improved feelings of psychological well-being.

Although evidence suggests that exercise based cardiac rehabilitation programs can improve psychological functioning most reported studies are only short term (acute) investigations, with psychological functioning being measured only pre- and post-program participation. There is a general lack of research relating to the longer term (six months and beyond) effects of a cardiac rehabilitation programmes on the psychological well-being of cardiac patients. This follow up period is important as 12-month mortality is increased when there is evidence of increased levels of anxiety and depression. (Lespérance & Frasure-Smith, 2000). In addition to assessments of the long-term consequences of cardiac rehabilitation programs, qualitative research may help to supplement existing, quantitative evidence concerning the psychological effects of cardiac trauma and the role of cardiac rehabilitation in dealing with these consequences. Qualitative research that explores not only specific mental health states, such as anxiety and depression, but examines the wider psychosocial implications of cardiac trauma and rehabilitation will help to broaden understanding of the cardiac patient's experience and, should contribute towards addressing their psychological needs (Department of Health, 2000). To this end, in a study reported previously (see Hudson, Board, & Lavalley, 2001), we used a qualitative approach to examine the psychosocial experiences of patients who had attended a cardiac rehabilitation program in the North east of England, where premature death rates attributable to CHD exceed the national UK average. The study employed a framework for understanding psychosocial growth and development that has yet to be applied to cardiac rehabilitation patients and which we anticipated would help to further illuminate their experiences and build on existing evidence concerning mental health changes in cardiac rehabilitation patients. This framework centers around the role of

gains and losses in the development of the individual across the life-span (Baltes, 1987) and is summarized below before the study itself is discussed.

Losses and gains: A life-span developmental perspective

Losses incurred following a cardiac event have also been identified as being important moderators of psychological and lifestyle adjustment among cardiac rehabilitation patients (Hellerstein, 1968; Lewin, Robertson, Cay, Irving, & Campbell, 1992). Indeed, poor adjustment to psychological trauma has been linked to the loss of self confidence (Lewin et al., 1992) and a loss of self confidence contributes to only a small percentage of cardiac patients returning to work resulting in loss of occupation, income and perceived status within the family and society. Other losses, which span a range of domains, include the loss of functional capacity, loss of previous lifestyle and behaviors and loss of independence (Hellerstein, 1968). Deriving from these, a number of secondary losses may be experienced including loss of self-esteem and self-definition.

Baltes' (1987) life-span development perspective, that views development as a dynamic interplay between losses and gains, is one that may therefore be readily extrapolated in an examination of survivors of a cardiac event. From this perspective, development does not simply involve a process of positive change, growth and adaptation. Instead, development involves positive and negative changes in the process of adaptation, that is, both gains and losses (Baltes, 1987). Furthermore, gains have been described by Uttal and Perlmutter (1989) as improvements in existing functions or structures, novel application of current structures and functions to new activities or domains, and, the addition of new structures or functions. Conversely, they define loss as decreased efficiency in old structures or functions. According to this theoretical perspective, loss is always experienced concurrently with gain (Hetherington & Baltes, 1988), and, whatever point in the life-span is considered, both biologically- and psychologically-based changes can be identified (Uttal & Perlmutter, 1989).

Methodology

Participants in the study were 12 males aged between 46 and 78 years who had previously completed a 6 week multidisciplinary cardiac rehabilitation program. All participants had experienced at least one MI during the previous five years and four had also undergone single or multiple bypass surgery. They were now engaged in a long-term “graduate” exercise class, continuing to attend medically supervised exercise sessions twice weekly at the local leisure center where the cardiac rehabilitation program was held. Time since completion of the program ranged from 18 months to 5 years.

The cardiac rehabilitation program

Prior to the cardiac rehabilitation program, patients were screened for medical suitability using a graded exercise treadmill test (Bruce protocol, Bruce, 1971) to establish physiological responses and symptom limited functional ability. The six-week phase III/IV program was held in a leisure center and led by a multidisciplinary team comprising cardiac nurses, exercise instructors, a physiotherapist, dietician and psychologist. Weekly, patients attended two, 2 hour sessions, consisting of one hour of structured exercise (cardiovascular equipment or water based) and an hour of educational instruction (e.g., nutrition or stress management). On completion of the six-week program patients were invited to attend graduate exercise classes. These one hour sessions were held twice weekly in the leisure center. Although patients were encouraged to take responsibility for structuring their own exercise, they were monitored and supervised by exercise instructors and cardiac nurses.

