Cognitive-Behavioral Pain Management for Elderly Nursing Home Residents

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A cognitive-behavioral pain management program for elderly nursing home residents with chronic pain was compared with an attention/support control treatment in a randomized pre-/post-comparison group design with follow-up. Thirteen women and nine men, ranging in age from 61 to 98 (M = 77.2), from two large nursing homes participated in the treatment programs through 10 weekly group sessions. Results revealed that the subjects who received the cognitive-behavioral training reported less pain and pain-related disability, although the two programs were perceived as equally credible both before and after treatment. No significant treatment effects were found for depression and physician medication ratings. Treatment effects were maintained at 4-month follow-up, despite an overall increase in reported pain. Findings indicate that elderly nursing home residents with chronic pain and without serious cognitive impairment can benefit substantially from training in cognitive and behavioral pain management strategies that are known to be effective with younger age groups and the community-resident elderly population.

Research has demonstrated that pain is a major problem among the elderly in long-term care facilities (Ferrell, Ferrell, & Osterweil, 1990). In fact, nursing staff rate pain complaints as the second most frequent behavior problem among nursing home residents, surpassed only by depressed mood (Haley, 1983). There are many barriers to effective management of pain in these settings (Herr & Mobily, 1996). Experimental evaluations of psychological interventions for pain management in nursing homes are scarce, and there are no published investigations of cognitive-behavioral interventions for pain management with elderly nursing home residents.

Pain and Depression

Within long-term care settings, the prevalence of depression is high (Parmalee, Katz, & Lawton, 1992) and the relationship between pain and depression has received considerable attention from researchers. Relationships between pain, depression, and physical health have been well established in the general pain literature (e.g., Roy, Thomas, & Matas, 1984) and have been upheld in a few studies of elderly outpatients (e.g., Williamson & Schulz, 1992). Data support a reciprocal relationship, both that depression promotes pain and pain promotes depression, although the magnitude of the relationships is generally weak. Several studies have found a strong association between pain and depression among elderly institution residents, not attributable solely to functional disability, health status or cognitive impairment (Cohen-Mansfield & Marx, 1993; Parmalee, Katz, & Lawton, 1991).

Psychological Management of Chronic Pain

Psychological interventions for pain management have become standard and integral parts of multidisciplinary programs for chronic pain (Gatchel & Turk, 1996). The application of these modalities to pain management in the elderly is a relatively new and growing area of research. Only one published study has provided an age analysis of outcome data. Puder (1988) reported that age was unrelated to outcome for a cognitive-behavioral group treatment that was successful for reducing pain interference and improving coping. She concluded that "there is every reason to include older adults in these programs because they can and do benefit from treatment" (p. 207). In fact, a growing body of literature supports the effectiveness of cognitive-
behavioral pain management programs for community-dwelling older adults (e.g., Fry & Wong, 1991; Keefe et al., 1990; O’Leary, Shoor, Lorig, & Holman, 1988).

**Pain Management in Long-Term Care**

Pain assessment and management are understudied in nursing homes. Ferrell et al. (1990) reported that pain management strategies were very limited in their sample of elderly nursing home residents, consisting primarily of analogies, physical therapy, and heating pads. Haley (1983) found that although “pain complaints” was rated as the second most frequent behavior problem by nursing home staff, it rated much lower in terms of the staff’s interest in learning strategies to reduce the behavior. He suggested that staff may either see behavioral techniques as irrelevant for this problem or may be accustomed to “living with” it.

Two small, exploratory studies have suggested that pain and associated behaviors in elderly nursing home residents can be positively influenced by operant conditioning and positive social interaction. Miller and LeLievre (1982) used attention and verbal reinforcement (ABAB design) to increase exercising in a sample of 4 elderly residents with chronic pain. Data from these four case studies revealed that this simple behavioral procedure reduced intake of prn pain medication, pain behaviors, and subjective pain reports. Adams and McGuire (1986) reported that elderly residents of a long-term care facility who watched humorous movies over a period of 6 weeks generally reported less pain at the end of the treatment, decreased their use of prn pain medications, and had significantly higher affect scores than individuals viewing nonhumorous movies. Unfortunately, this study suffered from several significant design weaknesses.

The purpose of the present study was to provide a controlled experimental evaluation of the effectiveness of a cognitive-behavioral (CB) pain management program for elderly nursing home residents. The CB program was compared with an attention/support (AS) condition involving minimally structured, supportive group therapy. Although attention-only treatment has been found to be ineffective for pain management in rheumatoid arthritis patients in the community (O’Leary et al., 1988), its impact in the nursing home setting had not been evaluated. The lack of adequate social interaction and support that is common in long-term care settings suggested that this form of control condition would be very relevant in this setting. Evaluation of treatment outcome was multidimensional, incorporating measures of pain, pain-related physical disability, depression and medication use. It was hypothesized that following treatment residents in the CB treatment group would (a) report less severe pain and less pain distress, (b) report less pain-related physical disability, (c) be less depressed, and (d) take fewer pain medications, than residents in the AS control group.

