

## Acceptance and Commitment Therapy and the Treatment of Persons at Risk for Long-Term Disability Resulting From Stress and Pain Symptoms: A Preliminary Randomized Trial

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Approximately 14% of the working-age Swedish population are either on long-term sick leave or early retirement due to disability. Substantial increase of sick listing, reports of work disabilities and early retirement due to stress and musculoskeletal chronic pain suggest a need for methods of preventing loss of function resulting from these conditions. The present preliminary investigation examined the effects of a brief Acceptance and Commitment Therapy (ACT) intervention for the treatment of public health sector workers who showed chronic stress/pain and were at risk for high sick leave utilization. ACT was compared in an additive treatment design with medical treatment as usual (MTAU). A group of 19 participants were randomly distributed into 2 groups. Both conditions received MTAU. The ACT condition received four 1-hour weekly sessions of ACT in addition to MTAU. At post and 6-month follow-up, ACT participants showed fewer sick days and used fewer medical treatment resources than those in the MTAU condition. No significant differences were found in levels of pain, stress, or quality of life. Improvements in sick leave and medical utilization could not be accounted for by remission of stress and pain in the ACT group as no between-group differences were found for stress or pain symptoms.

According to a recent report from the State Department of Sweden, the frequency of persons on long-term sick leave and subsequent early disability pension is one of the highest in the world (Rydh, 2002). During the past 4 years

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the number of persons on sick leave exceeding 365 days has increased approximately 30% per year, followed by a corresponding increase of persons receiving early disability pensions. The combination of persons on long-term sick leave and those receiving early disability retirement constitute about 14% of the working-age population of Sweden.

Countries within the European community (EC) have a nationally financed social welfare, health care, and insurance system for unemployment, disabilities, illness, poverty, and aging. The costs for meeting the national health-care needs vary within the EC and as compared to these costs in the U.S. The average health-care costs in 1995 within the EC countries were 49% of the GNP as compared to 34.4% in the U.S. Within the EC, these costs have been observed to vary according to the relative generosity of the benefit system. Sweden, for example, has among the most generous system of benefits in the EC and spent 64% of its GNP in 1994 in order to provide them (Nordlund & Waddell, 2000).

Rydh (2002) compared persons employed in private, state, county, and local community settings and found that women working in community public health services were consistently highest in the use of sick leave and disability pensions. Community public health services in Sweden consist of care for the elderly, persons with different disabilities, child daycare, as well as teaching in the public schools and after-school care. Between the years of 1997 and 2001 the number of sick days for women doubled from 15 to 31 days per year. During January of 2002, a change in sick leave policy allowed Swedish workers to be eligible for sick pay on their first day sick—with no waiting period. Sick leave for public health workers rose even more dramatically to an average of 46 days in 2002 (Rydh, 2002). Nordlund and Waddell (2000) have reported similar increases in the United Kingdom and in the Netherlands.

The most common symptoms reported for sick leave are pain in neck, shoulders, and back, as well as more diffuse stress-related symptoms such as fatigue. Traditionally, treatment programs for stress and pain have been based on the assumption that heavy or stressful workload and resulting strained and tense muscles caused increases in sick leave. However, according to a recent meta-analysis done by The Swedish Council on Technology Assessment in Health Care (SBU) on the prevalence, causes, treatment of chronic pain and resulting sick leave, no simple work-related causes could be found (Nachemson, 1998; Vingård & Nachemson, 2000). This report also showed that traditional treatments based on symptom alleviation such as sick leave, bed rest, heat and cold therapy, ultrasonic treatment, analgesic medication, epidural steroid injections, acupuncture, and massage have been shown to produce little or no long-term benefit.

Behavior therapy for the treatment of chronic pain is an exposure-based model first developed by Fordyce (1976). The model was further developed and elaborated in the form of cognitive behavior therapy (CBT) by others (Flor, 1997; Linton, 1995; Turk, Meichenbaum, & Genest, 1983; Vlaeyen, Haazen, Shuerman, Kole-Snijders, & Eek, 1995). Briefly, this model proposes that the pain experience alone does not necessarily lead to dysfunction.

However, if the pain experience associated with an activity, movement, or workplace leads to avoidance of those stimuli, dysfunction is likely to occur. If the individual believes that the cause of his or her symptoms is the workplace or work tasks, he or she is likely not to go back to work. CBT for chronic pain follows the strategy of helping the person to expose him- or herself to activities, movements, or workplaces that he or she has avoided. The CBT model expands on the original behavioral model by including interventions such as reconstructing thoughts about pain, reconceptualization, and reinterpreting sensations, among others (Turk et al., 1983). CBT treatment for pain begins by setting exposure at nonpainful levels and gradually increases activity. The goal is to ensure that treatment is minimally aversive so that patients gain increasing confidence in their abilities.

### Acceptance and Commitment Therapy as a Contemporary Behavioral Treatment for Pain

One of the problems with exposure in the treatment of pain is that it is by definition aversive, at least in thought, for the patient. The patient is asked to expose him- or herself to movements, work tasks, and work places that are associated with pain. Because some inherent discomfort is involved, it can be difficult to motivate clients to engage in exposure-based treatment. Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 1999; Hayes & Wilson, 1994; Wilson & Luciano, 2002) uses traditional exposure-based procedures, but expands on them in at least three significant ways: expanding exposure, defusing inflexible cognition, and clarifying values.

ACT focuses on experiential avoidance as a core pathogenic process (Hayes et al., 1999; Hayes, Wilson, Gifford, Follette, & Strosahl, 1996; Wilson, Hayes, Gregg, & Zettle, 2001). Experiential avoidance with regard to chronic pain would occur when a person is unwilling to remain in contact with particular private experiences (e.g., pain sensations; emotions, thoughts, or memories associated with pain) and takes steps to alter the form or frequency of these events and the contexts that occasion them. As a result, ACT expands exposure to include both interoceptive cues, such as pain sensations, as well as a variety of pain-associated cognitions, emotions, and memories that a client might avoid. This intervention differs from traditional cognitive therapy interventions for chronic pain and thoughts: the ACT therapist uses negative thoughts associated with pain as targets for exposure rather than attempting to illuminate their irrational nature.