Data collection procedures

Participants were briefed as to the purpose of the study. Volunteers were individually solicited at the graduate exercise sessions and informed consent was obtained prior to involvement in the study. Sampling continued until all individuals had been approached and either their consent or refusal to participate in the study was obtained.

Semi-structured interviews were conducted with each volunteer in a quiet place in the leisure center, either preceding or following graduate sessions. Topics covered in this interview were as follows: expectations and perceptions of the cardiac rehabilitation program; lifestyle and attitude changes facilitated by the program; benefits and barriers to exercise; familial/social/work commitments; familial attitudes towards the program; reasons for adherence to the graduate exercise sessions, and, health. Respondents were not limited by these topics and were encouraged to discuss additional issues pertinent to them. Where necessary, probes were used to gain more detail on, or confirmation of, participants' responses. Participants' permission was obtained to tape record each interview and these recordings were transcribed verbatim. The first two authors conducted the interviews. Both of these authors have extensive training in qualitative data collection and analysis procedures.

Data analysis

Data analysis followed the principles of inductive content analysis (Lincoln & Guba, 1985) with one modification. Following transcription, each interview was read and re-read to enable the analyst to digest the interview content as a coherent whole. Second, salient quotations were identified from each transcript and listed as raw data. Salient quotations were those that referred to either losses incurred as a result of the cardiac event or to restoration of losses/gains experienced through participation in the cardiac rehabilitation program. It is not customary to identify raw data according to predetermined themes at this stage of qualitative data analysis. However, the specific aims of this study necessitated this approach to data analysis. These raw data were then organized into meaningful categories of increasing levels of abstraction. First this involved the identification of raw data themes, followed by any first and second order categories and finally, general dimensions. Raw data referring to experienced losses were categorized separately from those data pertaining to gains or restoration of loss. A second researcher, unaware of the outcomes of this analysis, was

presented with the raw data from the transcripts. Following the procedures outlined above, they undertook a second analysis of the data. Level of agreement was assessed by comparing the themes identified in these two analyses at each stage of this process. No discrepancies were evident in the content of raw data themes, their grouping into higher order categories and general dimensions, and, the interpretation of these categories and dimensions.

Results

Losses incurred due to a cardiac event

As outlined in Figure one, six raw data themes were identified initially and these were further combined into three higher order categories: sense of purpose, sense of self, and lifestyle. These three higher order categories were then subsumed within the general dimension of “loss of the person”.

Sense of Purpose. This higher order category was made up of two raw data themes; the first reflected the belief that life was over, “When I had the heart attack I thought that was it, my life was finished.” The second described the loss of purpose that was encountered through losing one’s occupation, “Because when you have it [cardiac trauma] you think to yourself what am I going to do now...I didn’t have a light job, cleaning houses, handling furniture, and you just couldn’t do it.”

Sense of Self. This higher order category also comprised two raw data themes: self, and, self-esteem. The former reflects a loss in key aspects of the self and personality that were evident before the patient’s cardiac event: “I thought my world was crumbling when I had my coronary. I went into a shell. I had been a very forceful person before.” The following quotation demonstrates how, for one patient, the consequences of his cardiac trauma underpinned a loss in self-esteem, “It has been hard, my daughter has had to borrow money for University, it should never have happened.”

Lifestyle. This final higher order category consisted of finance and physical capacity raw data themes. Through losing his occupation, one respondent explained that, “I was a skilled man and I’ve lost good money.” Loss of physical capacity was evident in responses such as the following, “Can’t do what I used to do. You take it for granted what you can do until you have a heart attack.” Falling under the general rubric of personal loss, it is not surprising that although clearly representing distinct themes, respondents’ comments indicate that these different categories do appear to be interrelated. Physical capacity influences the ability to fulfil one’s occupational role, which in turn contributes towards self-definition. Occupational role also provides a sense of purpose and influences financial status; this also contributes to levels of self-esteem.

Losses and gains experienced through cardiac rehabilitation

In this analysis, 16 raw data themes were identified from salient quotations and these were further classified into five first order categories: social support; increased awareness; sense of achievement; sense of purpose, and, psychological effects. Two second-order categories were derived from these themes: “support and education” (social support and increased awareness) and “developing self-esteem” (sense of achievement, sense of purpose, and psychological effects). Finally, the general dimension of “regaining sense of self” was abstracted from these two second-order categories. This analysis is represented in Figure 2.

