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Differential outcomes to a pain management programme based on coping style

Eva McMorrow

University College Dublin

Rosemary Walsh & Declan O'Keefe

St Vincent's University Hospital

Barbara Dooley, Suzanne Guerin & Alan Carr

University College Dublin

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ca.lewis@ulster.ac.uk

Correspondence address: Professor Alan Carr, School of Psychology, Room F204,
Newman Building, University College Dublin, Belfield, Dublin 4, Ireland.

email: alan.carr@ucd.ie: **Phone:** +353-1-716-8740.

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ABSTRACT

Objectives: To investigate whether a heterogeneous sample of Irish chronic pain patients could be classified into subgroups using the Multidimensional Pain Inventory (Kerns, Turk, & Rudy, 1985), to profile the subgroups experiences of pain and distress, and to compare their responses to a multidisciplinary pain management programme.

Method: Ninety chronic pain patients completed the Multidimensional Pain Inventory (MPI), the McGill Pain Questionnaire (MPQ), and the Hospital Anxiety and Depression Scale (HADS) before and after a multidisciplinary pain management programme and at 6-23 months follow-up.

Results: Eighty eight percent of patients were classified as Dysfunctional (DYS), Interpersonally Distressed (ID), or Adaptive Coper (AC) on the basis of their responses to the MPI. The proportions of patients classified into the three MPI groups were similar to those found in previous studies: 21% were AC, 20% were ID, and 47% were DYS. The three groups differed significantly in their levels of pre-treatment pain and distress. Compared with the AC group, the DYS group had greater pain and both the DYS and ID groups had greater distress. For measures of pain intensity and interference, from pre- to post-treatment, the DYS group improved significantly more than the AC group, but for pain intensity, the DYS group had relapsed at follow-up and the AC group's interference scores had significantly improved. All patients who participated in the programme showed significant improvement in depression and the sense of control they had over their lives; this improvement was partially maintained at follow-up; and participants expressed a high level of satisfaction with all aspects of the programme.

Conclusions: Irish chronic pain patients are not a homogeneous group and may be classified into subgroups based on psychological factors. Treatment response may be

related to subgroup membership. Future research should evaluate whether tailoring treatments to patient characteristics will improve treatment outcome.

INTRODUCTION

Chronic pain persists beyond the normal time of healing, or lasts more than 3-6 months (Bonica, 1953; Melzack & Wall, 1988). It is differentiated from acute (short-lived) pain, which is usually associated with recent injury and stops with the process of healing.

Chronic pain may be preceded by an episode of acute pain but despite medical care and healing time, the pain persists. Frequently there is no clear physiological or pathological basis and the underlying cause for the pain is unknown. In an epidemiological study of common pain conditions among adults in a health maintenance organisation in the US, von Korff, Dworkin, LeResche, and Kruger (1988) found that the prevalence of recurrent episodes of pain was 37%, with 8% reporting severe, persistent pain. Reported incidence rates of chronic pain in the community range from 16-82 % (Brattberg, Thorslund, & Wikman, 1989; Croft, Rigby, Boswell, Schollum, & Silman, 1993; Crook, Rideout, & Browne 1984; Cunningham & Kelsey, 1984; Jacobsson, Lindgarde, & Manthorpe, 1989; James, Large, Bushnell, & Wells, 1991). Chronic pain is one of the most serious, but poorly understood health problems facing modern society, and the associated physical, psychological, social, and financial costs can be enormous.

Multidisciplinary treatment programmes for chronic pain are typically provided at specialist pain treatment facilities and include medical treatments, cognitive-behavioural approaches, and physical or occupational therapy. Numerous reviews support the efficacy of such treatment (Becker, Sjogren, Beck, Olsen, & Eriksen, 2000; Fishbain, Rosomoff, & Goldberg 1993; Mayer, Gatchel, Polatin, Evans, & Trent, 1999; Sanders & Brena, 1993; White & Harth, 1996). However, despite demonstrated improvements on a variety of outcome variables, there are many studies that report considerable variability in patients' responses to treatment (Turk, Okifuji, Sinclair, & Starz, 1998). In addition, although the effect sizes of most cognitive-behavioural treatments for chronic pain are similar to those in

psychopathology, they are quite modest (around 0.5), and the benefits of pain programmes decrease over time (Chapman, Jameson, Sanders, Lyman, & Lynch, 2000).