The second expansion of the ACT approach to chronic pain is defusion of inflexible cognition. From an ACT perspective, it is not the content of those thoughts associated with pain that is problematic but the individual's response to the pain and stress thoughts. In contrast to some CBT for chronic pain, ACT does not attack the validity of negative cognition associated with pain; rather, it targets the process of responding to the avoided contents of cognition. As in our description of exposure, the purpose of this intervention is to

foster a mindful and accepting posture toward disturbing negative cognitive content associated with pain. Strategies that emphasize acceptance and openness to experience have emerged as promising intervention procedures for a variety of problems including stress and pain (Bond & Bunce, 2000; Kabat-Zinn & Chapman-Waldrup, 1988; Salmon, Santorelli, & Kabat-Zinn, 1998).

The third expansion of the ACT approach to chronic pain is the process of clarifying the workability of clients' attempts to control pain symptoms with respect to deeply held personal values. ACT uses a set of procedures to explore a client's life direction if she or he were living in a world where pain did not make such choices impossible (Hayes et al., 1999; Wilson & Luciano, 2002; Wilson & Murrell, 2004). Part of the structure of a client's agenda with respect to pain and stress symptoms is that once these symptoms are removed or lessened, he or she will be able to move on with his or her life. Clients with chronic pain often reveal valued life directions that have been "on hold" for a very long time. With the client, the therapist examines whether attempts at pain alleviation have moved him or her toward or away from valued life directions. Clients are invited to use these life directions as both a guide and motivation in the hard work of treatment.

Because thinking and talking about unfulfilled values can be quite painful (and avoided), this values work also overlaps with the expanded approach to exposure and defusion. Exposure is appropriate when avoided private events associated with pain become obstacles to behavioral activation and commitment to valued action. Defusion of cognitions is also necessary because clients who reflect on long-deferred values often have very negative evaluations about themselves and their capacity for change. ACT treatment of values also differs from most behavioral goal setting in that it targets broad valued domains, whereas the goals in behavior therapy for pain are typically of direct relevance to the work environment.

The purpose of this study was to make a preliminary evaluation of a brief ACT intervention at the work site for persons judged to be at risk for developing increasing symptoms of stress and pain and eventual use of medically ordered sick leave and/or long-term disability. Bond and Bunce (2000) examined ACT with respect to workplace stress and work performance. However, that study was not designed to target workers at risk for disability. In the present study, it is hypothesized that the addition of ACT to medical treatment-as-usual would lead to less focus on symptoms and more focus on valued domains of living and that this change would result in increased quality of life and less use of both sick leave and medical treatment. ACT did not target stress and pain for intervention. Instead, the intervention was aimed at altering the client's relationship with stress and pain. If ACT works in the ways that have been suggested here, functioning should improve with some degree of independence from level of stress and pain symptoms. Therefore, examinations were made with respect to level and intensity of symptomology at pre, post, and follow-up to test whether improvements in quality of life, sick leave, and medical utilization could be accounted for by symptom remission.

## Method

### *Participants*

A health screening of 1,000 public health service employees showed that approximately 75% had some daily pain or stress symptoms and had been sick listed for at least 3 periods of more than 7 days each over the past year. Of the group experiencing daily symptoms, individuals were excluded if they (a) had been on consecutive sick leave for more than 20 days during the past 12 months, (b) were currently on disability leave, (c) showed signs of progressive illness, such as cancer, or (d) were participating in another psychosocial treatment program. Inclusion criteria included both (a) daily stress symptoms that were in excess of 60% maximum ratings on a cluster of 15 stress symptoms and (b) daily pain ratings of 7 or more on the VAS scale (ratings derived from Linton & Hallden, 1998), and (c) a score of 8 or above on a rating of the participants' belief that their symptoms were caused by work. The latter is a major predictor of long-term sick leave (Linton & Hallden, 1998).

These inclusion and exclusion criteria reduced the pool to 220 persons. Twenty-four individuals were selected randomly and contacted. All 24 participants received a letter, approved by the Regional Ethical Committee, describing the aim, design, and content of the research project. The letters came to the workers via their employer and stated that the employees could participate in the study during regular work hours. All 24 individuals contacted agreed to participate.

The introductory letter described the study as a series of conversations about the causes and consequences of stress and pain. The letter informed participants that one condition would involve more meetings than the other. Participants had no contact with other members of their own treatment condition or the alternative condition. The investigators did not inform the participants whether they had been assigned to the condition with more or fewer visits.<sup>1</sup> Because the informed consent did not specify the precise number of sessions, participants were not able to discern to which condition they were assigned.

Baseline sick-leave data were collected for 6 months prior to the intervention. At the outset of the baseline collection, participants were distributed randomly into one of two conditions. Five participants declined to come in for the subsequent pretreatment intake, leaving 11 participants in the ACT condition and 8 participants in the control condition. Because participants were not aware of the treatment condition to which they had been assigned, attrition could not be attributed to any feature of treatment. The remaining 19 participants, who agreed to come to the intake, also completed treatment and assessments at post and follow-up.

<sup>1</sup>Specification of the duration of treatment, but not the precise number of sessions, was required by the Regional Ethics Board.

### *Treatment Conditions*

Participants included 17 women and 2 men, with an average age of 40 ( $SD = 13.2$ ) and a mean of 13 years ( $SD = 8.5$ ) in the work force. All participants had permanent employment. All but 2 participants were practical nurses or mental health workers with the equivalent of a high school education. These 2 exceptions had college educations and were in administrative positions.

