

Positive coping and mastery in a rehabilitation setting

Esther R. Greenglass, Sandra Marques, Melanie deRidder and Supriya Behl

The objective of this study was to examine the predictive value of positive coping in relation to behavioral outcomes. Positive coping focuses on goal setting and preparative behavior in response to distress. The participants were 228 in-patients in a rehabilitation hospital following joint replacement. The average age of participants was 67.3 years old, 71% were women and two-thirds were married. Sixty percent had a hip replacement and 40% had a knee replacement. The study was designed so that at Time 1, two scales were used: the proactive coping subscale of the Proactive Coping Inventory and the Getting on with Life scale. Proactive coping measures future-oriented planning and goal-setting strategies that an individual develops when confronting stress. Getting on with Life assesses feelings about resuming activities and social relationships that give one day-to-day pleasure. At Time 2, behavioral outcomes were assessed using the 2-Minute Walk (2MW) Test and a functional independence measure. In the 2MW Test, participants were instructed to walk at a comfortable pace and the distance walked in 2 min was measured in meters. The functional independence measure was based on average ratings of participants' independence behavior by trained hospital personnel in different areas. Results indicated that proactive coping and Getting on with Life were significantly related to behavioral outcomes. In conclusion, the results illustrate the value of positive coping in a rehabilitation setting.

Diese Studie untersucht den klinischen Prädiktwert der positiven Krankheitsbewältigung bzgl. der resultierenden Verhaltensmuster. Eine positive Krankheitsbewältigung ist auf eine Zielsetzung und ein vorbereitendes Verhalten in Erwidern auf Leid und Leiden gerichtet. Bei den Teilnehmern handelte es sich um 228 Patienten, die nach einer Gelenkoperation stationär in einer Reha-Klinik aufgenommen wurden. Die Patienten waren im Schnitt 67,3 Jahre alt, 71% von ihnen waren Frauen, und zwei Drittel waren verheiratet. Bei 60% war ein künstliches Hüftgelenk, bei 40% ein künstliches Knie eingesetzt worden. Gemäß Studienaufbau wurden zu einem gegebenen Zeitpunkt 1 zwei Skalen angewandt: die Unterskala Proaktive Bewältigung des Proaktiven Bewältigungsinventars und die Skala „Das Leben weiterleben“. Im Rahmen der proaktiven Bewältigung werden die zukunftsorientierten Planungs- und Zielsetzungsstrategien gemessen, die Personen in Stresssituationen entwickeln. Dabei werden die Gefühle bewertet, die bei der Wiederaufnahme von Aktivitäten und gesellschaftlichen Beziehungen aufkommen, die einem den Alltag versüßen. Zum Zeitpunkt 2 wurden die resultierenden Verhaltensmuster mit Hilfe des 2-Minuten-Gehtests und einer funktionalen

Unabhängigkeitsmessung beurteilt. Beim 2-Minuten-Gehtest wurden die Teilnehmer angehalten, in einem für sie angenehmen Schrittempo zu gehen. Die in zwei Minuten zurückgelegte Strecke wurde dann in Metern gemessen. Der funktionalen Unabhängigkeitsmessung wurden die von fachlich qualifizierten Mitarbeitern im Krankenhaus gemessenen Durchschnittswerte der Unabhängigkeit der Teilnehmer zu Grunde gelegt. Dabei kam man zu dem Schluss, dass eine proaktive Bewältigung und das Motto „Das Leben weiterleben“ eine enge Beziehung mit dem Verhaltensmuster herstellen. Die Ergebnisse verdeutlichen also den Stellenwert einer positiven Krankheitsbewältigung im Rahmen der Rehabilitation.

El objetivo de este estudio fue examinar el valor predictivo del enfrentamiento positivo con relación a los resultados conductuales. El enfrentamiento positivo se basa en el establecimiento de metas, y en desarrollar conductas que preparen al individuo para enfrentar situaciones de estrés. En el estudio participaron 228 pacientes ingresados en un hospital de rehabilitación tras el reemplazo de una articulación. La edad promedio de los participantes fue de 67.3 años; el 21% de ellos eran mujeres y dos tercios estaban casados. Al 60% le habían realizado un reemplazo de cadera; y al 40%, un reemplazo de rodilla. El estudio se diseñó de manera tal que en el "tiempo 1" se utilizaron dos escalas: la subescala de Enfrentamiento proactivo y el Inventario de enfrentamiento proactivo; se utilizó, además, la escala de Disposición de seguir adelante en la vida. El enfrentamiento proactivo mide los planes futuros y las estrategias de establecimiento de metas de un individuo en situación de estrés. La escala de Disposición de seguir adelante en la vida mide los sentimientos del individuo acerca del reestablecimiento de las actividades y relaciones sociales que le brindan placer de manera cotidiana. En el "tiempo 2" se evaluaron los resultados conductuales utilizando la llamada Prueba de los dos minutos de caminata y una medida de independencia funcional. En la Prueba de los dos minutos de caminata se le pidió a los participantes que caminaran a un paso que les resultara cómodo y se midió la distancia, en metros, que los mismos recorrieron en dos minutos. La medida de independencia funcional se basó en los valores promedios del comportamiento independiente de los participantes, obtenidos por personal calificado del hospital en diferentes áreas. Los resultados indican que el enfrentamiento proactivo y la escala de Disposición de seguir adelante en la vida estuvieron significativamente relacionados con los resultados conductuales. En conclusión, los resultados muestran el beneficio del enfrentamiento positivo en el ámbito de las instituciones de rehabilitación.