In order to understand the heterogeneity of responses that chronic pain patients show to treatment, some authors have attempted to classify chronic pain patients into subgroups. Turk and Rudy (1987) were the first to develop a classification system based on the empirical integration of physical, psychosocial, and behavioural data. Their Multiaxial Assessment of Pain Patients was based on the idea that certain patterns of psychosocial and behavioural assessment data recur in chronic pain patients, and that these patterns represent homogeneous subgroups of patients somewhat independent of medical diagnosis. They identified three separate patient profiles using the Multidimensional Pain Inventory (MPI; Kerns, Turk, & Rudy, 1985; Turk & Rudy, 1988): Adaptive Copers (AC), Interpersonally Distressed (ID) and Dysfunctional (DYS). The DYS group, was characterised by high levels of pain severity, psychological distress, and life interference; and low levels of daily activity and perceived life-control. In contrast the AC group, had low levels of pain severity, psychological distress, and life interference; and high levels of daily activity and perceived life-control. The ID group was characterised by intermediate levels of pain, distress and life interference; but their distinctive feature was they perceived their families to be unsupportive of them and their pain problems. The 3 subgroups did not differ in physical functioning, or in the prevalence of various symptoms, suggesting that the psychosocial dimensions of chronic pain syndromes were independent of physical pathology. Turk and Rudy (1988) found 29.5%, 27.9%, and 42.6% of chronic pain patients fell into the AC, ID, and DYS groups respectively.

Many studies have validated the MPI classification across patient subgroups such as chronic low back pain patients (Carmody, 2001; Johansson & Lindberg, 2000; Turk & Rudy, 1990), patients with fibromyalgia syndrome (Turk, Okifuji, Sinclair & Starz, 1996),

temporomandibular disorder (TMD) (Rudy, Turk, Zaki, & Curtin, 1989; Turk & Rudy, 1990), headache (Walter & Brannon, 1991; Turk & Rudy, 1990), spinal pain (Bergstrom, Bodin, Jensen, Linton, & Nygren, 2001) and physical therapy outpatients (Hankin, Spencer, Kegerreis, Worrell, & Rice, 2001). In addition, a limited number of studies have evaluated the differential responsiveness of the subgroups to standardised pain treatments. Rudy, Turk, Kubinski, & Zaki, (1995) found that the DYS subgroup showed significantly greater improvements in pain intensity, perceived impact of TMD symptoms on their lives, depression, and negative thoughts, compared with the ID and AC groups. Similarly in a study of outpatients with fibromyalgia, Turk et al. (1998) found that the DYS group showed significant reductions in pain, distress, perceived disability, and perceived interference of pain. The AC group showed significant improvements in pain, but no change in distress or disability, and the ID group had a generally poorer response to treatment. Although these studies lend support to the classification system, there are others that have failed to replicate the groups (Beck, Chase, Beriford, & Taegtmeyer 1992; Widerstrom-Noga, Duncan, & Turk, 2004), or to show any relationship between group membership and treatment outcome (Bergstrom, Jensen, Bodin, Linton, & Nygren, 2001; Gatchel et al., 2002; Walen, Cronan, Serber, Groessl, & Oliver, 2002).

To date, only one study on the MPI classification of chronic pain patients has been conducted in Ireland (Collins, Carr & O'Keefe, 1998). In this study the proportions of cases classified as DYS, ID and AC were 46.8%, 28.1% and 25.0% respectively. All three groups showed a similar treatment response, characterized by a significant reduction in depression (Collins, Carr, & O'Keefe, 1998). However, this was a small (N=32) study, without adequate power to detect differences in the responses of groups to treatment. Clearly, a larger study is required to more reliably assess the prevalence of the 3 MPI subgroups, within an Irish context, and their differential responsiveness to treatment. The

present study aimed to fill this gap in our knowledge. There were three main hypotheses. First, it was expected that the proportions of patients in each of the three MPI groups would be similar to those of previous studies, with 20-30% of cases in the AC and ID groups, and 40-50% of cases in the DYS group. Second, it was expected that the DYS and ID groups would report greater pre-treatment pain severity and psychological distress than the AC group. The third hypothesis was that the DYS group would show greater improvement on measures of pain, psychological distress, interference and life-control compared with the AC group. An additional aim of the study was to evaluate the overall effectiveness of the Pain Management Programme at St. Vincent's University Hospital in Dublin.