*Medical treatment as usual (MTAU).* Swedish citizens have free access to medical care and these patients used a variety of medical resources including physician, specialist, and physical therapy visits. All subjects in both conditions had access to MTAU throughout the baseline, intervention, and follow-up period. One group ( $n = 8$ ) was assigned to continue to receive MTAU.

*ACT.* In the other treatment condition ( $n = 11$ ), participants were allowed ongoing free access to MTAU and were also provided with four 1-hour individual sessions of ACT conducted weekly at the work site or in the home. The four components and associated exercises in each of the four ACT sessions were values, defusion, exposure, and commitment as described in *Acceptance and Commitment Therapy* (Hayes et al., 1999). Exercises and metaphors used in these sessions all derived from this manual.

In all sessions, a variation of the Valued Living Questionnaire (VLQ) was used as a primary clinical tool. The VLQ (Wilson, 2002; Wilson & Groom, 2002) taps into 10 domains often identified as valued domains of living. Clients are asked to rate, on a scale of 1 to 10, the importance of the 10 domains, including (1) family (other than parenting and intimate relations), (2) marriage/couples/intimate relations, (3) parenting, (4) friendship, (5) work, (6) education, (7) recreation, (8) spirituality, (9) citizenship, and (10) physical self-care. Instructions were designed to lessen conventional constraints on answering by emphasizing that not everyone values all of these domains and that some areas may be more important, or important in different ways, at different times in an individual's life. On the second page of the questionnaire, clients are asked to estimate, using the same 1-to-10 rating scale, how consistently they have lived in accord with those values over the past week. Beginning in the first session, the items from the VLQ were arrayed on a diagram around a figure depicting the client. Together, the client and therapist generated brief statements for each domain that characterized the direction the client wanted to take in his or her life (see Figure 1). So, for example, one client who had lived a very restricted life wanted to work on the medical unit of a cruise ship so that she could see the world. The value engaged was not the new job itself—it was the value of moving in the direction of employment that was meaningful and vital. The therapist used this diagram in all sessions. The life compass was also used in all sessions. The life compass treats the client value metaphorically as an actual physical direction. The client is then asked whether a given coping strategy keeps them on course or takes them off course.

Session 1 was held within 1 week of the end of the baseline period. The components of this session include: (a) a brief validation of suffering and personal loss of life quality as indicated in the VLQ baseline reports; (b) constructing

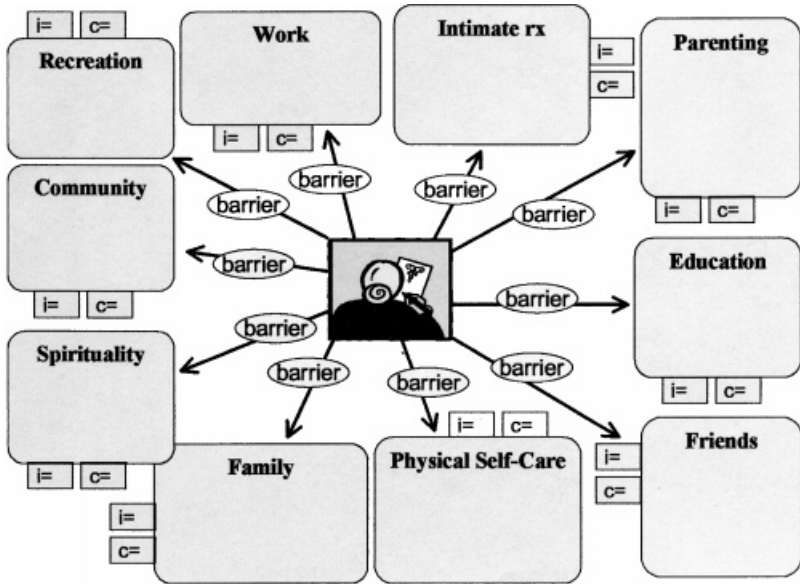


FIG. 1. Valued-domains from the VLQ were drawn on a whiteboard or paper showing the client, the domain, and the barriers. The therapist and client write in brief descriptions of the value in each domain. Clients rate importance and consistency in each domain ( $i$  = importance,  $c$  = consistency). Attempts to manage symptoms are examined as either facilitating movement in the direction of the value or as a barrier to moving in that direction.

a life compass based on the VLQ, including written intentions for each domain; (c) a functional analysis of barriers to acting consistently with intentions; (d) a functional analysis of the types of solutions the client has been pursuing; (e) exposure and defusion with negative thoughts and feelings that occur as barriers to valued action; and finally, (f) the client was asked to make a commitment to actions that were consistent with intentions listed in the VLQ.

Session 2 took place 1 week later and included all of the above components. The focus of this session was a more in-depth functional analysis of psychological barriers that emerged when the client attempted to move in valued directions identified in the first session. These barriers might include failure to keep the commitment and the thoughts and feelings the client had about that failure. The concept of acceptance of negative feelings was discussed and practiced in the form of mindfulness exercises. Common fears or unpleasant feelings associated with committed action were identified and exposure to them was practiced. Commitments were made at the end of this session.

Session 3 expanded on the work done in Session 2. For example, in the funeral exercise, the client takes an imaginal trip to his or her own funeral (Hayes et al., 1999). The client was asked to listen to what the attendees said

about the way that he or she had lived. The emphasis of the exercise was on the valued domains identified in previous sessions. “Stories” (reasons for not acting in consistency with values) were written on colorful cards by the client, and the card game—in which cards are first avoided and then accepted—was played (Hayes et al., 1999). The difference between unpleasant experience and avoiding unpleasant experience was examined and applied to different unpleasant experiences. Thoughts, emotions, bodily states, or other private events that occurred as barriers to moving forward were subject to exposure and defusion exercises.