L'objectif de cette étude était d'examiner la valeur prédictive de l'attitude positive face à la thérapie pour le comportement résultant. L'attitude positive focalise le patient sur la fixation d'objectifs et le comportement préparatoire en réponse au désarroi. Les participants étaient 228 patients en résidence dans un hôpital de rééducation, à la suite d'un remplacement d'articulation. Leur âge moyen était de 67,3 ans, 71% d'entre eux étaient des femmes et les deux tiers étaient mariés. Il s'agissait dans 60% des cas d'une opération de la hanche et dans 40% du genou. L'étude était conçue de sorte à utiliser pour la période 1 deux échelles de mesure : la sous-échelle "Proactive Coping" du "Proactive Coping Inventory", et l'échelle "Getting on with Life". "Proactive Coping", ou attitude positive proactive, mesure les stratégies de planification et de fixation d'objectifs orientées vers l'avenir développées par un individu face au stress. "Getting on with Life" (désir de reprendre sa vie le plus rapidement possible) évalue les sentiments face à l'idée de reprendre les activités et les relations sociales, source de plaisir au quotidien. Durant la période 2, le comportement a été évalué par le truchement du test de marche de 2 min ("2-Minute Walk Test") et d'une mesure d'indépendance fonctionnelle. Au cours du test de marche de 2 min, il était demandé aux participants de marcher à un rythme

Introduction

Orthopedic replacement of knees and hips is a common surgical procedure aimed at reducing pain and improving physical functioning. Total hip replacement (THR) and total knee replacement (TKR) are frequently used procedures to reduce disability mostly due to osteoarthritis and rheumatoid arthritis. The new prostheses function very well in 90–95% of the patients and do so for as long as 15 years (Branson and Goldstein, 2001). The present research investigates the role of coping in relation to behavioral outcomes in rehabilitation patients who have recently undergone joint replacement surgery.

In their 2003 paper, Ptacek and Pierce (2003) discuss the importance of research that investigates the mechanisms by which coping influences rehabilitation outcomes. Physical rehabilitation may be stressful due to pain, loss of functions, loss of independence, financial worries, uncertainty about the future, and concern about self and loved ones. For rehabilitation patients, physical circumstances may be seen as having infringed on their life. Their response to this may be: (1) to view their situation as hopeless and to give up completely on their life goals or (2) to perceive their situation as a challenge and therefore work hard to overcome it. For most, their reaction would be somewhere between these two extremes.

According to Csikszentmihalyi (1990), individuals who decide to perceive life's misfortunes as challenges come to regard the experience as 'enriching'. Thus, those who do

confortable, et la distance parcourue en mètres en 2 min était mesurée. La mesure d'indépendance fonctionnelle se base sur l'évaluation moyenne du comportement d'indépendance des participants par un personnel hospitalier spécialement formé dans différents domaines. Les résultats indiquent que l'attitude positive proactive et la volonté de reprendre sa vie sont particulièrement liées au comportement résultant. En conclusion, ces résultats illustrent la valeur de l'attitude positive dans un contexte de rééducation. *International Journal of Rehabilitation Research* 28:331–339 © 2005 Lippincott Williams & Wilkins.

International Journal of Rehabilitation Research 2005, 28:331–339

Keywords: positive coping, rehabilitation, life goals

Department of Psychology, York University, Toronto, Ontario, Canada.

Parts of this paper were presented at the 24th International Conference of STAR (Stress and Anxiety Research Society), Lisbon, 10–12 July 2003.

Correspondence and requests for reprints to E. Greenglass, Department of Psychology, York University, 4700 Keele Street, Toronto, Ontario, Canada M3J 1P3.
Tel: +1 416 445 1144; fax: +1 416 736 5814;
e-mail: estherg@yorku.ca

Received 13 January 2005 Accepted 24 March 2005

not despair and work hard at their rehabilitation may be more successful at meeting their goals and may be psychologically healthier. Coping plays an essential role in this process. Lazarus and Folkman (1984) have defined coping as changing cognitive and behavioral efforts to manage psychological stress. Since physical rehabilitation poses a significant challenge, the way individuals cope during it can have significant implications for this process. Considerable research has revealed the importance of coping strategies in rehabilitation (e.g. Carver *et al.*, 1993).