METHOD

Pain management programme

The Pain Management Programme at St. Vincent's University Hospital in Dublin is a multidisciplinary multimodal group intervention for individuals with chronic, non-malignant or benign pain. The programme is based at a specialist rehabilitation centre attached to a large university hospital in a capital city with a population of 1.3 million and is run on an outpatient bases over 3 weeks from 9.00 am to 4.00 pm daily. In the present study, preliminary multidisciplinary screening of referrals was conducted and all participants were assessed to have chronic intractable, benign, pain. The programme was conducted by a multidisciplinary team which included a pain physician, clinical psychologist, physiotherapist, and occupational therapist. The programme employs a cognitive-behavioural therapeutic approach and includes modules of physiotherapy, occupational therapy, group discussion, life skills, relaxation therapy and pain management lectures. The psychological module of the programme consists of communication skills training,

stress management, anger management, cognitive therapy, relaxation training, and individual pain counselling.

Participants

Ninety chronic pain patients who had completed the multidisciplinary pain management programme at Saint Vincent's University Hospital in Dublin participated in the study.

Participants were literate adults with chronic, intractable, benign pain. Cases under 18 years; those attending other psychosocial programmes; and cases with a psychological condition (other than anxiety or depression), severe enough to prohibit participation in the programme, were excluded. The 90 participants constituted 74% of a complete cohort of 121 patients who attended the programme between 2001 and 2004, and for whom at least six months had elapsed since completing it. Of the remaining 31 patients, 7 refused to participate and for 24, missing data prevented inclusion in analyses.

Thirty-one percent of participants were males and 68% were females. The average age of participants was 42 years (SD = 10.1 years, Range = 23 - 65 years). The average duration of pain was 87 months or just over 7 years (SD = 83.56 months, Range = 8 months – 30 years). Regarding the number of pain sites, 68% of participants had 3 or more pain sites, 21% had two pain sites, 9% had a single pain site, and data were missing for 2% of cases on this variable. The onset of pain was associated with road traffic accidents in 36% of cases; an accident at work in 27% of cases; an accident in a public place in 4% of cases; surgery or dental work in 7% of cases; childbirth in 1% of cases; a virus in 2% of cases; and with other reasons in 24% of participants. Fifty-four percent of participants were unemployed; 26% were employed; 5% were on sick leave from work; 2% were working within the home; and 4% were retired. The employment status was unknown for 9% of participants. At pre-treatment assessment, 40% of participants were involved in a

litigation case associated with their pain; 31% were not involved in litigation, and the litigation status was unknown for the remaining participants. Seventy-seven percent of participants were taking prescribed pain medication.

Instruments

The Multidimensional Pain Inventory (MPI, Kerns et al., 1985). The MPI is a 52-item inventory that assesses the psychosocial effects of chronic pain. It yields scores for the following subscales: life interference due to pain, perceived life control, perceived social support, punishing responses of others, solicitous responses of others, distracting responses of others and participation in daily activities. In the present study the MPI subscales were scored, and cases classified as AC, ID or DYS, with Version 3.0 of the MPI computer scoring programme (Rudy, 2005). In this programme a multivariate discriminant model was used to classify each case into one of the three empirically-derived prototypic MPI profiles, or to indicate if none of these profiles accurately explained the case's MPI subscale scores. The MPI subscales have good internal consistency reliability, with subscale alpha reliability coefficients ranging from .7 to .9. Test-retest reliability coefficients over a 2 week period range from .6 to .9. The validity of the MPI has been supported by the results of exploratory and confirmatory factor-analyses (Turk & Rudy, 1990).

The McGill Pain Questionnaire (MPQ, Melzack, 1975). The MPQ is a widely used self-report pain questionnaire. Respondents are asked to choose descriptors which best correspond to their present pain experience from a set of 78 adjectives. This measure also elicits information on the patient's medical history, cause and location of pain, diagnosis, treatment, pain pattern and accompanying symptoms. In the present study, the number of words chosen to describe the pain experience, the total pain rating index, and the present pain intensity were used in statistical analyses. Several studies support the construct, concurrent, and predictive validity of the MPQ (Dubuisson & Melzack, 1976; Melzack, 1975; Reading, 1983)

along with its test-retest reliability (Melzack, 1975). In addition, various studies show that the MPQ is sensitive to interventions designed to reduce pain (Briggs, 1996; Burchiel et al., 1996; Eija, Tasmuth, & Pertti, 1996).

Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). This 14-item self-report questionnaire assesses depression and anxiety in patients with physical illness. To insure that scores are independent of physical illness, the depression items of the HADS make no reference to physical problems (Zigmond & Snaith, 1983). Both the anxiety and depression subscales have good internal consistency reliability. Inter-item correlations on the anxiety scale range from .4 to .7, and from .3 to .6 for the depression scale (Zigmond & Snaith, 1983). The scale has good criterion and construct validity (Bjelland, Dahl, Haug, & Neckelmann, 2002). Low misclassification rates have been reported (Aylard, Googing, McKenna, & Snaith, 1987; Zigmond & Snaith, 1983) and correlations with other well-known depression and anxiety scales range from .67 to .77 (Aylard et al. 1987). The HADS is also sensitive to change arising from treatment (Herrmann, 1997).

Chronic Pain Management Programme Evaluation Form (CPMPEF, Walsh, 1998). The Chronic Pain Management Programme Evaluation Form assesses patient satisfaction with the pain management programme at Saint Vincent's University Hospital, Dublin. It inquires about the seven main programme components: physiotherapy, occupational therapy, group discussion, life skills, relaxation therapy, lectures and family day. Quantitative ratings are made by participants on seven 11 point rating scales (0 to 10). In addition, participants are invited to comment on each component of the programme, stating which aspects of the programme they liked or disliked.

Procedure

This study was conducted with the ethical approval of involved institutions, consent of all participants, and in conformity with the Psychological Society of Ireland's ethical practice code. Patients who attended the Pain Management Programme at Saint Vincent's Hospital, Dublin between 2001 and 2004 and from whom follow-up data could be collected reflecting a post-programme period of 6 months or longer, were invited to participate. As a routine procedure, all patients who had attended the pain management programme completed the MPI, MPQ, and HADS before and after the programme and the CPMPEF at the end of the programme.

Potential participants were posted an information sheet about the study, a consent form, a package of follow-up questionnaires which included the MPI, MPQ, and HADS and a stamped addressed envelope for returning completed questionnaires. Those who wished to participate in the study completed and returned the consent form and follow-up questionnaires. The consent form gave the research team permission to use the information in the follow-up questionnaires and the pre- and post-programme assessment questionnaires, which were already completed and contained in patients' hospital files. Approximately two weeks after the packs were posted, a follow-up phone call was made to ensure patients had received their packs and to remind them about the study. One consequence of initiating the study in 2005 and using archival data from the period 2001-2004, is that there was large variability in follow-up data ranging from 6 - 23 months.

RESULTS

Data Management

Cases were classified into AC, ID and DYS, groups using Version 3.0 of the MPI Computer Scoring programme. The statistical significance of differences between the three MPI subgroups on demographic characteristics and clinical scales prior to treatment

was evaluated using one-way ANOVAs, with Scheffe post-hoc tests for continuous variables, and Chi Square tests for categorical variables. To compare the three MPI subgroups responses to treatment, a series of 3 X 3, Group X Time ANOVAs was carried out. Where significant main effects were found, appropriate post-hoc tests and tests of simple effects were conducted. There was the possibility that the 3 MPI groups differential responses to treatment could have been due to pre-treatment intergroup differences on a number of variables. Of these, pain duration was the confounding variable of greatest importance. To control for this confounding variable, 3 X 3, Group X Time, ANCOVAs were conducted with pain duration as the covariate, in those instances where ANOVAs yielded significant Group X Time interactions.

Classification and pre-treatment comparison

Nineteen (21.1%) participants were classified as AC, 18 (20%) as ID, and 42 (46.7%) as DYS. Seven (7.8%) were classified as hybrid, 2 (2.2%) as unanalysable, and 2 (2.2%) as anomalous. These 11 anomalous, hybrid, and unanalysable profiles were not included in subsequent analyses.

There were no significant pre-treatment differences between the AC, ID, and DYS groups on gender, marital status, number of children, living arrangements, employment status, litigation status, number of pain sites, pain onset, and medication usage. There were significant differences between groups on age ($F = 4.06$; $df = 2, 76$; $p < .05$; AC > DYS) and pain duration ($F = 4.92$; $df = 2, 72$; $p < .05$; AC > DYS). The AC group was significantly older and reported significantly longer pain duration than the DYS group. The mean ages of the AC, ID and DYS groups were 47.89 (SD = 10.33), 42.17 (SD = 8.79), and 40.19 (SD = 9.95) years respectively. The mean duration of pain of the AC, ID and

DYS groups were 138.35 (SD = 132.77), 76.59 (SD = 57.45), and 67.56 (SD = 54.72) months respectively.