The fourth and final session took place 1 week later and focused on allowing the client to independently present personal valued directions, typical “stories” as barriers, and how these “stories” can be approached and accepted as one moves in valued directions. The session ended with the client stating aloud long-term commitments regarding intentions listed in the 10 valued domains of the VLQ, along with examples of what activities would be consistent with those intentions.

### *Therapists*

Two therapists provided the ACT intervention. One was an experienced CBT psychotherapist, with a 1-day didactic and a 2-day experiential ACT training provided by the second author (KGW, a developer of this treatment). The second therapist was a registered nurse with no formal psychotherapy training. The nurse was under the supervision of the CBT therapist. The nurse and the CBT therapist met before and after each session to discuss the agenda for each session. Role-play of the session was used to check for the clarity of the treatment agenda. The experienced CBT therapist and the second author (KGW) were in regular telephone and e-mail contact throughout the study and discussed issues of implementation.

### *Dependent Measures*

Because this study was aimed at individuals deemed to be at high risk for sick-leave utilization and long-term disability, sick leave was the primary dependent measure. Secondary dependent measures included medical utilization and overall quality of life.

*Sick leave utilization.* Sick leave data were collected for each of 6 months during the baseline, during the month of treatment, and for 6 months following the treatment.

*Medical utilization.* At the pre, post, and 6-month follow-up assessments, participants were asked the number of times they had visited a physician, specialist, or physical therapist (self-report verified using archival data). The pre data consisted of medical visits occurring during the month prior to treatment. The medical visits at post consisted of all visits during the month of treatment. Finally, the 6-month follow-up data consisted of *all* visits during the 6 months following treatment.

*Quality of life.* Quality of life was assessed using the LSQ (Life Satisfaction



Questionnaire; Carlsson, Hamrin, & Lindquist, 1999). The LSQ was developed to assess the quality of life of women with breast cancer and has been widely used as an outcome instrument for treatment of chronic illness (la Fortune, 1995; Omne-Ponten, Holmber, Burns, Adami, & Bergström, 1992). The LSQ measures life satisfaction in the areas of physical health and social situation, including work, place of living, finance, and the quality of relationships with close friends and family members. This measure also includes a global measure of general life satisfaction. The LSQ has shown good reliability and validity (Carlsson et al., 1999; Carlsson & Hamrin, 1996).

### *Process Measures*

Self-rated stress and pain was assessed in order to examine whether any treatment effects on primary dependent measures could be attributed to lessened stress and pain.

*Stress.* Stress was assessed by summing the ratings on 14 stress symptoms from the Linton Screening instrument for pain (Linton & Hallden, 1998). Participants were asked to rate stress symptoms on a 0-to-3 scale, where 0 is *not at all* and 3 is *very much*.

*Pain.* Pain was assessed both by summing three pain symptoms (neck, shoulders, and low back pain), rated on a 0/1, absent/present scale, as well as by participant ratings on a pain intensity scale (0 = *no pain*, 10 = *unbearable pain*). Both the pain symptoms and pain intensity are derived from the Linton and Hallden (1998) screening instrument.

*Belief symptoms are caused by work.* The belief that symptoms were caused by work was obtained by asking the participants to rate their belief on an 11-point rating scale where 0 = *not at all* and 10 = *very much so* (Linton & Hallden, 1998).

## Results

### *General Data Analysis Strategy*

Data were analyzed initially using General Linear Model Repeated Measures analyses. Where significant overall treatment condition by time interactions were observed, independent *t* tests were carried out on the major data assessment points including posttreatment and the 6-month posttreatment follow-up. Because the study hypotheses were directional, in which case negative findings have the same implications as neutral findings (i.e., abandon the strategy), and in order to maximize power, one-tailed tests were used (see Abelson, 1995, and Hays, 1988, on appropriate use of one-tailed tests). Finally, no corrections for multiple tests were performed because (a) all tests involved a priori predictions of the outcomes of treatment, (b) the number of tests was relatively small, and (c) these tests were only carried out when justified by the significance of the overall repeated measures analysis (Keppel & Zedeck, 1989).

### *Pretreatment Status*

Prior to treatment, the two groups were not statistically different from one another on age (ACT  $M = 36.7$ ,  $SD = 12.5$ , MTAU  $M = 44.4$ ,  $SD = 13.6$ ), job tenure (ACT  $M = 12.6$ ,  $SD = 6.4$ ; MTAU  $M = 13.4$ ,  $SD = 11.2$ ), duration of pain and stress symptoms (ACT  $M = 7$  years,  $SD = 6.4$ ; MTAU  $M = 7$  years,  $SD = 10.4$ ), gender (1 male per treatment condition), job type or education (1 college-educated administrator per condition), pain intensity (ACT  $M = 5.7$ ,  $SD = 2.1$ ; MTAU  $M = 5.9$ ,  $SD = 2.5$ ), number of pain symptoms (ACT  $M = 2.5$ ,  $SD = .8$ ; MTAU  $M = 2.6$ ,  $SD = 1.1$ ), presence of stress symptoms (ACT  $M = 14.6$ ,  $SD = 7.0$ ; MTAU  $M = 13.9$ ,  $SD = 9.0$ ), belief that symptoms were caused by work (ACT  $M = 7.1$ ,  $SD = 3.7$ ; MTAU  $M = 8.9$ ), sick leave utilization during the month prior to intervention (ACT  $M = 4$ ,  $SD = 9.1$ ; MTAU  $M = 3.75$ ,  $SD = 5.8$ ), or medical utilization during the month prior to intervention (ACT  $M = 3.64$ ,  $SD = 5.3$ ; MTAU  $M = 5.75$ ,  $SD = 4.4$ ).