**Method**

**Subjects**

The subjects for this study were 28 elderly residents of two nursing homes in the city of Winnipeg, Manitoba, Canada. The first (Site A) is a 311-bed personal care home in which approximately 80% of the residents at the time of the study were age 60 or older. Of the 60 residents referred for potential participation, 12 became part of the initial project sample and 11 completed one of the treatment programs. The second (Site B) is a 198-bed long-term care center within a large geriatric health facility for war veterans. Residents were also recruited from an interim-care component (55 beds) housing individuals awaiting placement in a long-term care facility. At the time of the study, 99% of the residents in these two components were age 60 or older. Of the 44 residents referred, 16 became part of the initial sample and 11 completed one of the treatment programs.

**Recruitment.** — Criteria for referral of potential participants were (a) age 60 or older, (b) English speaking, (c) experiencing persistent or chronic pain of any type for a minimum of 3 months, and (d) cognitive functioning intact or mild impairment. All referred individuals were screened for willingness to participate and eligibility through interviews, including a brief mental status evaluation with the Short Portable Mental Status Questionnaire (SPMSQ) (Pfeiffer, 1975). This instrument has been shown to have good test-retest reliability ($r = .82$ to .83), concurrent validity with several neuropsychological measures ($r = .57$ to .66 ), and clinical validity. Only residents scoring in the intact or mild-impairment ranges were eligible for inclusion in this study.

Presence of chronic pain was based on the International Association for the Study of Pain (IASP) definition: Pain that has endured for 3 months or more and is refractory to treatment. Primary medical diagnoses for pain for the initial subjects were osteoarthritis (36%), rheumatoid arthritis (11%), old fractures (11%), unspecified arthritis (7%), neuropathies (7%), CVA residuals (7%), spinal cord injuries/tumors (7%), and other conditions (14%). For residents who consented to participate, written consent was also obtained from their physicians indicating the absence of medical contraindications to their participation.

Of the 104 referrals received, 48 (46%) were deemed ineligible for reasons such as cognitive impairment, absence of reported pain, and speech/hearing problems, and 28 (27%) refused participation, comparable to rates reported by Parmalee et al. (1991, 1992) in their nontreatment study of pain and depression in a nursing home complex. Of the 28 eligible and consenting residents in the present study, 14 of whom were assigned to each treatment condition, 1 moved prior to the initiation of the treatment program (AS condition), 3 dropped out (1 CB, 2 AS), 2 died prior to completing the program (1 CB, 1 AS), and 1 was excluded from the final analyses (1 CB) because he was deemed to not be part of the intended sampling population, leaving a final sample of 21 residents (11 CB, 10 AS). Of the 3 subjects who dropped out, one (AS group) left the study prior to the first treatment session and the other two (1 CB, 1 AS) left after the first treatment session. No statistically significant differences were found between the final sample and the group of lost subjects on any of the demographic or dependent variables. The final sample consisted of 8 men and 13 women, ranging in age from 61 to 98 years ($M =$
form version of the McGill Pain Questionnaire (SF-MPQ) following measures were administered pre- and post-treat-
ment and at the 4-month follow-up assessment:

Short-form McGill Pain Questionnaire. — The short-
form version of the McGill Pain Questionnaire (SF-MPQ) (Melzack, 1987) provides scores for sensory, affective, and
total ratings of pain. It also contains the present pain inten-
sity (PPI) index from the MPQ and a visual analogue scale	(VAS) for measures of overall pain intensity. Correlations
between the three scales (sensory, affective, and total) on
the SF-MPQ and the corresponding MPQ indices have been
found to be moderate to high (r = .65 to .94), and the
SF-MPQ has been found to be sensitive to traditional clin-
ical pain therapies (Melzack, 1987). For this study, the
visual analogue scale was replaced with a numerical rating
scale (NRS).