The results of one-way ANOVAs followed by post-hoc tests showed that the means of the three groups at Time 1 before treatment, which are given in Table 1, differed significantly on all MPI, MPQ, and HADS and scales.

On the MPI the groups differed significantly on Interference ($F = 12.34$; $df = 2, 75$; $p < .001$; $AC < ID = DYS$), Self/Life Control ($F = 12.05$; $df = 2, 75$; $p < .001$; $AC > ID = DYS$), Support ($F = 45.82$; $df = 2, 73$, $p < .001$; $AC = DYS > ID$), Punishing Responses ($F = 12.26$; $df = 2, 73$; $p < .001$; $AC = DYS < ID$), Solicitous Responses ($F = 23.67$; $df = 2, 73$; $p < .001$; $AC = DYS > ID$), Distracting Responses ($F = 22.92$; $df = 2, 73$, $p < .001$; $AC = DYS > ID$), and General Activity ($F = 4.26$; $df = 2, 75$; $p < .05$; $AC > DYS$) scales.

On the MPQ, the groups differed significantly on the Number of Words Chosen scale ($F = 4.23$; $df = 2, 76$; $p < .05$; $AC < DYS$), the Total Pain Rating Index ($F = 4.07$; $df = 2, 76$; $p < .05$, $AC < DYS$) and the Present Pain Intensity scale ($F = 10.41$; $df = 2, 65$; $p < .001$; $AC = ID < DYS$).

On the HADS, the groups differed significantly on both the Anxiety ($F = 11.27$; $df = 2, 76$; $p < .001$; $AC < DYS$) and Depression ($F = 8.26$; $df = 2, 75$; $p < .01$; $AC < ID = DYS$) scales.

From these analyses it is clear that the three MPI subgroups had distinctive profiles. Compared with the DYS group, the AC group reported less pain on three MPQ scales; less anxiety and depression on the HADS; less interference on the MPI; and more life control and general activity on the MPI. Compared with the AC and DYS groups, the ID group reported less support, solicitous and distancing responses, and more punishing responses on the MPI. Compared with the AC group, the ID group reported similar levels of pain

intensity on the MPQ. Compared with the DYS group, the ID group showed similar levels of depression on the HADS, and interference and life control on the MPI.

Overall programme effectiveness

For each outcome variable, the means and standard deviations for the 3 MPI groups pre- and post-treatment, and at follow up, along with ANOVA results are presented in Table 1.

Insert Table 1 and Figure 1 about here

Significant Time effects (in the absence of significant Group X Time interactions) indicate that similar changes occurred for all three groups from pre- through post-treatment to follow-up, and so provide information on the overall effectiveness of the programme.

Significant Time effects (in the absence of significant Group X Time interactions) occurred for the HADS Depression, and MPI Self/Life Control scales. Depression scores decreased significantly from pre-treatment to post-treatment, but increased at follow-up. However, follow-up scores were significantly lower than pre-treatment scores. Scores on the MPI Self/Life Control scale increased from pre- to post-treatment, and decreased at follow-up. Follow-up scores were significantly higher than pre-treatment scores. Thus, chronic pain patients in all three group showed significant improvement in depression and the sense of control they had over their lives after participating in the programme, and this improvement was partially maintained at follow-up.

Differential Treatment Response

There were significant Group X Time interactions on the MPQ Present Pain Intensity scale and the MPI Interference and Solicitous Responses scales. These interactions indicate

that on these three variables, the AC, ID and DYS groups showed different responses to treatment. Graphs of these interactions are presented in panels A, B and C of Figure 1.

From Panel A of Figure 1 it may be seen that for the MPQ Present Pain Intensity Scale, the DYS group improved significantly from pre- to post-treatment, but this improvement was not maintained at follow-up ($F = 227.86$; $df = 2, 122$; $p < .01$). In contrast, the AC and ID groups did not improve over treatment, or at follow-up. At both pre-treatment ($F = 13.09$, $df = 2, 122$; $p < .01$), and follow-up ($F = 12.05$; $df = 2, 122$; $p < .01$) the means of the DYS group were significantly higher than those of the AC and ID groups.