### *Primary Dependent Variables*

*Sick leave utilization.* Analyses of sick leave involved 13 successive data points (6 months prior to treatment, once at the end of the treatment month, and 6 months following treatment). A repeated-measures ANOVA showed a significant Treatment  $\times$  Time interaction,  $F(12, 204) = 3.34$ , partial eta squared = .16,  $p = .0002$ . Participants in the ACT condition used fewer sick days than those in the MTAU condition. Figure 2 shows a divergence in sick leave during the treatment and follow-up period, but not during the baseline. There was a very low level of sick leave use in both groups for months 1 through 4, with a similar rise in sick leave for both groups just prior to the intervention. Sick leave returned to near zero for the ACT group at posttreatment, and remained there throughout follow-up. In contrast, the MTAU condition showed higher utilization posttreatment, and this high level of utilization continued throughout the 6-month follow-up.<sup>2</sup>

Separate independent samples  $t$  tests were used to examine mean differences at post and 6-month follow-ups. The ACT condition showed significantly fewer days of sick leave at posttreatment,<sup>3</sup> with ACT participants showing a

<sup>2</sup> The dramatic differences seen in sick-leave utilization should be understood in light of two significant facts. First, these subjects were selected explicitly because they showed major risk factors that predict sick leave, but were not yet using sick leave. The treatment was intended to *prevent* high utilization. Second, the implementation of treatment coincided precisely with a change in sick-leave policy in Sweden that allowed workers to be paid beginning on the first sick day, with no waiting period. This change in policy resulted in increases in sick-leave utilization throughout Sweden. However, this policy change appeared to have had no effect on the subjects in the ACT treatment condition. By contrast, subjects in the MTAU condition ended the year with a level of sick-leave utilization commensurate with their risk status and with increasingly generous sick-leave policies.

<sup>3</sup> Because the differences in treatment conditions were so profound, in some instances, Levine's test for homogeneity of variance was significant. For example, the participants in the ACT treatment condition showed no sick-leave usage at all during follow-up months 2, 4, and 5.

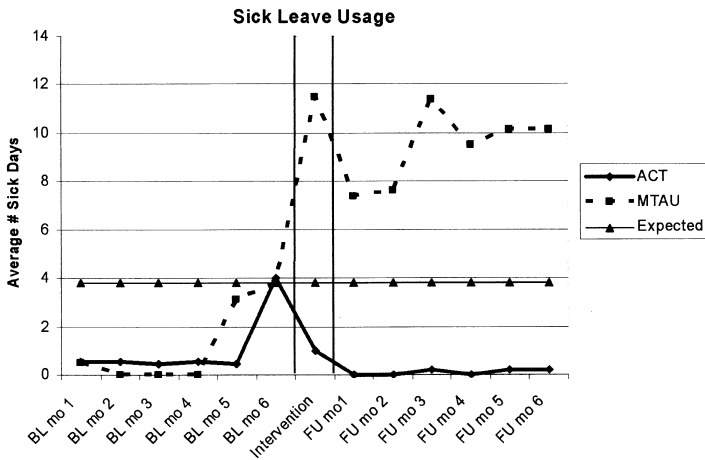


FIG. 2. Mean number of sick days per month for the ACT and MTAU groups with 6 months of baseline and 6 months of follow-up data. Mean sick days for all Swedish public health workers are also plotted using 2002 statistics.

mean of 1 sick day ( $SD = 2.3$ ) versus a mean of 11.5 sick days for the MTAU condition,  $SD = 12.5$ ,  $t(7.35) = -2.34$ ,  $p = .025$  (see footnote 3). These improvements were retained and widened at 6-month follow-up, with ACT participants showing an average of .5 sick days ( $SD = 1.8$ ) during the 6-month posttreatment follow-up period versus a mean of 56.1 days for the MTAU condition,  $SD = 78.9$ ,  $t(7.0) = -1.99$ ,  $p = .043$  (see footnote 3). As an additional comparison, public health workers, as a group, would have been expected to use 49.8 days over the 13-month course of the study (using 2002 estimates). In contrast, the ACT and MTAU subjects used an average of 8.1 and 75 sick days, respectively.

### Secondary Dependent Measures

**Medical utilization.** Medical visits were collected for the month prior to treatment, for the month participants were in treatment, and for the 6-month period following treatment. Repeated measures ANOVA showed an overall Treatment Condition  $\times$  Time interaction favoring the ACT condition,  $F(1.15, 19.55) = 4.77$ ,<sup>4</sup> partial eta squared = .22,  $p = .037$  (see Figure 3). Independent samples  $t$  tests showed no significant difference in the number of medi-

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Because there was no sick-leave usage, there was no variance. Where Levine's test was significant, the corrected degrees of freedom,  $t$ -statistic, and  $p$ -value provided by SPSS Version 11.0 were used.

<sup>4</sup>On repeated-measures analyses, where Mauchly's test of the sphericity assumption was significant, the Greenhouse-Geisser corrected degrees of freedom, mean square,  $F$ , and  $p$ -value provided by SPSS Version 11.0 were used.