Support and Education. The social support that respondents gained from their involvement in the cardiac rehabilitation program took two forms: socialising with others, “I’ve got more friends here than I’ve ever had before”, and the social support that stems from sharing a common bond with other patients, “If you talk to others it brings it all out, it makes them feel a lot better in themselves and they then talk to other people in the same position.” The first order category of increased awareness was based on three raw data themes, first, realisation of current physical capacity. In all cases this was in excess of previous estimates, “I learnt I was

able to do more. And I was once told by a doctor not to lift anything heavier than a mug of tea and that was it. And of course I knew nothing and it wasn't until I came on the course that I learnt a lot about what I was able to do and what was beneficial." Second, patients gained an understanding of basic cardiology, "I used to have a pain sitting in a chair, now I can tell the difference between indigestion and chest pain." The third theme reflected the patients' ability to make realistic appraisals of their lifestyles prior to their cardiac event, "The job I had was very stressful, I was a salesman for 30 odd year, targets to meet so that didn't help. So if I got another job it wouldn't be a stressful job because I wouldn't need it thank you."

Developing Self-esteem. This higher order category was abstracted from three first order categories that appeared to have a positive impact on respondents' self-esteem. Patients gained a sense of achievement through increasing their fitness levels and developing new physical skills, as might be expected, but also through helping others to develop and raising money for hospital equipment. Playing an instrumental role in the development and support of both oneself and similar others appeared to be a source of self-esteem for these patients. The following quotations illustrate each of these raw data themes:

"...we return the compliment by having charity dos and buying things for the ECG department...we do these things and we find a benefit." (raising money)

"I was on the treadmill twice as long at the end of the course than I was at first." (fitness gains)

"I couldn't swim – I was petrified of the water when I came but now I am able to swim." (developing new skills)

"We taught one [guy] to swim." (helping others develop)

The sense of purpose which respondents regained also impacted on their self-esteem and was derived from providing an active role model for current patients on the cardiac rehabilitation program, "...it does those people good to know that there's us as back up who've gone through it and it's done them the world of good." Contributing to this sense of purpose, the program also helped patients to develop a positive outlook, "It has given me faith to continue," and simply gives the patients, "...something to do on a Tuesday and a Friday."

A number of psychological effects that respondents mentioned also appeared to play a role in enhancing self-esteem. These were identified as, increased confidence: "It builds up your confidence otherwise you would sit in a chair at home," rejuvenation: "The rehab. has really made me...I feel like a new man," a changed attitude to one's life and situation: "It encourages a mental attitude which is as important as a physical attitude," and, exercise induced positive affect: "You feel a bit tired but you feel good".

Discussion

Overall, the cardiac rehabilitation patients' experiences were found to mirror the processes outlined by Baltes' (1987) theoretical perspective. If, as Baltes (1987) suggests, the cardiac event and rehabilitation are viewed as a developmental period in these patients' lives, this is a period involving not only loss but also significant gain. Furthermore, the cardiac rehabilitation program is an instrumental force in shaping the balance of experienced gains and losses.

Our results also support Baltes' (1987) position that change in later life does not necessarily involve only loss and negative adaptation but can, and does, also involve growth and progression. Given a supportive environment, the participants in this study were able to prevent or reduce further loss, and to restore lost functions and gain new ones, at both biological and psychological levels (Baltes, 1987). An important point raised by Uttal and Perlmutter (1989) is that the gains and losses experienced at any point throughout the life-span are not necessarily causally related. In the context of later life experiences, gains cannot

simply be seen as compensation for losses that result from biological ageing (Uttal & Perlmutter, 1989). We would suggest that our results support this interpretation in that the gains reported by the participants extend beyond providing a compensatory response to experienced losses. Participants learnt new skills, experienced new achievements and developed new approaches to life. In no way can these significant personal gains be viewed simply as compensation for lost biological and psychological functions, certainly not in the eyes of our respondents. Instead, they reflect real developmental gain, change and progression over and above acting as direct compensation for the losses incurred by participants in the current study.

The overriding hierarchical theme associated with a cardiac event was loss of the person, mediated by loss of previous lifestyle, loss of a sense of purpose, and, loss of a sense of self. The individual's sense of themselves as a person of worth and who has a purposeful role to play in society at both micro and macro levels, is important for continuing psychological and physical health (Mutrie, 1997). Core aspects of the person, including sense of purpose, sense of self and established lifestyle patterns and expectations are fundamental in maintaining self-esteem (Gergen, 1991). These are experienced losses therefore that, if not effectively addressed, may have far-reaching negative implications for these patients, particularly when the high levels of clinical depression observed in patients following a cardiac event, are considered (see McGee et al., 1999). For the patients involved in this study, their cardiac rehabilitation program played an integral role in helping them to deal with these losses.