From Panel B of Figure 1 it may be seen that for the MPI Interference scale both the DYS and AC groups improved significantly over time (albeit with different change patterns), but the ID group showed no significant change. The DYS group improved significantly from pre- to post-treatment, and maintained this improvement at follow-up ($F = 8.67$; $df = 2, 150$; $p < .01$). The AC group did not improve from pre- to post-treatment, but showed significant improvement from post-treatment to follow-up ($F = 7.85$; $df = 2, 150$; $p < .01$). At pre-treatment ($F=14.64$; $df=2, 150$; $p<.01$) and follow-up ($F=22.71$; $df=2,150;p<.01$) the means of the AC group were significantly lower than those of the other two groups.

From Panel C of Figure 1 it may be seen that for the MPI Solicitous Response scale, only the DYS group showed significant change over time, with a drop in solicitous response scores from pre- to post-treatment and an increase at follow-up ($F = 15.26$; $df = 2, 138$; $p < .01$). At pre-treatment ($F = 48.54$; $df = 2, 138$; $p < .01$), post-treatment ($F = 13.53$; $df = 2, 138$; $p < .01$), and follow-up ($F = 28.66$; $df = 2, 138$; $p < .01$), means of the ID group were significantly lower than those of the other two groups.

The Groups X Time interactions from ANCOVAs with pain duration as the covariate were similar to those from the ANOVAs in magnitude and statistical significance. For the

MPQ Present Pain Intensity scale, the ANOVA and ANCOVA F values were 2.78 and 3.28 respectively, and both were significant at $p < .05$. For the MPI Interference scale, the ANOVA and ANCOVA F values were 3.44 and 3.59 respectively, and these were significant at $p < .05$ and $p < .01$ respectively. For the MPI Solicitous Responses scale, the ANOVA and ANCOVA F values were 3.69 and 4.10 respectively, and both were significant at $p < .01$. Thus, pretreatment group differences in pain duration, did not account for the differential response to treatment of the three groups as assessed by the MPQ Present Pain Intensity scale and MPI Interference and Solicitous Responses scales.

Patient Satisfaction

Participants rated each component of the pain programme on a scale from 0 to 10 with regard to how helpful or unhelpful they found each component. All programme components received an average rating of 7 or higher, indicating a high level of satisfaction with the various components of the programme. A thematic content analysis of comments about the psychological components of the programme (group discussion, life skills/CBT and relaxation therapy) was conducted, and for each component, a theme of overall evaluation, and a theme of principal benefits were identified. For all three psychological components most evaluative statements were positive (e.g., “excellent”, “very helpful”, and “very worthwhile”). The predominant benefit of the group discussion was the sharing of experiences with others in similar situations (e.g. “Its good to hear other people. It makes you feel you are not on your own”, “great to talk to others who understand what you are going through”, and, “It was brilliant to share with the group, it gave me great support”). The predominant benefit of the life skills / CBT component was gaining factual information and positive cognitive changes (e.g. “I learned about life skills”, “it explained a lot of my symptoms”, “I got good understanding”, “ it changed my outlook of myself” and

“it changed my way of thinking”). The predominant benefit of relaxation training was improved self-regulation (e.g. “gave me better well-being”, “Increased my awareness”, and “has given me a goal”).

DISCUSSION

One aim of this study was to evaluate the overall effectiveness of the Pain Management Programme at St. Vincent’s University Hospital in Dublin. The study showed that all patients who participated in the programme showed significant improvement in depression and the sense of control they had over their lives; this improvement was partially maintained at follow-up; and participants expressed a high level of satisfaction with all aspects of the programme. Of course, without a control group, it is not clear whether these improvements were greater than those which would have occurred without treatment. Nevertheless, these results are consistent with the findings of reviews of numerous studies of the efficacy of multidisciplinary treatment programmes for chronic pain (Becker et al., 2000; Fishbain et al.1993; Mayer et al., 1999; Sanders & Brena, 1993; White & Harth, 1996).

The study was also designed to test three specific hypotheses. The first hypothesis, concerning the proportions of cases in each of the 3 groups was supported, insofar as the proportions of patients classified into the three MPI groups in the present study were similar to those found in previous studies, with 20-30% of cases in the AC and ID groups and 40-50% in the DYS group (Collins et al., 1998; Turk & Rudy 1988).

