A Trial of Home-Based Cognitive-Behavioral Therapy for Arthritis in a Regional Center

Case Report

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Abstract

Residents of rural and regional areas often have limited access to health care professionals. This study investigated the ability of a modification of the Arthritis Basics for Change program developed by the American Arthritis Foundation to improve psychosocial functioning in a group of individuals with osteoarthritis and rheumatoid arthritis who lived in northern Queensland. The program comprised five, home-based sessions spaced over three weeks incorporating an audio CD and two 10-minute telephone consultations. A total of 34 individuals (7 males, mean age 59 years) were randomly assigned to either an intervention group or a wait list control group. Measures were administered before, after and at three-months follow up and included the Arthritis Helplessness Index, Hospital Anxiety and Depression Scale, Health Assessment Questionnaire, and the Coping Strategies Questionnaire. Improvements in both groups were noted in helplessness, anxiety, and depression following the program and at a three-month follow up. No changes were observed for pain, disability, or coping skills across time and between groups. A higher proportion of individuals in the intervention group than in the control group attained clinically significant improvement on the HADS Depression scale. Despite the small sample size, results showed that some significant gains can be made through short, specifically tailored interventions.

Keywords: Arthritis; Cognitive-Behavioral Therapy; Anxiety; Depression; Pain.

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Introduction

Arthritis is the second most common chronic pain condition after back pain. The Australian Bureau of Statistics [1] reported that 14.8% of Australians had received a diagnosis of arthritis. With the prevalence of arthritis increasing with age, the increasing number of older people is predicted to lead to increased numbers of individuals experiencing this painful condition. Arthritis has an unpredictable course of action with uncertain prognosis. Taal et al., [2] report there are over 200 forms of arthritis, with osteoarthritis and rheumatoid arthritis being the most common. Osteoarthritis in particular is known to increase with age [3]. Treatment costs for osteoarthritis are high, particularly for advanced stages of the disease [4, 5]. Rheumatoid arthritis is less common, but also increases in prevalence with increasing age [3, 6]. Rheumatoid arthritis is an autoimmune disorder characterized by chronic inflammation and degeneration of the connective joint tissue [7, 8]. Treatment for most forms of arthritis involves physical rehabilitation, appropriate medication, and as a last resort, surgery.

As with most conditions leading to chronic pain, the disability associated with both common forms of arthritis is related to the interaction of biological, psychological, and social influences [9, 10] Appraisal of disease severity and ability to cope play an important role in the development and course of arthritis [11, 12]. Reviews have shown the importance of depression [13], anxiety [14], and helplessness [15] in addition to the obvious stressors of pain, fatigue, restricted mobility, reduced freedom in activities of daily living, and dependency.

Psychological interventions for individuals with arthritis have generally involved education, self-management techniques, and cognitive behavioral therapy (CBT) [16]. Education provides an increase in knowledge about arthritis [17], but in itself increased knowledge is insufficient for benefits for most people. Self-management techniques provide skills that individuals can use in daily functioning and more effective relationships with health care professionals. Cognitive behavioral therapy provides interventions for problem oriented dysfunctional habitual thoughts and beliefs that influence coping behaviors. CBT has been shown to be effective in the treatment of arthritis, leading to reduced pain intensity, perceived disability, depression, and anxiety and an increase in active coping skills [18].

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Most CBT interventions for arthritis pain are delivered in groups [18, 19] over 12 to 20 sessions. Such programs can be difficult to access by individuals residing in rural and regional areas where there are not multiple providers of such programs. Alternative forms of treatment for health conditions such as headache, insomnia or arthritis include methods such as bibliotherapy, contact via telephone or Internet, and traditional home study materials. Haddock et al. [20] reported that home-based treatments can be equivalent in outcome to those delivered directly. Self-management programs for people with arthritis have been shown to be effective in terms of reduced pain, improved vitality, self-efficacy and exercise [21, 22]. Indeed, the Arthritis Foundation in America has supported the Arthritis Basics for Change (ABC) [23] program, which builds upon earlier programs shown to be effective for underserved, rural populations.