This cardiac rehabilitation program served an educational function at both formal and informal levels. Through the formal aspect of the program, patients were educated about their condition and were provided with information and opportunities to reflect on the effects of previous lifestyle behaviours on their health. Importantly, with input from the program's medical experts and involvement in its individually tailored exercise schedules, these patients

developed realistic expectations of their current and potential functional capacities. In all cases, expectations of functional capacity were raised as a result of participation in the program. This represents an important development as future expectations and self-efficacy (confidence that one can achieve a desired outcome in a specific situation) have consistently been demonstrated as significant predictors of future behaviour (e.g., Ewart, Stewart, Gillilan, & Kelemen, 1986). If these patients had maintained their pre-program underestimates of their functional capacity, self-efficacy theory (Bandura, 1977) predicts that they may fail to engage in behaviors, such as mild exercise, that will provide long-term psychological and physical benefits.

Interaction with other patients attending the cardiac rehabilitation program offered an invaluable source of informal education. Patients gained reassurance by sharing concerns, symptoms, experiences and knowledge with others who had been in similar situations themselves. The function of shared experience as a support mechanism for these patients cannot be underestimated. As with any social group, the cardiac rehabilitation program and its follow-up graduate exercise group offered opportunities for social interaction and enjoyment. Kulik and Mahler (1993) have identified the importance of social support in enhancing emotional status following a cardiac event. However, the social support offered within this group extended beyond this, providing a small community of individuals, who, having shared a common experience, in the words of one respondent, “have a close link, been close to death”.

Most patients gained opportunities to experience achievement and regain a sense of purpose through their involvement in the cardiac rehabilitation program and its associated activities. This sense of achievement was gained through increases in fitness, skill development and raising money for hospital equipment. The patients themselves must play an active role in these achievements, thus increasing opportunities to enhance self-efficacy and

self-esteem (cf. Bandura, 1977; Deci & Ryan, 1985). The sense of purpose that many patients had lost was restored through their involvement in the cardiac rehabilitation program.

However, it appears that these patients derived a sense of purpose from different sources, with differing emphases, prior to and following the cardiac rehabilitation program. The cardiac program helped these patients to regain a sense of purpose through providing hope for the future, presenting opportunities to act as a role model for other patients at earlier stages of the rehabilitation process and by providing purposeful activity and structure to their lives.

Finally, the cardiac rehabilitation program contributed towards the restoration of a number of psychological factors. Exercise participation led to positive affect and the program as a whole helped patients to restore lost confidence with the educational and achievement opportunities it offered. Some patients literally felt rejuvenated, with a positive forward-looking perspective that was perceived as equal in value to physical recovery.

Combined, these different factors appear to contribute to a more abstract process, that of regaining a sense of self. Self awareness, sense of belonging, social support, self-esteem, positive self appraisal, and, a sense of purpose and achievement are all key elements in defining and accepting the self. For the participants in this study, the cardiac rehabilitation program they attended was instrumental in helping them, through the mechanisms listed above, to regain the sense of themselves that had been lost with the experience of a cardiac event.

In conclusion, suffering a cardiac trauma is a complex process that involves significant losses across a number of domains but also, for survivors, the opportunity to experience significant gains that not only compensate for, but build on, these losses. According to these patients, cardiac rehabilitation plays a pivotal role in this overall developmental process, facilitating developmental gain to provide a necessary dynamic balance between gains and losses. When added to the existing body of evidence that cardiac rehabilitation can help

patients to deal with the negative emotional consequences of cardiac trauma, such as increases in anxiety and depression, these results indicate the far-reaching role that cardiac rehabilitation can play in restoring psychosocial losses and facilitating further gains in these areas, following a cardiac event.

The overwhelming evidence identifying psychosocial disturbances in cardiac patients following MI or revascularisation surgery emphasises a clear direction, and capacity, for cardiac rehabilitation programs to incorporate appropriate intervention strategies to address the psychosocial needs of cardiac patients. The challenge remaining for practitioners and researchers in this area is to attempt to facilitate long-term changes in cardiac patients' psychological health, and, to evaluate the efficacy of these attempts.