The second hypothesis - that the DYS and ID groups would report greater pre-treatment pain severity and psychological distress than the AC group - was partly supported. Compared with the AC group, the DYS group reported significantly higher levels of pain on all 3 MPQ scales, and significantly more psychological distress on both of

the HADS scales. However, the only pain or distress variable on which the ID group differed significantly from the AC group was the HADS Depression scale.

The third hypothesis - that the DYS group would show greater improvement on measures of pain, psychological distress, interference and life-control compared with the AC group – received limited support. On the MPQ Pain Intensity scale, the DYS group improved significantly from pre- to post-treatment, while the AC group did not. However, at follow-up, the DYS group had relapsed, and there was no significant difference between pre-treatment and follow-up means on the MPQ Present Pain Intensity Scale for the DYS group. On the MPQ Interference scale both the DYS and AC groups improved significantly from pre-treatment to follow-up, although, the DYS group showed greater improvement from pre- to post-treatment, compared with the AC group. Both the DYS and AC groups showed similar and significant improvement on the HADS Depression scale and the MPI Self/Life Control scale; and no significant improvement on 2 MPQ pain scales (Total Pain Rating Index and the Number of Words Chosen to describe their pain) and the HADS Anxiety scale.

Confidence may be placed in the validity of the findings relevant to the first two hypotheses because there were no major design flaws in the aspect of study which addressed these hypotheses. However, the study had a number of limitations which have a bearing on the confidence that may be placed in results relevant to the third hypothesis, concerning the differential response to treatment of the three groups. There was the possibility that pre-treatment intergroup differences on key variables, particularly pain duration, could have accounted for the differential treatment responses of the three groups. However, ANCOVAs with this variable as the covariate showed pretreatment group differences in pain duration did not account for the three groups' differential

treatment responses on the by MPQ Present Pain Intensity scale and MPI Interference and Solicitous Responses scales.

There were also two important sources of variability contributing to treatment outcome which were not controlled for in this study that deserve mention. First, while the programme did follow a broad clinical protocol, it was not manualized, so participants may have received slightly different versions of the intervention, and this in turn may have influenced outcome with cases who received a higher quality or quantity of treatment showing a better treatment response. Second, there was considerable variability in the follow-up period, which ranged from 6 - 23 months, and this may have influenced differential outcome of the three groups at follow-up.

The limited degree to which the present study to found different responses to treatment across the three groups is not consistent with the results of some previous studies, in which pain patients classified as DYS have shown more pronounced responses to pain management programmes than those classified as AC or ID (Rudy et al., 1995; Turk et al., 1998). For example, in a study of patients with temporomandibular pain, Rudy et al. (1995) found that, compared with ID and AC groups, the DYS group showed significantly greater improvements in pain intensity, interference and depression. Turk et al. (1998) found similar results in patients with fibromyalgia in an outpatient treatment program. An important question is whether the limited degree to which the current study provided support for the third hypotheses (that the DYS group would show greater improvement on measures of pain, psychological distress, interference and life-control compared with the AC group) was due to the design flaws (baseline differences in pain duration, lack of manualization, and variability in follow-up periods). On balance, taking account of the overall pattern of results, the most likely explanation for the lack of sustained improvement in the DYS group on multiple measures of pain and distress

(compared with the AC group) is that the programme did not adequately address the psychological needs of the DYS group. The programme may have been too brief to empower participants to continue with the gains they made during treatment in areas such as reducing MPQ Pain Intensity and MPI Solicitous Responses. Also its components may not have addressed the specific issues which underpinned the high level of distress experienced by the DYS group, and so the programme did not differentially affect their scores on other measures of pain and psychological distress (specifically, the MPQ Number of Words Chosen or Total Pain Rating Index scales, the MPI Self/Life Control scale, and the HADS Anxiety scale).

The next important step in the development of the Pain Management Programme at St. Vincent's University Hospital, is manualization and expansion of the psychological component of the programme to better address the needs of patients classified as dysfunctional on the MPI. With these developments in place, it would be useful to replicate the current study, but with a standard follow-up period of 6 months, rather than a highly variable follow-up period as occurred in the present study. In the long term, the psychological profiling of chronic pain patients may facilitate the tailoring of pain management programmes to meet patients' specific psychological treatment needs. Future research should evaluate whether tailoring psychological treatments to patient psychological profiles improves treatment outcome.