The current study combined the documented success of CBT programs for people with arthritis, together with the presumed benefits of home-based, self-management programs for arthritis, such as the ABC. It was hypothesized that participants in the program would feel reduced helplessness, lower levels of anxiety and depression, pain and disability, and to have an increased sense of coping.

Method

Participants

Recruitment started four weeks prior to the first session and was via newspaper and radio advertising in addition to flyers to the general community, Arthritis Association groups, retirement villages, and medical practitioners. A total of 76 people with arthritis was recruited in response to the initial notice. Of these, 48 met admission and exclusion criteria that were checked by two senior clinical psychology students by telephone. These 48 attended the first session, at which time they were randomly assigned to treatment or wait list control groups. Fourteen (8 treatment, 6 control; 7 of each major type of arthritis) did not complete the program, dropping out at various stages due to illness or scheduling conflicts. Dropouts led to a final sample of 18 in the treatment group and 16 in the control group. The 34 final participants ranged in age from 34 to 81 years, with a mean of 59 years (SD = 13.6). The majority (n = 27) were female, and most participants had osteoarthritis (n = 21), with one individual having both osteoarthritis and rheumatoid arthritis.

Participants averaged 44 years of age (SD = 15.6) when first diagnosed, with an average of 15 years (SD = 12.4) duration of illness. Eighty-eight per cent were native English speakers, and the majority was married. Fifty per cent had a less than secondary education, with 15% having secondary education, and 35% some tertiary education. Forty-seven per cent were retired, with 38% still working full time and 15% were part-time workers. Ninety-one per cent were taking some form of medication for their arthritis.

Program

The Arthritis Control Therapy (ACT) Therapist's Manual included a timetable, telephone list of all participants, participant telephone call time preference sheet, therapist telephone instruction sheet and three telephone case note sheets for each participant. The manual ensured that no scheduled contact would be missed and that participants would be called at their preferred time of day. Two telephone contacts were scheduled for within the following three weeks during which the ACT program took place, with two sessions per week for two weeks for the exercises and readings and one in the final week.

The first content session of the ACT covered theories of pain including the gate control model. The second session introduced CBT while the third covered automatic thoughts. The fourth session covered facts investigation, and the fifth dealt with modifying thoughts and concluding the program. Each session lasted approximately 1 hour, plus 15 minutes for homework exercises. The telephone calls were highly structured to resolve problems and to improve motivation, and usually lasted no more than 15 minutes. After the final ACT session, materials were provided to the wait-list control group. Both groups were assessed again at 3 months after the final ACT session by mail survey.

Design and Statistical Power

Data were analyzed as a 2 x 3 analysis of variance with the three observations over time being a repeated measure. Multivariate analyses were used for measures with more than one scale. Clinical significance was evaluated using standard methods.

An initial power calculation with a medium effect size of 0.30 estimated power was 0.50 and over for change over time and 0.34 and higher for differences between groups. To obtain power of 0.80, 35 per group would be needed to detect differences between groups and 24 per group for change over time. The obtained power for a small between groups effect size of 0.13 with 34 cases and $\alpha = 0.05$ is 0.11.

Materials

Measures included the Arthritis Helplessness Index (AHI) [24], the Hospital Anxiety and Depression scale (HADS) [25], the two disability index scores and pain scale of the Health Assessment Questionnaire (HAQ) [26], and the Coping Strategies Questionnaire (CSQ) [27]. The 15-item AHI is reported by its developers to have test-retest reliability of 0.53 over a 12-month interval and internal consistency reliability of 0.69. Its authors report validity correlations with related measures. The HADS uses 7 items to assess each of anxiety and depression without reliance on somatic symptoms. It reportedly has internal consistency of 0.90 or higher for both scales. It has been validated against psychiatric rating scales and other self-report measures. The HAQ assesses disability arising from a rheumatic disease. Test-retest reliability figures range between 0.85 and 0.99, with a wide range of validity information for its three scales [28]. The CSQ assesses coping and is well-validated in arthritis research [29]. The authors report internal consistency reliabilities of 0.72 to 0.85 for the sub-scales.