Active coping is one dimension of psychosocial competence. Several studies have found a positive relationship between active coping styles and psychological well-being. An active coping style was a significant predictor of adjustment among adults with rheumatoid arthritis (Brown *et al.*, 1989) and among those who had a spinal cord injury (Frank *et al.*, 1987). Kleinke (1992) found that patients with chronic pain who endorsed self-management and social support as pain coping strategies exhibited better adjustment subsequently on several measures. Patients who endorsed helplessness and medical remedies as pain coping strategies demonstrated poorer adjustment. Applying self-efficacy theory (Bandura, 1977) to rehabilitation, individuals can cope better if they perceive themselves as having the necessary skills and abilities to create positive outcomes. Altmaier *et al.* (1993) found that low back pain patients who received counseling to increase self-efficacy in coping skills had lower self-reported back pain at a 6-month follow-up.

Traditionally coping has been regarded as something that occurs in response to a stressful encounter (reactive coping) and involves undertaking steps to deal with harm resulting from a stressful situation after it has occurred (Schwarzer and Taubert, 2002). Proactive coping is a future-oriented strategy that involves improving and augmenting one's resources to deal with potential stressful encounters before they occur (Greenglass *et al.*, 1999). By coping proactively, patients undergoing physical rehabilitation can expect to draw upon internal and external resources to help them through therapy and achieve treatment goals. Proactive copers endeavor to improve their lives and are more likely to perceive rehabilitation as a tool in improving their life, a notion that is consistent with previous work that has applied self-efficacy to rehabilitation outcomes.

Several studies have focused on identifying predictors of return to work (RTW) in relation to rehabilitation, as seen, for example, in a sample of patients who had work-related upper extremity chronic pain disorders and who had completed a work rehabilitation program (Burton *et al.*, 1997). Gallagher *et al.* (1989) prospectively investigated 150 patients with low back pain over 6 months. Forty-one percent of the sample had returned to work at follow-up. While they found few objective physical variables associated with RTW, age, length of unemployment and psychosocial factors predicted RTW. Research to date indicates the importance of investigating the relationship of rehabilitation, psychosocial factors and life goals following rehabilitation.

During physical rehabilitation, there is usually an increase in independence in daily living activities attributed primarily to rehabilitation. The Functional Independence Measure (FIM) is a widely used measure of documenting outcomes of rehabilitation, including independent behavior (Hamilton *et al.*, 1987). Kelly *et al.* (2000) demonstrated that lower admission FIM scores were significantly correlated with longer hospital stay. The same study reported motor FIM scores significantly improved from admission to discharge and then to 12 weeks after discharge.

The present study

The present study examines the relationship between psychological factors and behavioral outcome measures in a sample of rehabilitation hospital in-patients who have undergone hip or knee replacement surgery. A longitudinal design is employed in which psychological measures were recorded at Time 1, during the participant's hospital stay, and behavioral measures were obtained at Time 2, the day before discharge from hospital.

Psychological factors in this study pertain to patients' coping strategies, and their intentional and motivational factors following rehabilitation. While RTW has been

investigated in relation to rehabilitation in previous research, it has limited applicability for three reasons. First, work, as a sphere of endeavor, is not equally important to all people. Second, a RTW measure has limited value in a sample of individuals over age 60 given that some would have retired or are planning to retire in the near future. Third, RTW following rehabilitation may be confounded by the extent to which one's work is physically demanding.

What is needed is a motivational/intentional concept that transcends specific areas such as work, is equally applicable to all individuals and can be applied to individual goal-setting following rehabilitation. One such concept is 'Getting on with Life' that refers to feelings about resuming activities and social relationships that give people day-to-day pleasure and even joy. A theoretical basis for this construct may be found in self-efficacy theory (Bandura, 1977) that states that cognitive processes can mediate behavioral change. A central concept here is efficacy expectations, including outcome expectancies, defined as knowledge of skills needed for goal attainment, and self-efficacy expectancies, beliefs that one can execute actions needed to achieve a goal. Thus, outcome expectancy would refer to the belief that Getting on with Life would not be difficult if one has the skills to do so and self-efficacy expectancy would refer to the person's perceived probability that he or she could get on with life. Individuals may also differ in the extent to which they want to achieve a goal. Applying these theoretical considerations to the concept of Getting on with Life, there would be three dimensions in the concept of 'Getting on with Life': perceived difficulty, probability and motivation. In the present study, the Getting on with Life scale was developed by constructing items that assessed each of these dimensions (see Appendix).