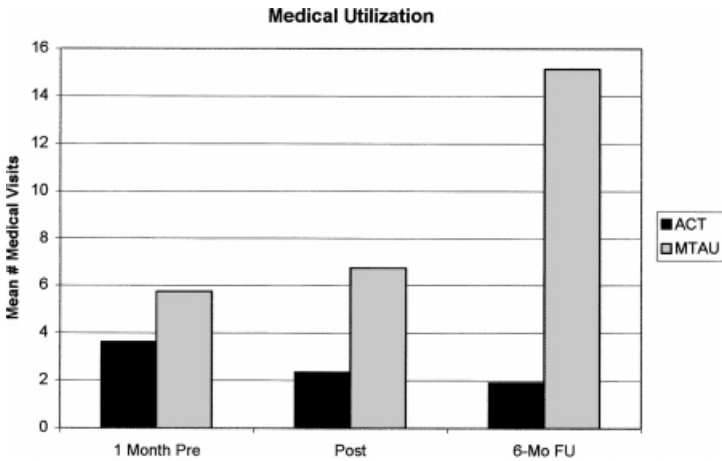


FIG. 3. Mean number of medical visits, including physician, specialist, and physical therapy visits, for the month preceding treatment, the month of treatment, and for the combined 6 months following treatment.

cal visits at the posttreatment assessment: ACT  $M = 2.36$ ,  $SD = 3.9$ ; MTAU  $M = 3.75$ ,  $SD = 6.2$ ,  $t(10.97) = -4.39$ ,  $p = .054$  (see footnote 3). The ACT condition showed significantly fewer medical visits at follow-up, with the ACT condition showing a mean of 1.9 medical visits during the 6-month follow-up period as compared to a mean of 15.1 visits in the MTAU condition ( $SDs$  respectively = 2.8 and 18.7,  $t[7.24] = -1.98$ ,  $p = .043$ ; see footnote 3).

*LSQ.* Repeated measures ANOVA revealed no significant Condition  $\times$  Time interaction,  $F(2, 34) = .67$ , partial eta squared = .04,  $p = ns$ . Improvements on the LSQ are indicated by lower scores. The ACT condition moved from 40 ( $SD = 8.9$ ) at pretreatment to 41.1 ( $SD = 8.4$ ) at post, and 39.6 ( $SD = 9.3$ ) at follow-up. The MTAU condition moved from 38.9 ( $SD = 8.1$ ) at pretreatment to 42.9 ( $SD = 5.3$ ) at post, and 43.2 ( $SD = 9$ ) at follow-up.

### Process Measures

*Self-reported stress symptoms.* Repeated measures ANOVA showed a main effect for stress with a lessening of self-reported stress symptoms over the course of treatment and follow-up,  $F(1.44, 24.64) = 5.7$  (see footnote 4), partial eta squared = .25,  $p < .016$ . There was no significant Condition  $\times$  Time interaction,  $F(1.45, 24.64) = .72$ , partial eta squared = .04,  $p = ns$ . The ACT condition moved from an aggregated stress rating of 14.6 ( $SD = 7$ ) at pretreatment to 9.3 ( $SD = 6.6$ ) at post, and 10.6 ( $SD = 7.8$ ) at follow-up. The MTAU condition moved from 13.9 ( $SD = 9$ ) at pretreatment to 9.5 ( $SD = 3.7$ ) at post, and 11.7 ( $SD = 5.3$ ) at follow-up.

*Number of self-reported pain symptoms and pain intensity.* Repeated measures ANOVA showed a main effect for pain symptoms with a lessening of

self-reported number of pain symptoms over the course of treatment and follow-up,  $F(2, 34) = 8.4$ , partial eta squared = .33,  $p = .001$ . There was no significant Condition  $\times$  Time interaction,  $F(2, 34) = .89$ , partial eta squared = .05,  $p = ns$ . The ACT condition moved from 2.5 ( $SD = .8$ ) symptoms reported at pretreatment to 1.6 ( $SD = 1$ ) at post, and 1.7 ( $SD = 1$ ) at follow-up. The MTAU condition moved from 2.6 ( $SD = 1.1$ ) at pretreatment to 2.1 ( $SD = 1$ ) at post, and 2.2 ( $SD = 1$ ) at follow-up. Pain intensity showed neither a main effect across time,  $F(2, 32) = .84$ , partial eta squared = .05,  $p = ns$ , nor an interaction between condition and time  $F(2, 32) = .10$ , partial eta squared = .01,  $p = ns$ . The ACT condition moved from a 5.7 ( $SD = 2.1$ ) pain intensity rating at pretreatment to 4.5 ( $SD = 3.4$ ) at post, and 4.5 ( $SD = 3.4$ ) at follow-up. The MTAU condition moved from 5.9 ( $SD = 2.5$ ) at pretreatment to 4.9 ( $SD = 3.1$ ) at post, and 5.3 ( $SD = 3.4$ ) at follow-up.

*Belief symptoms are caused by work.* Repeated measures ANOVA showed no main effect for belief that symptoms were caused by work over the course of treatment and follow-up,  $F(2, 34) = 10.15$ , partial eta squared = .09,  $p = ns$ . There was also no significant Condition  $\times$  Time interaction,  $F(2, 34) = 3.59$ , partial eta squared = .03,  $p = ns$ . The ACT condition moved from 7.1 ( $SD = 3.7$ ) belief rating at pretreatment to 4.8 ( $SD = 3.9$ ) at post, and 5.8 ( $SD = 3.8$ ) at follow-up. The MTAU condition moved from 8.9 ( $SD = 1.6$ ) at pretreatment to 8.3 ( $SD = 1.9$ ) at post, and 8.5 ( $SD = 2.5$ ) at follow-up.

## Discussion

This study was intended to examine the utility of a brief ACT intervention for the prevention of sick-leave utilization among public health employees who were at risk for use of medically scheduled sick leave and early medical retirement. If a brief, inexpensive intervention could show positive effects, it could extend the benefits provided by increasingly scarce health-care dollars to more individuals. Participants in the ACT treatment condition showed significantly less use of sick leave and significantly lower medical treatment utilization as compared to participants in the MTAU condition. In this sample, these differences were quite large.

### *Understanding Differences*

*Pain, stress, and beliefs about pain and stress as mediators of sick leave and medical utilization.* One possible explanation for these observed differences would be that symptoms causing sick leave and medical utilization had remitted among the individuals in the ACT condition, but not among those in the MTAU condition. Differences in beliefs about work causing symptoms might alter sick leave utilization, but should not alter medical utilization. The present findings are intriguing from an ACT perspective, since there were no between-groups differences on stress, pain intensity, number of pain symptoms, or beliefs that symptoms were caused by work. Thus, change in our primary dependent measures cannot be attributed to symptom remission.