Results

The groups did not differ from each other on any demographic measure. There also was no difference observed between those who dropped out and those who completed the program, with the exception of gender. Proportionately more women than men completed (n =27/34 versus 6/14). Means and standard deviations with values of coefficient alpha for the pre-test data are reported in Table 1.

Table 1. Descriptive statistics for outcome measures at pre-ACT.

Measure	Mean	Standard Deviation	Coefficient alpha
AHI	33.2	5.38	0.75
HADS Anxiety	5.1	3.38	0.82
HADS Depression	7.0	3.63	0.83
HAQ Standard Disability	1.0	0.55	0.84
HAQ Adjusted Disability	0.8	0.46	0.84
HAQ Pain[1]	1.4	0.56	-
CSQ Diverting Attention	2.3	1.62	0.88
CSQ Reinterpreting Sensation	1.5	1.22	0.78
CSQ Catastrophizing	1.5	1.20	0.78
CSQ Ignoring Sensation	2.8	1.54	0.88
CSQ Praying or Hoping	1.8	1.41	0.79
CSQ Coping Self-statements	4.2	1.24	0.84
CSQ Increased Activities	3.5	1.03	0.81

Note: 1 – This score is a single visual analog rating and calculating coefficient alpha is not possible. AHI = Arthritis Helplessness Index; HADS = Hospital Anxiety and Depression Scale; HAQ = Health Assessment Questionnaire; CSQ = Coping Strategies Questionnaire.

Figure 1 shows that helplessness on the AHI decreased over time for both groups ($F(2, 31\ df) = 4.97$, $p = 0.01$), which did not differ from one another according to the 2 x 3 analysis of variance ($F(1, 32\ df) = 0.43$, $p = 0.52$). Note that there are 4 data points for the control group in the figures and only three for the intervention group. The control group had two preliminary assessments as well as the post intervention and follow-up in order to control for non-treatment related changes over time during the time the ACT was conducted. Figure 2 gives scores for the Anxiety scale of the HADS, which improved over time ($F(2,27\ df) = 2.74$, $p <$ 0.05), which also did not differ between groups ($F(2,27\ df) = 0.13$, $p = 0.88$), both of whom improved over time.

Figure 3 illustrates scores on the HADS Depression scale, which did not differ over time ($F(2,60\ df) = 1.46$, $p = 0.24$) nor between groups. Figure 4 provides the scores on the Health Assessment Questionnaire for disability when not using supportive aids. There was neither a significant difference between groups nor over time.

Figure 1. Mean levels of AHI Helplessness at Pre-ACT, Post-ACT, & 3-month follow-up.
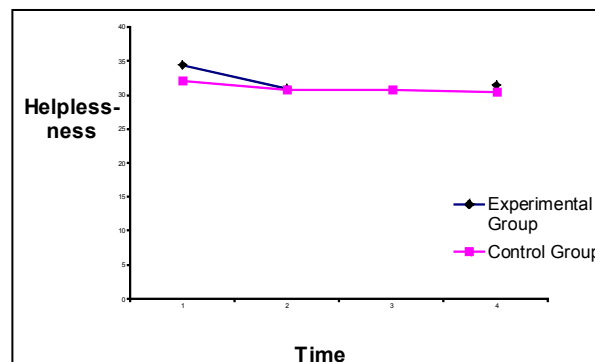

Figure 2. Mean levels of HAD Anxiety at Pre-ACT, Post-ACT, and 3-month follow-up.