At Time 2, behavioral outcomes are the 2-Minute Walk (2MW) Test and the FIM. It was hypothesized that higher proactive coping should be associated with higher scores on the Getting on with Life scale. The greater the individual's score on Getting on with Life, the better their performance on outcome measures.

Methods

Participants were 228 in-patients in a rehabilitation hospital following joint replacement. Average hospital stay was 20.9 days (SD = 16.6). Average age of participants was 67.3 years old (SD = 12.1) and 71% of the sample were women. Two-thirds were married. Forty percent of the sample had high school education, 25% had attended a trade school or a community college and close to 30% were university educated. Thirty-two percent indicated that they would probably return to work. Sixty percent had a hip replacement and 40%, a knee replacement. Close to all respondents reported that their living arrangements would be the same after their hospital stay as it was

before. Two-thirds reported living with their spouse, one-quarter of the sample lived alone and approximately 10% lived with relatives or friends.

With regard to co-morbidities, according to hospital policy, if patients were not medically stable or if they had any condition requiring oxygen, they would be judged as not able to actively participate in rehabilitation and they would not be sent to the present rehabilitation hospital. They may have had medical conditions in the past, but patients with these conditions would be admitted only if they were being medically managed. Therefore, regardless of any previous co-morbidity, the patients had to be judged as medically stable. Thus, the hospital population from which the present sample was drawn was sent to this rehabilitation hospital only if they were able to actively participate in rehabilitation. Should they develop a serious problem with co-morbidity during their hospital stay, they would be transferred to an acute care hospital (Personal communication, Annette Marcuzzi, Professional Practice Leader, Physiotherapy, St Johns Rehabilitation Hospital). On average, patients were admitted to the rehabilitation hospital approximately 7 days after their surgery.

Procedure

This study was approved by ethics committees at both York University and the rehabilitation hospital. For ethics approval, participants signed a consent form giving the investigator permission to obtain certain information pertaining to the study.

The procedure involved administering a questionnaire to participants at some time during their hospital stay (Time 1) and assessing their performance on the outcome measures the day prior to their hospital discharge (Time 2). On average, it was 7 days between hospital admission and study recruitment, and 13 days between Times 1 and 2. Prospective participants were identified by asking hospital staff to indicate diagnostic categories of the newly admitted patients. Patients who had joint replacements were randomly approached after the second day of admission to the hospital and asked if they would like to participate in the study.

At Time 1, participants were given a description of the study and were told their participation was voluntary and confidential, and that they could terminate their involvement at any time during the study. After they agreed to participate, they were asked to sign a consent form. A response rate of 79% was obtained. Response rate was computed by dividing the total number of patients who agreed to participate (228) by the total number of participants who were approached (289). No participants were lost to follow-up. Ethics considerations precluded obtaining information on non-consenting patients, thereby preventing any systematic comparisons between

consenting and non-consenting patients. However, hospital data indicate that the present sample was comparable to the joint arthroplasty hospital population in terms of hospital stay which was between 19 and 20 days compared to 20.9 days for the present sample. Secondly, since only patients with medically stable conditions were admitted to this rehabilitation hospital, there were no grounds to believe that the present sample differed significantly, in terms of co-morbidities, from the hospital population in ways that would have affected their rehabilitation treatment or performance.

In the first phase of the study, participants completed a questionnaire that was read and filled out by the interviewer. This method was chosen, rather than self-administering questionnaires, in order to allow participants to ask for clarification when necessary.

The questionnaire

Psychological variables (proactive coping and Getting on with Life) were assessed in a self-report questionnaire that included demographics such as, gender, age, marital status, living arrangements, education and intentions to return to work.

Proactive coping assessment

Proactive coping was assessed using the proactive coping subscale of the Proactive Coping Inventory (PCI; Greenglass *et al.*, 1999) consisting of 14 items ($\alpha = 0.79$). Examples of the items: 'I am a "take charge" person' and 'I turn obstacles into positive experiences.' The response choices for this scale are: (1) not at all true, (2) barely true, (3) somewhat true and (4) completely true. Research has shown significant correlations between proactive coping scores, active coping and internal control (positive), and between proactive coping scores, denial and self-blame (negative) in Canadian university students (Greenglass, 2002). Pasikowski *et al.* (2002) report that proactive coping correlates negatively with depression and positively with reported health in Polish college students.

Getting on with Life scale

This consists of 13 items to assess participants' perceptions about getting on with their lives. This measure has high reliability as seen in its high Cronbach α (0.79). The measure, designed specifically for this study, is based on participants' perceived motivation, difficulty and probability that they would get on with life. This was done by asking patients to indicate their level of agreement with each statement in the scale on a seven-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). Sample items are 'With regard to getting on with my life, I am looking forward to it (perceived motivation)', 'It's going to be difficult for me' (perceived difficulty) and 'It is highly likely' (perceived probability). A total score was

obtained by computing the mean response to the 13 items (see Appendix for the items).