### *Altering Client's Relationship With Adversity*

Reducing stress and pain is certainly a commendable goal. Any unnecessary discomfort or unpleasant working conditions that can be remedied should be corrected. However, difficult conditions are intrinsic to some tasks. Working with persons who are severely mentally and physically handicapped is physically and mentally stressful. The question remains: What will these individuals' relationship be with respect to this sort of adversity? Traditional medical interventions have aimed their efforts at directly reducing the experience of stress and pain. But, is it the case that taking this adversarial posture with respect to stress and pain leads to the best possible functioning? From an ACT perspective, over time, a posture of openness and acceptance should generate somewhat less psychological distress and a loosening of attachment to distressing beliefs.

The ACT intervention did not target pain or stress symptoms for removal, and did not intervene on the validity of beliefs about the causes of pain and stress. Instead, the ACT intervention used a variety of interventions aimed at altering the client's relationship with those symptoms and beliefs. The intended outcome of the ACT intervention was not necessarily that the symptoms remit, but that the client is able to act effectively, and with flexibility, even in the presence of symptoms. Improvements in functioning without symptom remission provides indirect evidence for the model as clients in the two conditions did appear to behave differently in the face of similar symptoms and beliefs about symptoms.

ACT directly targets effective living in valued domains. This should lead to improvements in quality of life, or, at minimum in a prevention study such as this, quality of life ought not deteriorate. In absolute terms, the ACT condition did show scores that improved slightly, while the MTAU condition showed a slight worsening of scores. While these changes are in the expected direction, they were too small in size to be considered reliable. The LSQ does not directly assess the domains targeted in ACT. For example, many LSQ items ask about symptom levels.

The expected outcome for symptoms in ACT is a matter of some complexity. On the one hand, ACT does not target the symptoms directly. On the other hand, the ACT model proposes that avoidance of symptoms may actually compound symptoms that might exist absent avoidance. Thus, the overall level of symptoms ought to lessen as acceptance of negative psychological content increases and as focus on valued life domains increases. According to the model, increasing acceptance should precede lessening of symptoms. Because of the size and complexity of measurement issues, the current trial cannot speak with authority to these processes.

### *Study Limitations*

This study has several methodological limitations. First, the study was a preliminary investigation and involved a small number of participants followed for a relatively short period of time. Thus, the reliability of the findings

is in question. The small number of participants makes impossible more complex analyses of mediators and moderators. Future studies should be of sufficient size to examine these more complex interactions.

Second, the range of participants was narrow. Participants were drawn from a highly specific work environment. Whether this approach would be useful for individuals drawn from more diverse work environments is not clear. This study also consisted almost entirely of women. Future work should examine the applicability to a more gender diverse sample.

Third, because there was no active or placebo comparison condition, the possibility that additional time in treatment was solely responsible for the effects cannot be ruled out. This latter seems unlikely, however, because the participants in the MTAU condition used significantly more medical care than those in the ACT condition. Participants in the MTAU condition had more contact with health-care professionals even considering the four extra psychosocial sessions in the ACT condition. Still, future studies should include some credible active placebo treatment that would rule out the effects resulting from additional treatment. Even more valuable would be a comparison between such a control condition, ACT, and traditional CBT for pain. Because the putative change processes in ACT and more traditional forms of CBT differ (Hayes et al., 1999), such a study could potentially yield both valuable process and outcome data.

Fourth, because of limitations imposed by client access, treatment setting, and budget, it was not possible to record and code sessions in order to independently assess whether treatment was delivered competently and as specified. Future studies should provide means to assess therapist adherence and competence.

Fifth, and probably most critical, future studies will need to address measurement problems, especially with respect to measuring putative change processes. If the effects of this treatment were to prove out in a larger sample, the change processes responsible for the outcome would still remain unclear. Although this is a challenge for ACT and other acceptance-based treatments, it likewise poses a substantial challenge for other types of psychotherapy. For example, more than 30 years beyond the introduction of cognitive therapy techniques, there continues to be considerable controversy over the mechanisms of change in cognitive treatments (e.g., Jacobson et al., 1996). The following assessment tools are needed for a robust analysis of ACT change processes: a measure of engagement in valued-life domains and measures of the level of acceptance of negatively evaluated thoughts, emotions, and bodily sensations, in combination with more traditional measures of the frequency and intensity of distressing symptoms. Several of these measures are under development by the second author (KGW) and colleagues. For example, the VLQ is being developed as an assessment instrument in addition to its use as a tool for clinical intervention (Wilson, 2002). In order to examine change in quality of life, from an ACT perspective, we will need reliable instruments that can assess satisfaction within these domains.

Finally, the use of the ACT model as a package makes impossible any analysis of the separate contribution of therapeutic elements. Because the ACT model has not been used previously for prevention of sick leave and medical utilization, it was thought that testing a full ACT package was an appropriate first research step. Future studies should dismantle the components of this package. Taking into account all of the limitations of this study, considering the brevity and economy of the intervention and its apparent efficacy in this preliminary trial, ACT for chronic stress and pain seems worthy of further investigation.