References

- Baltes, P.B. (1987). Theoretical propositions of life-span developmental psychology: On the dynamics between growth and decline. Developmental Psychology, 23 (5), 611-626.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review, 84, 191-215.
- Berkman, L.F., Leo-Summers, L., & Horwitz, R.I. (1992). Emotional support and survival after myocardial infarction: A prospective, population based study of the elderly. Annals of Internal Medicine, 117, 1003-1009.
- Blair, S.N. (1993). Physical activity, fitness and health. Research Quarterly for Exercise and Sport, 64, 365-376.
- *Board, E.M., (2003). [INSERT TITLE HERE]. Unpublished raw data.
- *British Association of Cardiac Rehabilitation (1995). BACR Phase IV Cardiac Rehabilitation Course Manual. CITY HERE: BACR.
- British Heart Foundation. (2002). Coronary heart disease statistics: 2000. London: Author.
- Bruce, R.S. (1971). Exercise testing of patients with coronary heart disease. Principles and normal standards for evaluation. Annals of Clinical Research, 3(6), 323-332.
- Davidson, C., Reval, K., Chamberlain, D., Pentecost, B., & Parker, J. (1995). Report of a working group of the British Cardiac Society: Cardiac rehabilitation services in the United Kingdom. British Heart Journal, 73, 201-202.
- Deci, E.L., & Ryan, R.M. (1985). Intrinsic motivation and self determination in human behavior. New York: Academic Press.
- Department of Health. (1999). Saving lives: Our healthier nation. London: Author.
- Department of Health. (2000). National service framework for coronary heart

disease. London: Author.

- Ewart, C.K., Stewart, K.J., Gillilan, R.E., & Kelemen, M.H. (1986). Self-efficacy mediates strength gains during circuit weight training in men with coronary artery disease. Medicine and Science in Sports and Exercise, 18, 531-540.
- Fox, K.R. (2000). The effects of exercise on self-perceptions and self-esteem. In S.J.H. Biddle, K.R. Fox & S.H. Boutcher (Eds.), Physical activity and psychological well-being. London: Routledge.
- Frasure-Smith, N., Lesperance, F., & Talajic, M. (1993). Depression following myocardial infarction: Impact on six-month survival. Journal of the American Medical Association, 270, 1819-1825.
- Gergen, K.J. (1991). The saturated self: Dilemma of identity in contemporary life. New York: Basic Books.
- Harper, S. (1985). Preventing heart attacks: The way forward. Scottish Medicine, 5, 8-9.
- Hedback, B., Perk, J., & Wodlin, P. (1993). Long-term reduction of cardiac mortality after myocardial infarction: 10 year results of a comprehensive rehabilitation programme. European Heart Journal , 14, 831-835.
- Hemingway, H., & Marmot, M. (1999). Psychosocial factors in the aetiology and prognosis of coronary heart disease: a systematic review of prospective cohort studies. British Medical Journal, 318, 1460-1467.
- Hetherington, E.M., & Baltes, P.B. (1988). Child psychology and life-span development. In E. M. Hetherington, R.M. Lerner, & M. Perlmutter (Eds.), Child development in life-span perspective (pp. 1-19). London: Lawrence Erlbaum.
- Horgan, J., Bethell, H., Carson, P., Davidson, C., Julian, D., Mayou, R.A., & Nagle,

- R. (1992). Working party report on cardiac rehabilitation. British Heart Journal, 67, 412-418.
- Hudson, J., Board, E.M., & Lavalley, D. (2001). The role of cardiac rehabilitation in dealing with psychological loss among survivors of a cardiac event. Journal of Loss and Trauma, 6, 301-312.
- Kaufman, M.W., Fitzgibbons, J.P., Sussman, E.J., Reed, J.F., Einfalt, J.M., Rodgers, J.K., & Fricchione, G.L. (1999). Relation between myocardial infarction, depression, hostility and death. American Heart Journal, 138, 549-554.
- Kulik, J.A., & Mahler, H.I.M. (1993). Emotional support as a moderator of adjustment and compliance after coronary artery bypass surgery: A longitudinal study. Journal of Behavioral Medicine, 16, 45-63.
- Ladwig, K.H., Kieser, M., Konig, M., Breithardt, G., & Borggrefe, M. (1991). Affective disorders and survival after acute myocardial infarction: results from the post-infarction late potential study. European Heart Journal, 12, 959-964.
- *Landers, D.M. (2001). The influence of exercise on mental health. PCPFS Research Digest 2, Number 12. ???
- Lane, D., Carroll, D., Ring, C., Beevers, D.G., & Lip, G.Y.H. (2000). Effects of depression and anxiety on mortality and quality of life 4 months after myocardial infarction. Journal of Psychometric Research, 49, 229-238.
- Lear, S.A., & Iganaszewski, A. (2001). Cardiac rehabilitation: A comprehensive review. Current Controlled Trials in Cardiovascular Medicine, 2, 221-232.
- Lesperance, F., & Frasure-Smith, N. (1999). The seduction of death. Psychosomatic Medicine, 61, 18-20.
- Lesperance, F., & Frasure-Smith, N. (2000). Depression in patients with cardiac disease: A practical review. Journal of Psychometric Research, 48, 379-391.