The second phase of the study (Time 2) took place the day before the patient's hospital discharge. At Time 2, patients were assessed by trained hospital personnel on standard outcome measures including the 2MW Test (Cooper, 1968) and the FIM (CIHI, 1999).

Functional independence measure

In Canada, in October 2002, the FIM was mandated by the government to measure the effectiveness of rehabilitation services in rehabilitation settings. The Canadian Institute for Health Information (CIHI) developed the National Rehabilitation Reporting System and purchased the rights to use the FIM from UDSmr (Universal Data Set for Medical Rehabilitation). The results of a Canadian pilot study with a sample of patients from several rehabilitation settings across Canada indicated that the FIM has high reliability and validity (CIHI, 1999).

The FIM was administered by hospital personnel including nurses, occupational therapists, physiotherapists, and speech and language therapists who were required to take three one-half day training sessions. They had to achieve 80% in two tests. The FIM could be completed only by a trained and certified rehabilitation professional. Participants' behaviors in four categories were evaluated on a rating scale from 1, total assistance to 7, complete independence. These are self-care, transfers, locomotion and social cognition. Self-care consists of behavior in the following areas: eating, grooming, bathing, dressing (average of dressing the upper and lower body) and toileting. Transfers from bed, chair, wheelchair, toilet and tub/shower were also assessed. Locomotion assessments are based on ratings using a wheelchair (if relevant), ambulation and stairs. Assessments of social cognition are based on social interaction, problem solving, and memory. Average ratings were obtained in each of these four areas. A single score of independence functioning was obtained by computing the mean of these four scores for each participant.

Two-minute walk test

The 2MW Test was used to measure patients' walking speed and endurance. Endurance was first measured by Cooper (1968), who developed a 12-min running test to measure oxygen uptake in a sample of healthy men. Butland *et al.* (1982) compared the 12-min walk test with shorter versions of 2 and 6 min, and found them to be highly correlated and therefore comparable measures of endurance. The 2MW Test, a widely used measure, has been utilized with different populations where its validity, reliability and responsiveness have been satisfactorily established (Berstein *et al.*, 1994).

Results

Table 1 presents means and SDs for variables in the study.

Table 2 presents correlations among the variables. Proactive coping correlated positively with perceptions of getting on with life, and with number of meters walked in 2 min. Perceptions related to getting on with life were positively related to distance walked in 2 min. Functional independence correlated positively with number of meters walked in 2 min.

Structural equation modeling was used to investigate the relationship between proactive coping, Getting on with Life, functional independence and distance walked in 2 min. In the theoretical model put forth in Fig. 1, proactive coping is seen as contributing directly to Getting on with Life. Getting on with Life is expected to be associated with greater distance walked in 2 min and with greater functional independence. Distance walked in 2 min and functional independence should correlate positively with each other. AMOS version 4.0 (Arbuckle and Wothke, 1999) was used to provide path coefficients and tests of the overall goodness of fit of the theoretical model to the data. The maximum likelihood method of parameter estimation was utilized.

AMOS generates a χ^2 goodness of fit statistic to test the extent to which a hypothesized model is consistent with the data. The χ^2 statistic is the original fit index for structural models and tests the extent to which a hypothesized model is consistent with the data. A small non-significant χ^2 value indicates that the model fits the data well, and that the model and the data are not significantly different from each other. Given the sensitivity of the χ^2 statistic to sample size, a number of alternative absolute fit measures have been proposed. Joreskog and Sorbom (1993) have introduced two absolute fit indices: the Goodness of Fit Index (GFI) and Adjusted Goodness of Fit Index (AGFI). For the GFI,

Table 1 Means and standard deviations for variables

Variable	Mean	SD
2MW	81.76	41.73
FIM	6.29	0.33
Getting on with Life	5.73	0.79
Proactive coping	43.76	5.16

Table 2 Correlation matrix of variables

Variable	1	2	3	4
1 Proactive coping				
2 Getting on with one's life	0.33**			
3 Distance walked in 2 min	0.26*	0.24*		
4 Functional independence	-0.01	0.21	0.35**	

* $P < 0.05$; ** $P < 0.01$.

values of 0.90 or higher indicate a close fit between the model and the data. The AGFI attempts to adjust the GFI for the degrees of freedom (d.f.) of a model relative to the number of variables. Usually, a value of at least 0.90 is required to accept the model. Another widely used index is the Root Mean Square Error of Approximation (RMSEA). The RMSEA is designed to estimate the lack of fit of a model to the population covariance matrix. If the approximation is good, the RMSEA should be small. Browne and Cudek (1993) suggest that a RMSEA value of 0.05 and less indicates a close fit, and values of 0.08 and less represent reasonable fit. PCLOSE is the *P*-value, provided by AMOS, for testing the null hypothesis that the RMSEA is no greater than 0.05.