## References

- Abelson, R. P. (1995). *Statistics as principled argument*. Hillsdale, NJ: Lawrence Erlbaum.
- Bond, F. W., & Bunce, D. (2000). Mediators of change in emotion-focused and problem-focused worksite stress management interventions. *Journal of Occupational Health Psychology, 5*, 156–163.
- Carlsson, M., & Hamrin, E. (1996). Measurement of quality of life in women with breast cancer. Development of a Life Satisfaction Questionnaire (LSQ-32) and a comparison with the EORTC QLQ-C30. *Quality of Life Research, 5*, 265–274.
- Carlsson, M., Hamrin, E., & Lindquist, R. (1999). Psychometric assessment of the Life Satisfaction Questionnaire (LSQ) and a comparison of a randomised sample of Swedish women and those suffering from breast cancer. *Quality of Life Research, 8*, 245–253.
- Flor, H. (1997). *A way out of the vicious circle: Learning to manage pain through self-control*. Berlin: Humboldt University Press.
- Fordyce, W. (1976). *Behavioral methods for chronic pain and illness*. St. Louis: C. V. Mosby Press.
- Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and Commitment Therapy: An experiential approach to behavior change*. New York: The Guilford Press.
- Hayes, S. C., & Wilson, K. G. (1994). Acceptance and Commitment Therapy: Altering the verbal support for experiential avoidance. *The Behavior Analyst, 17*, 289–303.
- Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. F., & Strosahl, K. (1996). Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology, 64*, 1152–1168.
- Hays, W. L. (1988). *Statistics* (4th ed.). Chicago: Holt, Rinehart, & Winston.
- Jacobson, N. S., Dobson, K. S., Truax, P. A., Addis, M. E., Koerner, K., Gollan, J. K., Gortner, E., & Prince, S. E. (1996). A component analysis of cognitive-behavioral treatment for depression. *Journal of Consulting and Clinical Psychology, 64*, 295–304.
- Kabat-Zinn, J., & Chapman-Waldrop, A. (1988). Compliance with an outpatient stress reduction program: Rates and predictors of program completion. *Journal of Behavioral Medicine, 11*, 333–352.
- Keppel, G., & Zedeck, S. (1989). *Data analysis for research designs: Analysis of variance and multiple regression/correlation approaches*. New York: W. H. Freeman and Company.
- la Fortune, F. (1995). Breast cancer survivors: Concerns and coping. *Cancer Nursing, 18*, 35–46.
- Linton, S. (1995). An overview of psychosocial and behavioural factors in neck and shoulder pain. *Scandinavian Journal of Rehabilitation Medicine, 32*, 67–77.
- Linton, S., & Hallden, K. (1998). Can we screen for problematic back pain? A screening questionnaire for predicting outcome in subacute back pain. *Clinical Journal of Pain, 14*, 209–215.
- Mitchell, R. I., & Carmen, G. M. (1994). The functional restoration approach to the treatment of chronic pain in patients with soft tissue and back injuries. *Spine, 19*, 633–642.



- Nachemson, A. (1998). Back pain in the work-place: A threat to our welfare states. In D. Wolter & K. Seide (Eds.), *Berufsbedingete Erkrankungen der Lendenwirbelsäule* (Vol. 15, pp. 191–206). Berlin: Springer.
- Nordlund A., & Waddell, G. (2000). Samhället totala kostnader för ont i ryggen. [In back pain, neck pain: An evidence-based review]. *The Swedish Council on Technology Assessment in Health Care* (Vol. 2, pp. 297–309). Stockholm: SBU.
- Omne-Ponten, M., Holmber, L., Burns, T., Adami, H. O., & Bergström, R. (1992). Determinants of the psychosocial outcome after operation for breast cancer. Results of a prospective comparative interview study following mastectomy and breast conservation. *European Journal of Cancer*, 28A, 1062–1067.
- Rydh, J. (2002). Handlingsplan för ökad hälsa i arbetslivet. *The Swedish Council on Technology Assessment in Health Care* (Vol. 5). Available: <http://www.sjukforsakring.gov.se/>.
- Salmon, P. G., Santorelli, S. F., & Kabat-Zinn, J. (1998). Intervention elements promoting adherence to mindfulness-based stress reduction programs in the clinical behavioral medicine setting. In S. A. Schumaker, E. B. Schron, & J. K. Ockene (Eds.), *The handbook of health behavior change* (2nd ed., pp. 239–266). New York: Springer.
- Turk, D. C., Meichenbaum, D., & Genest, M. (1983). *Pain and behavioral medicine: A cognitive-behavioral perspective*. New York: The Guilford Press.
- Vingård, E., & Nachemson, A. (2000). Arbeta och ont i ryggen. In back pain, neck pain: An evidence-based review. *The Swedish Council on Technology Assessment in Health Care* (Vol. 2, pp. 185–234). Stockholm: SBU.
- Vlaeyen, J., Haazen, I., Shuerman, J., Kole-Snijders, A., & Eek, H. (1995). Behavioral rehabilitation of chronic low back pain: Comparisons of an operant treatment, an operant-cognitive treatment and an operant-respondent treatment. *British Journal of Clinical Psychology*, 34, 95–118.
- Wilson, K. G. (2002). *Valued Living Questionnaire working manual v. 11-13-02*. Available from the author at Department of Psychology, University of Mississippi, University, MS.
- Wilson, K. G., & Groom, J. (2002). *The Valued Living Questionnaire*. Available from the first author at Department of Psychology, University of Mississippi, University, MS.
- Wilson, K. G., Hayes, S. C., Gregg, J., & Zettle, R. D. (2001). Psychopathology and psychotherapy. In S. C. Hayes, D. Barnes, & B. Roche (Eds.), *Relational frame theory: A post-Skinnerian account of human language and cognition* (pp. 211–237). New York: Plenum.
- Wilson, K. G., & Luciano, C. (2002). *Terapia de Aceptación y Compromiso (ACT): Un Tratamiento Conductual Orientado a los Valores*. Madrid: Editorial Pirámide.
- Wilson, K. G. & Murrell, A. R. (2004). Values-centered interventions: Setting a course for behavioral treatment. In S. C. Hayes, V. M. Follette, & M. Linehan (Eds.), *Mindfulness and acceptance: Expanding the cognitive behavioral tradition* (pp. 120–151). New York: The Guilford Press.

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