- Lewin, B., Robertson, I.H., Cay, E.L., Irving, J.B., & Campbell, M. (1992). Effects of self-help post-myocardial-infarction rehabilitation on psychological adjustment and use of health services. Lancet, *339*, 1036-1040.
- Lewin, R.J.P., Ingleton, R., Newens, A.J., & Thompson, D.R. (1998). Adherence to cardiac rehabilitation guidelines: A survey of rehabilitation programmes in the United Kingdom. British Medical Journal, *316*, 18-19.
- Lincoln, Y.S., & Guba, E.G. (1985). Naturalistic inquiry. Beverley Hills, CA: Sage Publishing.
- Martinson, E.W. (1989). The role of aerobic exercise in the treatment of depression. Stress Medicine, *3*, 93-100.
- Martinson, E.W., Medhus, A., & Sandvik, L. (1985). Effects of aerobic exercise on depression: A controlled trial. British Medical Journal, *291*, 100.
- Mayou, R.A., Gill, D., Thompson, D.R., Day, A., Hicks, N, Volmink, J., & Neil, A. (2000). Depression and anxiety as predictors of outcome after myocardial infarction. Psychosomatic Medicine, *62*, 212-209.
- McGee, H.M., Hevey, D., & Horgan, J.H. (1999). Psychosocial outcome assessment for use in cardiac rehabilitation service evaluation: A 10-year systematic review. Social Science & Medicine, *48*, 1373-1393.
- Milani, R.V., Lavie, C.J., & Cassid, M.M. (1996). Effects of cardiac rehabilitation and exercise training in patients after major coronary events. American Heart Journal, *132*, 726-732.
- Moos, R.H., & Schaeffer, J.A. (1984). The crisis of physical fitness: An overview and conceptual approach. In R.H. Moos (Ed.), Coping with Physical Illness: New Perspectives (2nd ed.). New York: Plenum.
- Musselmann, D.L., Evans, D.L., & Nemeroff, C.B. (1998). The relationship of

depression to cardiovascular disease: Epidemiology, biology and treatment.

Archives of General Psychiatry, 55, 580-592.

Mutrie, N. (1997). The therapeutic effects of exercise on the self. In K.R. Fox (Ed.),

The physical self: From motivation to well-being (pp. 287-314). Champaign, IL:

Human Kinetics.

Oberman, A. (1995). Exercise and the primary prevention of cardiovascular disease.

American Journal of Cardiology, 55, 10D-20D.

*O'Connor, G.T., Buring, J.E., Yusuf, S., *et al* ALL AUTHOR NAMES NEEDED (1989).

An overview of randomised trials of rehabilitation with exercise after myocardial

infarction. Circulation, 80, 234-244.

Oldridge, N.B., Guyatt, G.H., Fischer, M.E., & Rimm, A.A. (1988). Cardiac

rehabilitation after myocardial infarction: combined experience of randomized clinical

trials. Journal of the American Medical Association, 260, 945-950.

Orwin, A. (1974). Treatment of situational phobia – a case for running. British

Journal of Psychiatry, 123, 95-98.

Pate, R.R., Pratt, M., Blair, S.N., Haskell, W.L., Macera, C.A., Bouchard, C.,

Buchner, D., Ettiger, W., Heath, G.W., King, A.C., Kriska, A., Leon, A.S.,

Marcus, B.H., Morris, J., Paffenberger, R.S., Patrick, K., Pollock, M.L., Rippe, J.M.,

Sallis, J., & Wilmore, J.H. (1995). Physical activity and public health: A

recommendation from the Centers for Disease Control and Prevention and the

American College of Sports Medicine. Journal of the American Medical Association,

273, 402-407.