Roland and Morris Disability Questionnaire (RMDQ). — The RMDQ (Roland & Morris, 1983) is a 24-item version
of the Sickness Impact Profile (SIP) initially designed for
use with back-pain patients. The shortened scale has been
found to have good test-retest reliability (r = .76 to .91),
good test-retest agreement on individual items (r = .83),
marginal construct validity, and sensitivity to treatment that
is at least as good as the SIP and its subscales (Deyo, 1986;
Roland & Morris, 1983). The RMDQ is a reliable and valid
measure of physical dysfunction in chronic pain patients
with pain in sites other than the low back (Jensen, Strom,
Turner, & Romano, 1992; Waddell & Turk, 1992). Final
scores were based on a subset of 16 items that were found
to be applicable to all subjects (Pearson correlations .90 to
.94 with full-scale scores).

Geriatric Depression Scale. — The Geriatric Depression
Scale (GDS; Yesavage et al., 1983) is a 30-item self-report
instrument for screening depression in older adults. The
scale has been found to have good internal consistency (α = .94), split-half reliability (r = .94), test-retest reliability (r = .85 at one week), concurrent validity (r = .80 with other depression self-rating scales), and clinical validity (Yesavage et al., 1983). Two studies have demonstrated good psychometric properties for the GDS with samples of elderly nursing home residents (Lesher, 1986; Parmalee, Lawton & Katz, 1989).

Pain medication use. — A measure of pain medication
intake that avoids common problems with calculating medica-
tion equivalencies when comparing different medication
combinations within and between patients, and has been
found to be sensitive to treatment effects, was used (Mc-
Cauley & Frank, 1983). Three physicians blindly rated
medication combinations at pre- and post-treatment and
follow-up, with regard to their concerns about abuse poten-
tial, possible side effects, over-medication, and other issues.
Ratings range from 0 = no pain medication taken, to 5 =
very concerned about intake.

Participant-feedback questionnaire. — A participant-
feedback questionnaire was designed to solicit information
at post-treatment and follow-up regarding perceptions of
the treatments and value of the coping skills learned.
A caregiver pain-rating form was developed and used to
obtain ratings of pain behaviors from nurse caregivers as a
means of socially validating any self-reported changes in
pain. However, the caregiver ratings were found to have low
sensitivity and reliability with a highly positively skewed
distribution, and thus were excluded from further analyses.

Procedure
Pre-treatment, post-treatment, and follow-up assessments
consisted of structured interviews, medical chart reviews, and
caregiver ratings. Because self-ratings of pain are known to
vary across time for chronic pain patients, and memory for
pain is known to be susceptible to bias, multiple evaluation
doctor ratings were used. The SF-MPQ was administered to each
participant a minimum of three times within a 1-week period
and the results were averaged for the data analyses.

After the screening interviews and pre-treatment assess-
ments, subjects were assigned to treatment groups using a
stratified block randomization based on gender, age, pain di-
agnosis, duration of chronic pain, and other treatments (i.e.,
medications, physiotherapy). The therapists were two doc-
tor candidates in clinical psychology, with experience in
cognitive-behavioral, supportive, and group psychotherapy. The treatment groups were counterbal-
ced by therapist across the two treatment settings. Pre-
treatment assessments were completed prior to treatment
group assignments. Thirty-five percent of post-treatment
and follow-up assessments were conducted by clinicians not
involved in the treatment programs (and blind to treatment
conditions) to minimize demand characteristics.

Cognitive-behavioral (CB) treatment. — The CB treat-
ment was modeled after the program outlined by Turk,
Meichenbaum, and Genest (1983), with information and ac-
tivities tailored to the setting where appropriate. Subjects in
this treatment met for 10 weekly group sessions of approxi-
mately 60 to 75 minutes’ duration. A treatment manual was
developed incorporating: (a) education and reconceptual-
ization of pain (2 sessions); (b) training in behavioral and
cognitive coping skills, including progressive relaxation,
imagery, attention diversion, and cognitive restructuring
(5 sessions); and (c) consolidation of skills and follow-
through using planning, practice, and role-playing (3 ses-
sions). The general format of each session was (a) review of
previously discussed material and homework assignments,
(b) presentation and practice of new information and skills,
(c) discussion of the application of the new skills using a
problem-solving framework, and (d) review of the session
and assignments for home practice.
Attention/support (AS) treatment. — Subjects assigned to the AS treatment condition also met for 10 weekly group sessions of approximately 60 to 75 minutes' duration. These sessions were semi-structured and involved discussions by group members about pain experiences, coping, and other topics of interest. The therapists provided empathy and support, and moderated group discussion.

Treatment credibility. — After the first group session when the treatment program was outlined, participants in both treatments completed a treatment credibility rating form, adapted from Borkovec and Nau (1972) and previously used in a group comparison study of CB pain management (Kerns, Turk, Holzman, & Rudy, 1986). These ratings served as an indicator of comparability of the treatments in terms of perceived credibility and expectation for improvement. This rating form was re-administered at the post-treatment assessment.