Two well-known incremental indices of fit assessment are the Normed Fit Index (NFI; Bentler and Bonett, 1980), and the Comparative Fit Index (CFI; Bentler, 1990). The NFI and CFI are both based on a comparison of the hypothesized model against a baseline model, typically the independence model. Similar to the GFI and AGFI, values for the NFI and CFI greater than 0.90 are generally considered acceptable. AMOS generates β values that provide indices of directional relationships among constructs. Generally the path models assessed in structural equation modeling imply causal relationships among constructs depending on the study's design.

In the present study, the independence χ^2 [χ^2 (6, *n* = 88) = 33.570, *P* < 0.001] confirmed the presence of inter-correlations in the data and, therefore, its suitability for the analysis. The χ^2 goodness of fit statistics [χ^2 (2) = 5.286, *P* = 0.071] indicated that the model provided an adequate fit to the data. Although the goodness of fit index was satisfactory (GFI = 0.971), other indices provided by

AMOS indicated that the fit between the model and the data could be improved (AGFI = 0.857, NFI = 0.843, CFI = 0.881, RMSEA = 0.137, PCLOSE = 0.113).

In an attempt to develop a better fitting model, *post hoc* modification indices were examined. Only one modification index was suggested – a path from proactive coping to number of meters walked in 2 min. Adding this path provided an improved fit of the data to the model. Table 3 displays the goodness of fit indices for the initial model and for the revised model where a path was added from proactive coping to number of meters walked in 2 min.

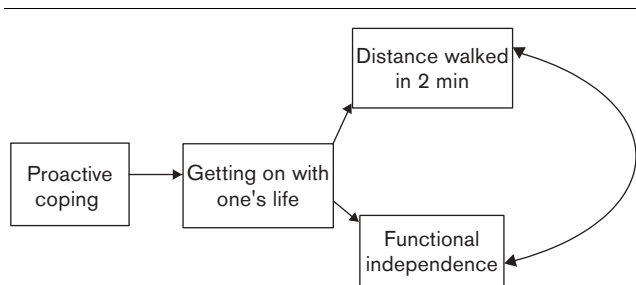
As illustrated in Fig. 2, proactive coping was associated with distance walked in 2 min ($\beta = 0.22$). Proactive coping was related to getting on with life ($\beta = 0.33$). Proactive coping was indirectly related to functional independence through getting on with life ($\beta = 0.33^* \beta = 0.21$).

Discussion

Results of this study demonstrate that psychological factors are significant predictors of behavioral outcomes in rehabilitation patients. Specifically, the data showed that the way patients cope with stress during their hospital stay plays an important role in their subsequent performance on outcome measures on the day prior to hospital discharge. Results of structural equation modeling showed that proactive coping was related in both direct and indirect ways to outcome measures.

The data showed that proactive coping predicted positively to distance walked in the 2MW Test. The more participants reported using proactive coping, the greater the distance they walked in 2 min. Proactive coping was also indirectly related to functional independence. Specifically, perceptions related to Getting on with Life mediated the relationship between proactive coping and functional independence. Thus, the more proactive coping was employed, the greater the perception of wanting to get on with life. Further, the greater the perception of wanting to get on with life, the greater the person's functional independence. The direct relationship between proactive coping and distance walked is illustrated when the specific items of the proactive subscale are examined. Examples of these items are 'I like challenges and beating the odds', 'I always try to find a way to work around obstacles, nothing really stops me' and 'I turn obstacles into positive experiences'. When proactive coping is applied to the rehabilitation situation, proactive

Fig. 1



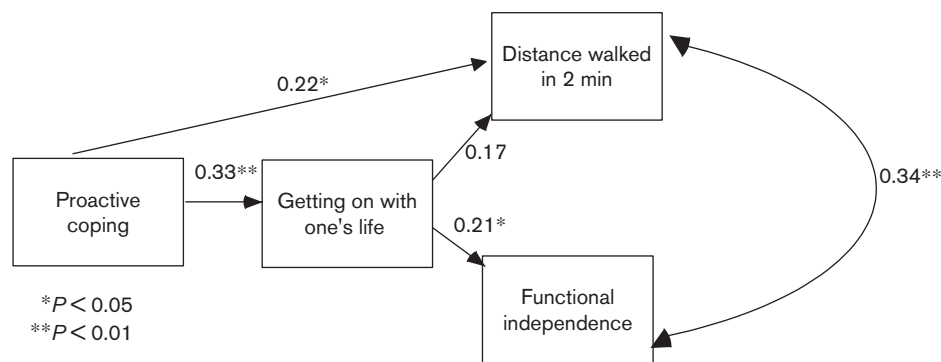
Structural model.