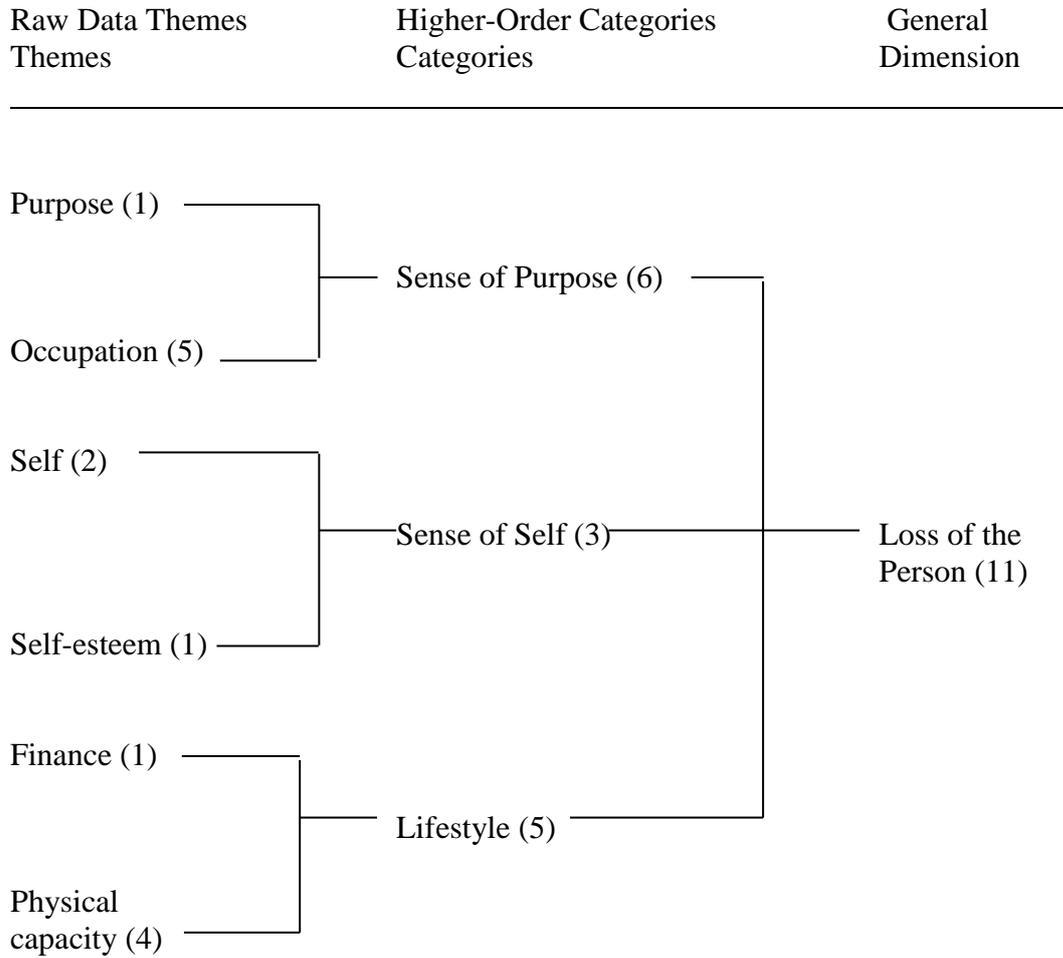
Powell, K.E., & Blair, S.N. (1993). The public health burdens of sedentary habits:

theoretical but realistic estimates. Medicine and Science in Sports and Exercise, 26,

851-856.