Treatment integrity. — Treatment integrity was evaluated through a procedure used in group comparison studies of psychological pain management programs (Keefe et al., 1990; Kerns et al., 1986). All of the group treatment sessions were audiotaped, and two independent raters (doctoral therapists experienced in both CB and supportive psychotherapy) were given randomly selected 5-minute segments. Without knowledge of the treatment conditions, they were asked to listen to the therapists' statements and indicate which treatment (CB or AS) was being administered. The percentage of correctly identified segments served as an indicator of treatment integrity.

Treatment compliance. — Checklists of treatment components were used to monitor treatment compliance for the CB treatment. A checklist was completed by the therapists after each treatment session to document the information presented and skills taught during the sessions. At the beginning of each session, the therapists also completed checklists to document homework activities carried out by participants between sessions. Where possible, participants who did not complete a portion of the training were given extra instruction and/or assistance as needed in order to complete the omitted components. Participants who missed group sessions in the treatment program were given individual make-up sessions.

RESULTS
Prior to analysis, procedures for screening of grouped data were employed (Tabachnick & Fidell, 1989). Logarithmic transformation was applied to the pain duration variable. One subject (CB group) whose scores produced multivariate outliers was dropped from the analyses. Due to a near multicollinearity between NRS and PPI pain ratings from the SF-MPQ, only the NRS ratings were used in the multivariate analysis. Multivariate analyses were performed using the general linear model with unweighted cell means presented and skills taught during the sessions. At the beginning of each session, the therapists also completed checklists to document homework activities carried out by participants between sessions. Where possible, participants who did not complete a portion of the training were given extra instruction and/or assistance as needed in order to complete the omitted components. Participants who missed group sessions in the treatment program were given individual make-up sessions.

Physician Medication Ratings
Mean medication ratings by the three physicians were 1.60 (SD = .99), 1.57 (SD = .90), and 1.58 (SD = .97), comparable to those reported by McCauley and Frank (1983).

Attendance, Treatment Credibility, Treatment Integrity, and Treatment Compliance
Attendance in the CB and AS groups ranged from 60 to 100% of sessions, with an average of 82%. A $2 \times 2$ (Group $\times$ Site) analysis of variance (ANOVA) for attendance revealed no significant main effect for group [$F(1,17) = .99, p = .33$], but the main effect for site was significant [$F(1,17) = 4.27, p = .05$]. Average attendance at Site A was 89% (SD = 4.5) as compared to 75% (SD = 4.7) at Site B. The Group $\times$ Site interaction was not significant [$F(1,17) = .01, p = .94$]. The majority of absences were due to illness.

Compliance for the CB treatment was found to be high for the therapists and moderate for the subjects. Session compliance levels for the two therapists were 92.3% (SD = 5.5) and 83.8% (SD = 14.2), and the difference was not statistically significant ($t = 1.77, p > .05$). Items not covered in a session were carried forward to the subsequent session. Weekly homework checklists for subjects in the CB treatment indicated an average of 57.7% (SD = 31.4) of subjects attempted the homework assignments each week. The range in homework compliance across sessions was great (0 to 100%) and was used as a basis for adapting the program material in future sessions.

Pre-Treatment Group and Site Comparability
Table 1 provides comparison data by site for subjects from the two nursing homes. Table 2 provides data on the same variables by treatment group for subjects in the CB and AS treatment conditions. There were no significant dif-
PAIN MANAGEMENT FOR NURSING HOME ELDERLY

Table 1. Descriptive Data by Site

<table>
<thead>
<tr>
<th>Variable</th>
<th>Site A</th>
<th>Site B</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Treatment Group – CB/A</td>
<td>6/5</td>
<td>5/5</td>
</tr>
<tr>
<td>Age</td>
<td>61-87</td>
<td>71-98</td>
</tr>
<tr>
<td>M (SD)</td>
<td>76.5 (7.8)</td>
<td>78.8 (8.6)</td>
</tr>
<tr>
<td>Sex (male/female)</td>
<td>0/11</td>
<td>8/25</td>
</tr>
<tr>
<td>Education</td>
<td>9.9 (2.6)</td>
<td>10.0 (3.3)</td>
</tr>
<tr>
<td>Years at current nursing home°</td>
<td>6.4 (4.0)</td>
<td>3.3 (2.8)</td>
</tr>
<tr>
<td>Cognitive functioning: SPMSQ score</td>
<td>1.5 (1.6)</td>
<td>1.9 (1.2)</td>
</tr>
<tr>
<td>Duration of pain (Yrs)b</td>
<td>25.6 (25.7)</td>
<td>24.9 (24.3)</td>
</tr>
<tr>
<td>Number of pain locations</td>
<td>4.5 (2.0)</td>
<td>7.1 (4.9)</td>
</tr>
</tbody>
</table>

Note. Differences (2-tailed t and χ²) non-significant unless otherwise indicated.