Table 3 Goodness of fit indices for models

Model	χ^2	d.f.	<i>P</i>	GFI	AGFI	NFI	CFI	RMSEA	PCLOSE
Initial model	5.286	2	0.071	0.971	0.857	0.843	0.881	0.137	0.113
Revised model ^a	0.544	1	0.461	0.997	0.969	0.984	1.00	0.000	0.508

^aIdentical to the initial model, except that a path from proactive coping to distance walked in 2 min was added.

Fig. 2



Revised model. Figures on the arrows indicate β values.

individuals are more likely to perceive rehabilitation as a challenge rather than a stressor and to view goal setting as an integral part of coping. This perception is translated into behavior; specifically, walking further during the 2MW Test. Thus, proactive coping would appear to function on an incentive level, motivating the patient to walk farther during the test, probably due to the perception of the test as a challenge to be mastered. These findings parallel previous research. For example, one of the consistent findings with patients who have arthritis is that certain passive responses (i.e. sleeping more or restricting one's activities) appear maladaptive in that their use is associated with poor psychological adjustment, while maintaining one's activities, in spite of pain, are seen as more adaptive behaviors (Zautra and Manne, 1992).

Additional data indicate that proactive coping contributes to greater perceived motivation to get on with one's life. Thus, to the extent that participants reported using proactive coping strategies, they had higher scores on the Getting on with Life scale. Wanting to get on with their lives contributed to greater total independence functioning. Thus, the data suggest that wanting to resume activities and get on with life motivate patients to engage in behavior that promoted greater independence functioning.

The present findings illustrate the importance of incorporating psychological factors into the investigation of rehabilitation outcomes and parallel previous research. For example, research indicates that being optimistic about the future (Carver *et al.*, 1993), believing in the efficacy of the rehabilitation program (Resnick, 2002) and being happy with the rehabilitation goals offered to them (Valach and Wald, 2002) were related to better rehabilitation outcomes in patients. In the present study, participants may have perceived that getting on with life was a prerequisite for being able to perform daily activities independently during rehabilitation. On the basis of a review of 917 study abstracts, Sivaraman Nair

(2003) reports that incorporation of a participant's life goals into a management program resulted in better outcomes in various physical and psychiatric disorders. Life goals influenced participants' motivation to engage in rehabilitation programs.

As expected, the outcome variables were related to each other. Thus, the more meters walked in the 2MW Test, the higher the independence functioning scores assigned by trained hospital personnel. These findings contribute to the validity of both measures, suggesting that walking farther in the 2MW Test is related to greater ability to independently perform daily activities.

Conclusions

Taken together, the present data indicate an interrelationship among cognitive, motivational and behavioral systems that contribute to greater effective coping with the challenge of physical rehabilitation. Moreover, the findings of the structural equation model showing that psychosocial factors predicted future behavioral outcomes indicate that rehabilitation treatments need to incorporate psychological factors into their programs.

Acknowledgements

Grateful acknowledgement is due to St John's Rehabilitation Hospital, Toronto and The Faculty of Arts, York University, Toronto for their support of this project. Thanks are due to Lisa Fiksenbaum, Nobuko Takeuchi, Elaine Murphy and Donna Barker for their assistance in this research.

References

- Altmaier EG, Russell DW, Kao CF, Lehmann TR, Weinstein JN (1993). Role of self-efficacy in rehabilitation outcome among chronic low back pain patients. *J Couns Psychol* 40:335-339.
- Arbuckle JL, Wothke W (1999). *Amos 4.0 User's Guide*. Chicago: SPSS.
- Bandura A (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychol Rev* 84:191-215.