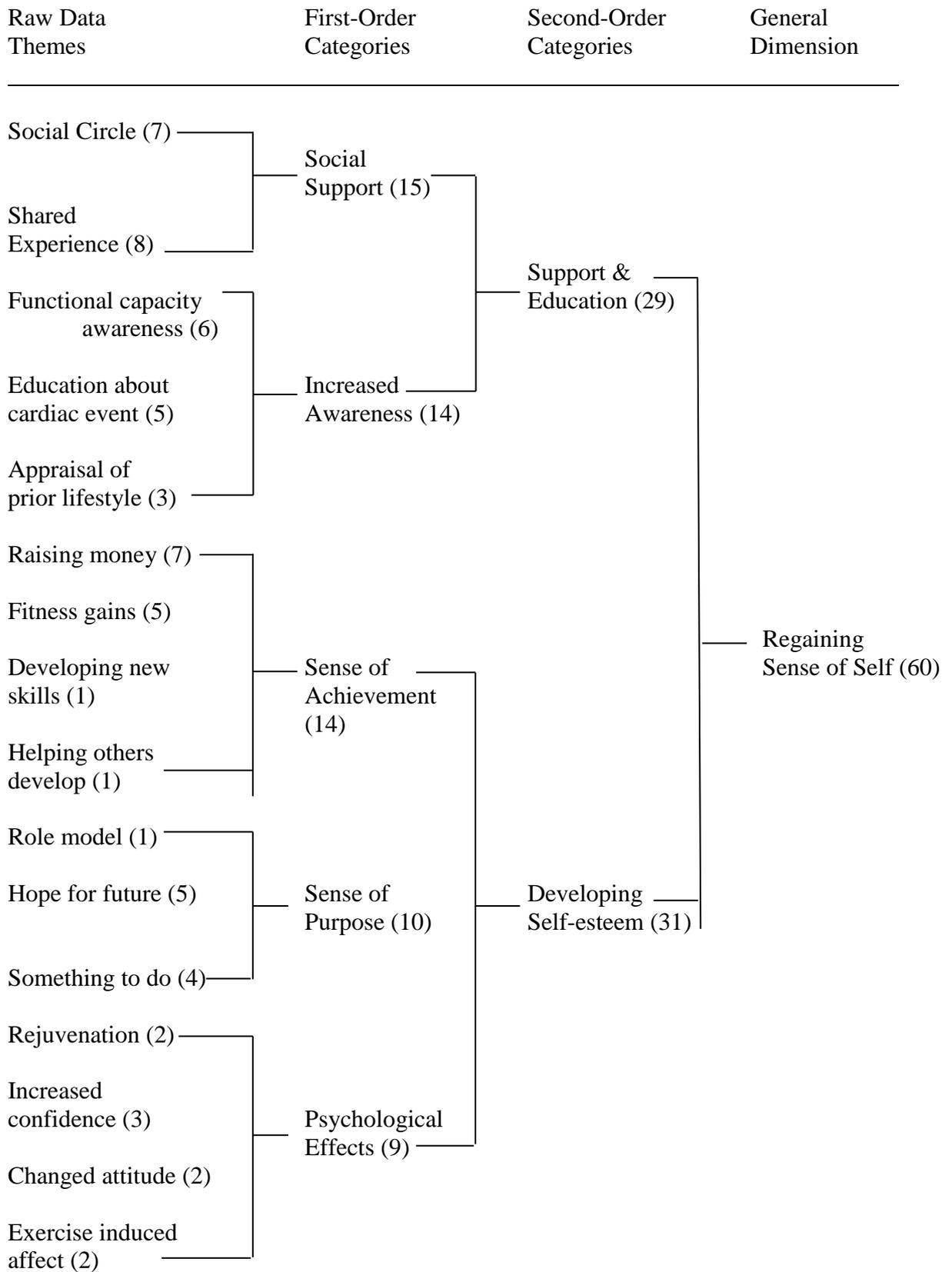
- Saitoh, K., Kobayashi, N., *et al.* (2000). The effects of aerobic training on the emotional response in patients who underwent cardiac surgery. Japanese Journal of Thoracic Surgery, *53*, 742-746.
- Schomer, H.H., & Noakes, T.D. (1983). The psychological effect of exercise training on patients after a myocardial infarction: A pilot study. South African Medical Journal, *64*, 473-475.
- Stokes, W. (1854). Diseases of the Heart and Aorta. Dublin: Hodges and Smith.
- Uniken, Venema-van Uden, M., Zoetewij, M., Erdman, R., van den Berg, G.M., Smeets, J.S., Weeda, H.W.H., Vermeulen, A., van Meurs-van Woezik, H., & Ebink, C. (1989). Medical, social and psychological recovery after cardiac rehabilitation. Journal of Psychosomatic Research, *33*, 651-656.
- Uttal, D.H., & Perlmutter, M. (1989). Toward a broader conceptualization of development: The role of gains and losses across the life-span. Developmental Review, *9*, 101-132.
- World Health Organization (1993). Needs and action priorities in cardiac rehabilitation and secondary prevention in patients with coronary heart disease. Geneva: Author.
- Zigmond, A.S., & Snaith, R.P. (1983). The hospital anxiety and depression scale. Acta Psychiatrica Scandinavica, *67*, 361-370.

Figure 1. Losses incurred due to a cardiac event



Note. Numbers in parentheses indicate amount of raw data items within each theme.

Figure 2. Restoration of losses and gains experienced following cardiac rehabilitation



Note. Numbers in parentheses indicate amount of raw data items within each theme.