Table 2. Descriptive Data by Treatment Group

<table>
<thead>
<tr>
<th>Variable</th>
<th>Group Cognitive-Behavioral (CB)</th>
<th>Group Attention/Support (AS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Location – Site A/B</td>
<td>6/5</td>
<td>5/5</td>
</tr>
<tr>
<td>Age</td>
<td>68-98</td>
<td>61-90</td>
</tr>
<tr>
<td>M (SD)</td>
<td>78.1 (8.5)</td>
<td>77.0 (8.1)</td>
</tr>
<tr>
<td>Sex (male/female)</td>
<td>4/7</td>
<td>4/6</td>
</tr>
<tr>
<td>Years at current nursing home°</td>
<td>9.6 (3.6)</td>
<td>10.3 (2.0)</td>
</tr>
<tr>
<td>Education</td>
<td>32.4 (28.6)</td>
<td>17.5 (16.9)</td>
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<tr>
<td>Cognitive functioning: SPMSQ score</td>
<td>1.4 (1.4)</td>
<td>2.1 (1.4)</td>
</tr>
<tr>
<td>Duration of pain (Yrs)b</td>
<td>6.6 (4.5)</td>
<td>4.7 (2.4)</td>
</tr>
<tr>
<td>Number of pain locations</td>
<td>7.0 (2.2)</td>
<td>6.9 (2.3)</td>
</tr>
</tbody>
</table>

Note. No significant differences (2-tailed t and χ²) between groups. Log transformed for statistical analyses.

Table 3. Pre-Treatment, Post-Treatment, and 4-Month Follow-up Means and Standard Deviations for Dependent Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Treatment Group Cognitive-Behavioral (CB)</th>
<th>Treatment Group Attention/Support (AS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Pain</td>
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<tr>
<td>Pain Rating Index (PRI)</td>
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<tr>
<td>Pre</td>
<td>18.0 (6.1)</td>
<td>18.5 (7.6)</td>
</tr>
<tr>
<td>Post</td>
<td>10.6 (7.5)</td>
<td>21.6 (8.3)</td>
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<tr>
<td>Follow-up</td>
<td>13.3 (6.6)</td>
<td>21.4 (10.3)</td>
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<tr>
<td>Numerical Rating Scale (NRS)</td>
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<tr>
<td>Pre</td>
<td>6.1 (1.8)</td>
<td>5.0 (2.5)</td>
</tr>
<tr>
<td>Post</td>
<td>2.9 (1.5)</td>
<td>4.8 (2.1)</td>
</tr>
<tr>
<td>Follow-up</td>
<td>4.9 (2.0)</td>
<td>5.9 (2.5)</td>
</tr>
<tr>
<td>Pain-related disability</td>
<td></td>
<td></td>
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<tr>
<td>RMDQ subset</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>7.7 (4.1)</td>
<td>8.0 (2.5)</td>
</tr>
<tr>
<td>Post</td>
<td>5.1 (3.5)</td>
<td>7.1 (3.6)</td>
</tr>
<tr>
<td>Follow-up</td>
<td>5.8 (2.9)</td>
<td>8.9 (3.6)</td>
</tr>
<tr>
<td>Depression</td>
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<td></td>
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<td>Geriatric Depression Scale (GDS)</td>
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</tr>
<tr>
<td>Pre</td>
<td>8.7 (3.9)</td>
<td>12.2 (5.1)</td>
</tr>
<tr>
<td>Post</td>
<td>8.1 (4.8)</td>
<td>11.6 (6.3)</td>
</tr>
<tr>
<td>Follow-up</td>
<td>8.3 (3.5)</td>
<td>11.0 (7.0)</td>
</tr>
<tr>
<td>Pain Medication</td>
<td></td>
<td></td>
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<tr>
<td>Physician ratings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre</td>
<td>1.5 (9)</td>
<td>1.3 (7)</td>
</tr>
<tr>
<td>Post</td>
<td>1.7 (9)</td>
<td>1.4 (1.0)</td>
</tr>
<tr>
<td>Follow-up</td>
<td>1.9 (1.1)</td>
<td>1.3 (7)</td>
</tr>
</tbody>
</table>

Note. No significant differences between groups on pre-treatment scores for all variables after adjustment by covariates (MANCOVA and ANCOVAs, p > .05).

Differences by site or group on any of these variables, with the exception of sex ratios by site.