- Bentler PM (1990). Comparative fit indexes in structural models. *Psychol Bull* **107**:238–246.
- Bentler PM, Bonett DG (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychol Bull* **88**:588–606.
- Berstein ML, Despars JA, Singh NP, Avalos K, Stansbury DW, Light RW (1994). Reanalysis of the 12-Min Walk in patients with chronic obstructive pulmonary disease. *Chest* **105**:163–167.
- Branson JJ, Goldstein WM (2001). Sequential bilateral total knee arthroplasty. *AORN J* **73**:610–626.
- Brown GK, Nicassio PM, Wallston KA (1989). Pain coping strategies and depression in rheumatoid arthritis. *J Consult Clin Psychol* **57**:652–657.
- Browne M, Cudeck R (1993). Alternative ways of assessing model fit. In: Bollen KA, Long J (editors): *Testing structural equation models*. Newbury Park: Sage. pp. 136–162.
- Burton K, Polatin PB, Gatchel RJ (1997). Psychosocial factors and the rehabilitation of patients with chronic work-related upper extremity disorders. *J Occup Rehabil* **7**:139–153.
- Butland RJA, Pang J, Gross ER (1982). Two-, six- and twelve min walking tests in respiratory disease. *Br Med J (Clin Res Ed)* **284**:1607–1608.
- CIHI (1999). *Rehabilitation data standards for Canada, Pilot Project Report*. Ottawa: Canadian Institute for Health Information.
- Carver CS, Pozo C, Harris SD, Noriega V, Scheier M, Robinson DS, et al. (1993). How coping mediates the effect of optimism on distress: A study of women with early stage breast cancer. *J Pers Soc Psychol* **65**:375–390.
- Cooper KH (1968). A means of assessing maximal oxygen intake. *J Am Med Assoc* **203**:201–204.
- Csikszentmihalyi M (1990). *Flow: The psychology of optimal experience*. New York: Harper & Row.
- Frank RG, Umlaut RL, Wonderlich SA, Askanazi GS, Buckelew SP, Elliott TR (1987). Differences in coping styles among persons with spinal cord injury: a Cluster-analytic approach. *J Consult Clin Psychol* **55**:727–731.
- Gallagher RM, Rauh V, Haugh LD, Milhous R, Callas PW, Langelier R, et al. (1989). Determinants of return-to-work among low back pain patients. *Pain* **39**:55–67.
- Greenglass ER (2002). Proactive coping. In: Frydenberg E (editor): *Beyond coping: meeting goals, vision and challenges*. London: Oxford University Press. pp. 37–62.
- Greenglass ER, Schwarzer R, Taubert S (1999). The Proactive Coping Inventory (PCI): a multidimensional research instrument. [On-line publication]. <http://www.psych.yorku.ca/greenglass/>.
- Hamilton BB, Granger CV, Sherwin FS, Zielezny M, Tashman JS (1987). A uniform national data system for medical rehabilitation. (Chapter 10). In: Fuhrer MJ (editor): *Rehabilitation outcomes: analysis and measurement*. Baltimore: Brookes. pp. 137–147.
- Joreskog KG, Sorbom D (1993). *LISREL 8: structural equation modeling with the SIMPLIS command language*. Chicago: Scientific Software International.
- Kelly K, Malone B, Hempel P, Voaklander DC (2000). Orthopedic subacute rehabilitation – Predictors of functional outcome and resource utilization. *Int J Rehabil Health* **5**:165–176.
- Kleinke CL (1992). How chronic pain patients cope with pain: Relation to treatment outcome in a multidisciplinary pain clinic. *Cognit Ther Res* **16**:669–685.
- Lazarus RS, Folkman S (1984). *Stress, appraisal, and coping*. New York: Springer.
- Pasikowski T, Sek H, Greenglass E, Taubert S (2002). The Proactive Coping Inventory – Polish adaptation. *Polish Psychol Bull* **33**:41–46.
- Ptacek JT, Pierce GR (2003). Issues in the study of stress and coping in rehabilitation settings. *Rehabil Psychol* **48**:113–124.
- Resnick B (2002). Geriatric rehabilitation: the influence of efficacy beliefs and motivation. *Rehabil Nurs* **27**:152–163.
- Schwarzer R, Taubert S (2002). Tenacious goal pursuits and striving toward personal growth: Proactive coping. In: Frydenberg E (editor): *Beyond coping: meeting goals, visions and challenges*. London: Oxford University Press. pp. 19–35.
- Sivaraman Nair KP (2003). Life goals: the concept and its relevance to rehabilitation. *Clin Rehabil* **17**:192–202.
- Valach L, Wald J (2002). Action theoretical perspective in rehabilitation. In: Valach L, Young RA, Lynam MJ (editors): *Action theory: a primer for applied research in the social sciences*. Westport: Praeger. pp. 173–197.
- Zautra AJ, Manne SL (1992). Coping with rheumatoid arthritis: a review of a decade of research. *Ann Behav Med* **14**:31–39.

Appendix: Getting on with Life scale

During rehabilitation, people sometimes talk about ‘getting on with their lives’. While this may mean different things to different people, in general getting on with one’s life refers to resuming activities and social relationships that give us day-to-day pleasure and even joy. In the questions below indicate your feelings about ‘getting on with your own life’ by circling the number next to each statement that best describes your feelings.

	Strongly disagree	Moderately disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Moderately agree	Strongly agree
	1	2	3	4	5	6	7
1. I am looking forward to it.							
2. There are a lot of problems.*							
3. It's going to be difficult for me.*							
4. It will be easy for me to do.							
5. It is very unlikely.*							
6. I am not looking forward to it.*							
7. I foresee that it will be a hard thing to do.*							
8. I will do it in time.							
9. I would very much like to do it.							
10. It is highly likely.							
11. I can overcome the problems.							
12. I don't want to proceed with it now.*							
13. I don't see that it is possible.*							

*Reverse scoring.