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Table 1. Status of the Adaptive Copers, Interpersonally Distressed and Dysfunctional groups on clinical scales of the Multidimensional Pain Inventory, the McGill Pain Questionnaire and the Hospital Anxiety and Depression Scale before and after treatment and at follow-up.

		Adaptive Copers (N=19)			Interpersonally Distressed (N=18)			Dysfunctional (N=42)			3x3 ANOVA		
		Time 1	Time 2	Time 3	Time 1	Time 2	Time 3	Time 1	Time 2	Time 3	GXT	G	T
MPI													
Interference	M	4.12	4.23	3.46	4.85	4.46	4.46	5.07	4.52	4.64	3.44*	7.74**	10.30***
	SD	0.74	0.85	1.39	0.80	0.78	0.78	0.59	0.87	1.08			
Self/life Control	M	4.26	4.60	4.71	3.08	3.47	3.19	2.84	3.71	2.91	1.63	21.40***	5.29**
	SD	0.81	0.43	0.92	1.05	1.01	1.00	1.15	0.99	1.58			
Support	M	5.21	4.98	4.79	3.00	3.52	3.81	5.22	4.94	4.73	2.10	17.07***	0.02
	SD	0.63	0.64	0.76	0.99	0.89	3.77	0.83	0.89	1.01			
Punishing Responses	M	1.35	1.14	1.05	3.27	2.95	2.88	1.58	1.37	1.69	0.79	14.87***	1.48
	SD	1.19	1.22	0.89	1.43	1.40	1.44	1.32	1.26	1.37			
Sollicitous Responses	M	4.33	3.75	3.95	2.10	2.36	2.12	4.22	3.24	3.65	3.69**	15.96***	5.00**
	SD	1.29	1.33	1.14	1.02	0.93	1.46	1.21	1.24	1.21			
Distracting Responses	M	2.64	2.55	2.67	1.20	1.44	1.43	3.30	2.59	2.96	2.33	18.01***	1.02
	SD	1.08	0.80	0.98	0.76	1.12	1.34	1.19	1.30	1.14			
General Activity	M	2.60	2.78	2.83	2.47	2.61	2.65	2.05	2.27	2.21	0.11	4.38*	2.82
	SD	0.74	0.77	0.98	0.72	0.77	0.88	0.75	0.92	0.95			
MPQ													
No. of Words Chosen	M	9.21	11.21	9.74	12.67	12.06	10.61	13.67	14.48	14.86	1.30	7.66**	0.85
	SD	4.49	4.20	5.65	5.72	5.89	5.16	5.91	5.30	4.99			
Pain Rating Index Total	M	22.47	24.97	22.68	33.88	32.41	27.88	34.31	36.88	39.19	1.44	8.54***	0.31
	SD	12.14	9.49	15.08	17.12	17.00	16.79	15.52	16.19	14.70			
Present Pain Intensity	M	2.35	2.53	2.06	2.07	2.40	2.33	3.41	2.72	3.25	2.78*	10.43***	0.08
	SD	1.22	1.23	0.90	0.59	0.98	0.72	1.04	1.11	1.19			
HADS													
Anxiety	M	7.05	7.10	6.21	10.33	11.00	10.05	12.85	11.32	11.65	1.27	13.76***	1.42
	SD	4.33	3.35	4.66	4.24	3.43	3.08	4.43	4.47	4.23			
Depression	M	7.10	6.58	6.21	10.11	8.22	8.61	10.95	9.51	10.18	0.59	7.92**	5.72**
	SD	3.75	2.57	4.62	3.55	2.84	3.94	3.07	4.00	4.39			

Note. MPI= Multidimensional Pain Inventory. MPQ = McGill Pain Questionnaire. HADS=Hospital Anxiety and Depression Scale. T1 = pre-treatment. T2 = post treatment. T3 = follow-up. G = F values for group effect. T = F values for Time effect. G X T = F values for Group X Time Interaction. F values are from 3 X 3 mixed model ANOVA's. *P<.05, **P<.01, ***P<.001.

Figure 1. Mean scores of Adaptive Copers, Interpersonally Distressed and Dysfunctional groups pre-treatment (Time 1), post-treatment (Times 2) and at follow-up (Time 3) on variables where significant Groups X Time interactions occurred: the McGill Pain Questionnaire Present Pain Intensity Scale, and the Multidimensional Pain Inventory Interference and Solicitous Responses Scales.