Unadjusted pre-treatment scores on all dependent variables by site and group are presented in Table 1 and Table 3, respectively. Pre-treatment comparability on the dependent variables was assessed through 2 X 2 (Site X Group) univariate and multivariate analyses of variance and covariance. There were no significant differences (p > .05) by site, group or the Site X Group interaction for any of these dependent variables.

Although the group difference in pre-treatment depression scores was not greater than that which would be expected due to chance (α = .05), the mean score for the AS group fell within the range suggesting possible mild depression (11 to 16) while the mean CB score did not (see Table 3). Reported rates for classification errors with the GDS range from 7 to 36% false negatives and 5 to 26% false positives using the cutoff score of 11 (Lesher, 1986; Parmalee et al., 1989; Yesavage et al., 1983). The range of scores for the AS group was 6 to 17, with 70% scoring over 10 and 50% scoring 14 or more. The range for CB subjects was 2 to 16, with 27% scoring over 10 and 18% scoring 14 or more. The mean GDS scores were consistent with previously reported means for nursing home samples of 10.5 (Parmalee et al., 1989) and 13.5 (Lesher, 1986). Depression scores were found to account for less than 9% of the variance in attendance, pre-treatment credibility ratings, and pre- and post-treatment pain ratings and disability scores. None of these relationships was statistically significant.
Post-Treatment Group Differences

Unadjusted means and standard deviations for each of the dependent variables at post-treatment are presented in Table 3. Differences between groups for these measures were evaluated through a series of multivariate analysis of variance (MANCOVA) and analysis of covariance (ANCOVA), with covariates for each analysis including the respective pre-treatment scores and other variables chosen through the described selection process.

For self-reported pain, a MANCOVA on the PRI (total score) and NRS from the SF-MPQ adjusted for pre-treatment scores revealed significant main effects, using Wilk’s $\lambda$, for group $[F(2,13) = 10.69, p < .005]$ and site $[F(2,13) = 4.47, p < .05]$, but no significant difference for the interaction $[F(2,13) = 1.37, p > .05]$. Subjects in the CB treatment group reported less pain at post-treatment than subjects in the AS group after adjustment for pre-treatment ratings. The strength of the relationship between treatment group and self-reported pain was strong, with $\eta^2 = .62$. Thus, 62% of the variance in reported pain at post-treatment was accounted for by treatment group, after adjustment for pre-treatment ratings.

For pain-related disability, an ANCOVA on the RMDQ scores adjusted for pre-treatment scores, age, and log of pain duration revealed a significant main effect for group $[F(1,13) = 7.22, p < .05]$. There were no significant differences for site $[F(1,13) = 4.05, p > .05]$ or the Group X Site interaction $[F(1,13) = .03, p > .05]$. Subjects in the CB treatment group reported less pain-related disability at post-treatment than subjects in the AS group after adjustment for pre-treatment scores, age, and duration of pain. Thirty percent of the variance in pain-related disability at post-treatment was accounted for by treatment group, after adjustment for the covariates. Examination of the covariates indicated a significant relationship for log of pain duration $[F(1,13) = 5.51, p < .05]$. Individuals with higher log of pain duration (and thus longer duration of pain) had lower pain-related disability scores at post-treatment.

For depression, an ANCOVA on GDS scores at follow-up showed that the weak post-treatment relationship with site of residence was not maintained. After adjustment for pre-treatment scores, there were no significant effects. The ANCOVA on physician medication ratings at follow-up revealed similar results to the post-treatment analysis. After adjustment for pre-treatment scores, sex, and number of pain locations, there were no significant effects.

Post-Treatment to Follow-Up Differences

Repeated measures MANCOVAs and ANCOVAs were used to determine whether group or site differences in outcome occurred from the post-treatment to follow-up assessments. The between-subjects factors were treatment group and site, and the within-subjects factor was time of assessment. Covariates were the same as used in the post-treatment and follow-up analyses. Only the 17 subjects for whom follow-up data were available could be included in these analyses.

The MANCOVA for self-reported pain revealed a significant effect for time $[F(2,26) = 3.46, p < .05]$, but no significant Time X Group $[F(2,26) = .64, p > .05]$ or Time X Site $[F(2,26) = .71, p > .05]$ interactions. The strength of association between time and pain ratings was .21, indicating a weak relationship. Adjusted means indicated that PRI and NRS pain ratings were slightly higher at follow-up than at post-treatment across all subjects. Examination of covariates revealed significant adjustment for pre-treatment PRI $[F(2,26) = 3.76, p < .05]$ and NRS $[F(2,26) = 3.77, p < .05]$ scores. There were no other significant time effects, Time X Group interactions, or Time X Site interactions for any of the other dependent variables.

Clinical Significance

In the absence of appropriate normative data for evaluating changes in outcome measures from a chronic pain treatment program, an important consideration is the percentage of treated patients who achieve clinically significant changes (Subramanian, 1994). At post-treatment, 80% of the CB subjects improved on the pain rating index (PRI) from the SF-MPQ, 10% remained the same, and 10% worsened. The average change in PRI scores was a 34% decrease for CB subjects. For the AS group, 30% improved and 70% worsened, with an average increase of 26% in PRI scores. For
the subjects remaining at follow-up, 86% of the CB subjects who had improved at post-treatment maintained these improvements (i.e., continued to show improvement from pre-treatment), whereas only 33% of the AS subjects who had improved maintained their gains. The pattern was very similar for the NRS and PPI from the SF-MPQ. These data indicate a pattern of clinically significant improvement in pain ratings for the CB subjects, in contrast to worsening of pain ratings for the majority of AS subjects.

For pain-related disability, 70% of CB subjects showed improvement in pain disability scores from the RMDQ at post-treatment, 10% remained the same, and 20% worsened. The average change in disability scores was a 28% decrease for CB subjects. For the AS group, 50% improved, 30% remained the same, and 20% worsened, with an average change of 10% decrease. For the subjects remaining at follow-up, 80% of the CB subjects who had improved at post-treatment continued to show improvement at follow-up, and 100% of the AS subjects maintained their improvements. These data indicate a pattern of clinically significant improvement in pain-related disability scores for the CB subjects, notably greater than the frequency and magnitude of improvement for AS subjects.

Changes in depression scores were similar across the two groups. Neither of the treatment conditions produced clinically significant improvement in depression, with half of the participants worsening over the course of treatment. Physician ratings of pain medication use were generally not improved by either of the treatment conditions.

Qualitative Data

Review of responses provided by subjects in both treatment groups on the participant-feedback questionnaire revealed that there were considerable variations in perceptions of the programs and how the programs influenced individual pain-coping styles. Responses to the question “What information or skills from the program, if any, do you think that you will use for coping with pain?” varied considerably between treatment groups. For CB participants, responses included the following specific components: gate-control model for conceptualizing pain (one participant), relaxation/breathing exercises (four), and imagery/distraction/mental activities (five). One CB participant noted that he had learned something else that would help him cope with his pain: “I can listen to other people and realize they are worse than I am . . . I feel sorry for these people.”

For the same question, all but one of the AS participants said there were no skills or information from the program that they would use for coping with pain. One participant stated, “I don’t think so . . . but hearing about how the other ladies deal with their pain was helpful.”

At the 4-month follow-up assessment the remaining participants were asked, “What information or skills from the program, if any, have you been using to help you cope with your pain?” and “In general, what do you do to cope with your pain now?” The responses from CB participants tended to blend together for the two questions, suggesting that many of the participants no longer distinguished between anything they had gained from the program and their pre-existing coping strategies. Several of the CB participants referred to skills taught during the treatment program, such as relaxation/breathing exercises (three participants), and distraction/imagery techniques (two). Most of the other responses suggested “tried and true” coping strategies, such as “I rub my leg,” “I go outside where it’s cold,” “I try to keep my anger away,” “talk myself out of it,” “sweat it out . . . think of other things,” “listen to music,” and “take pills.”

The majority of responses from AS group participants at follow-up suggested either that there was nothing from the program that they were using for pain coping, or that they believed the program was helpful but could not specify why. AS participants reported the following specific benefits: “[It gave] me confidence to ask for Tylenol” and “It gives you perspective about other people’s pain.” Several AS participants reported that they felt helpless in trying to manage their pain or that their efforts at coping were futile: “If it’s there it hurts just the same no matter what,” “I don’t do a thing . . . sometimes I’d like more,” and “Nothing seems to help.”

Discussion

This study has demonstrated through a controlled experimental evaluation that CB pain management training is effective for reducing pain and pain-related disability in elderly nursing home residents with chronic pain. The improvements produced by the CB training are clinically significant in terms of both frequency and magnitude. Additionally, this form of training resulted in lower reported pain and pain-related disability than less structured, supportive group therapy, although the two programs were perceived by participants as equally credible both before and after treatment. This finding is noteworthy because it indicates that the benefits obtained from CB therapy for elderly individuals in this type of setting are not simply nonspecific outcomes of increased attention and support. Rather, it suggests that the significant proportion of elderly nursing home residents with minimal cognitive impairment can be taught to employ cognitive and behavioral strategies that are known to be helpful for younger chronic pain patients (e.g., Turner & Romano, 1984) and elderly patients living in the community (e.g., Keefe et al., 1990; Puder, 1988). The data demonstrate that the benefits of the CB training over supportive therapy are maintained for a period of at least 4 months, despite overall increases in reported pain.

The results of this study both uphold and extend the existing literature on psychologically based interventions for pain management. The literature has suggested that CB pain therapies are generally most effective for improving self-ratings of pain and less consistently effective for improving other relevant dimensions such as physical activity, medication use, and psychological disability (Keefe, Dusmore, & Burnett, 1992; Turner & Chapman, 1982). This study found improvement in self-ratings of pain and pain-related disability from the CB treatment, but no measured improvement in depression or medication use. Turner and Romano’s (1984) hypothesis was supported by the results: CB therapies may promote maintenance of treatment gains by giving patients a wider range of skills for dealing with stress and pain than other types of interventions.
Other studies of CB pain interventions with older adults have found significant improvement in psychological disability (e.g., Fry & Wong, 1991; Keefe et al., 1990; Kerns et al., 1986), although there is variation in how this dimension is operationally defined (e.g., anxiety, depression). The lack of improvement in depression in this study may be attributable to two potentially related issues:

1. There was no significant relationship between pain and depression among participants of this study. At least one previous study (i.e., Ferrell et al., 1990) has failed to find a significant relationship between these variables among elderly nursing home residents.

2. Although many of the subjects in this study were mildly depressed as assessed by a standardized geriatric depression measure, it is arguable that some of this measured depression reflects realistic appraisals, feelings of low life satisfaction, demoralization, or reactions to normative life events (Lesher, 1986).

The lack of significant change in physician ratings of pain medication use is consistent with other studies of CB pain treatments with elderly patients (e.g., Keefe et al., 1990). This finding was not surprising given that high standards of medical treatment and monitoring were maintained in the nursing homes where the participants lived. The medication ratings revealed very few instances where physicians with specialty training in pain management were more than "slightly concerned" regarding a pain medication combination prescribed for one of the participants.

Only a few investigations of CB pain management training in community-dwelling older adults have examined the impact of such training on pain-related behaviors, with inconsistent results (e.g., Keefe et al., 1990). These studies have used structured observation in a controlled environment to assess pain behaviors. A different approach (i.e., behavior checklists used by caregivers) was attempted in this study, but the low sensitivity and reliability of this measure prevented meaningful analysis of the data. Because caregivers are the primary decision makers regarding most forms of pain treatments received by elderly nursing home residents, further research is needed to develop efficient and reliable measures for use by caregivers (see Mohide, Byles & Chambers, 1983).

The findings of this study are particularly noteworthy given the heterogeneity and small size of the sample of participating nursing home residents. As an exploratory investigation, this study has demonstrated the effectiveness of CB pain management for elderly nursing home residents across variability in age, gender, type of nursing home, duration of residence, medical diagnoses, health status, location and duration of pain, other treatments, and coping styles. Only variability in age and pain duration were removed from the statistical comparisons for pain-related disability. Limitations of this study include the small sample size, lack of independent ratings of therapist compliance, and potential for bias in results due to demand characteristics in collection of outcome measures. Replication studies with larger samples and additional experimental controls would strengthen the generalizability of the findings.

The importance of looking beyond the averaged group differences is strongly reinforced by the clinical observations of the therapists in this study. Consequential differences were evident in the participants' interests in and commitments to the pain management program, their capacities for sustained attention, their willingness and abilities to practice and integrate new skills, and their various personality dimensions, such as locus of control and general coping style. Matching pain management interventions with elderly individuals' coping styles has been demonstrated to enhance treatment gains and satisfaction (Fry & Wong, 1991). Many elderly individuals with chronic pain have developed personally effective coping strategies (Cook & Thomas, 1994), and these should also be considered in tailoring treatment. Issues that should be examined in future research include methods of selecting program components to individualize treatment, relative efficacy of individual, group, and/or combined program formats, and whether this type of pain management training (or variations of it) is differentially effective for more homogenous subgroups of this population.

Although commonly available pain management modalities (i.e., medications, massage, physical activity/physiotherapy) can be effective for elderly nursing home residents, research suggests that pain continues to be a significant problem for many of these individuals. This is the result of failure to detect pain problems, underavailability, and/or underutilization of treatments, and the fact that existing treatments are not adequate for many residents. This study has demonstrated that CB pain management training can help these individuals to reduce their pain and associated disability. Although this type of program requires a considerable investment of time for organization and delivery, the efficiency is quite favorable when contrasted with the costs and problems associated with medical consultation, long-term medication use, and high demands on caregivers.

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