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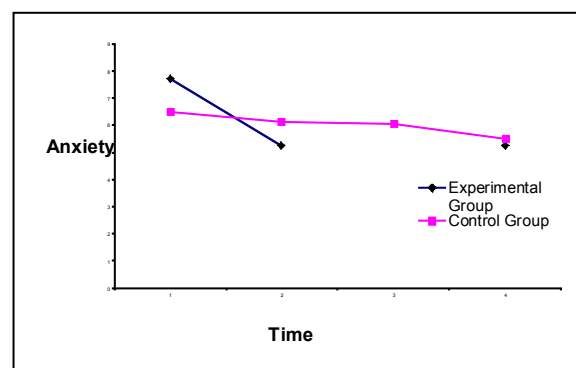
Figure 3. Mean levels of HAD Depression at Pre-ACT, Post-ACT, and 3-month follow-up.
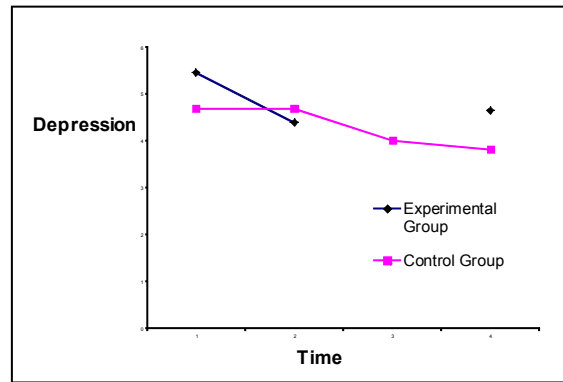

Figure 4. Mean levels of Disability at Pre-ACT, Post-ACT, and 3-month follow-up.
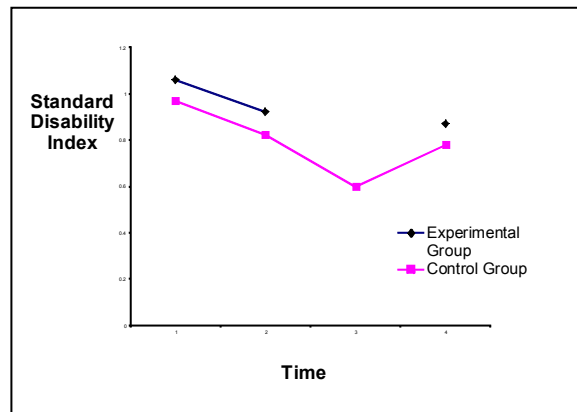

Figure 5. Mean levels of Adjusted Disability at Pre-ACT, Post-ACT, and 3-month follow-up.

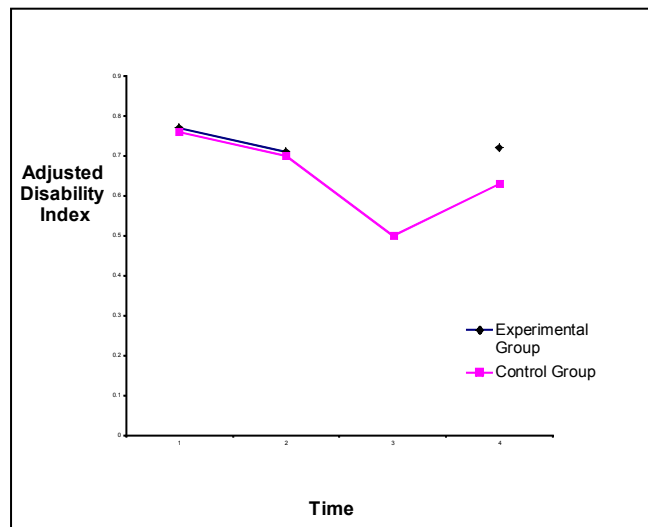**Figure 6. Mean levels of pain from HAQ at Pre-ACT, Post-ACT, and 3-month follow-up.**

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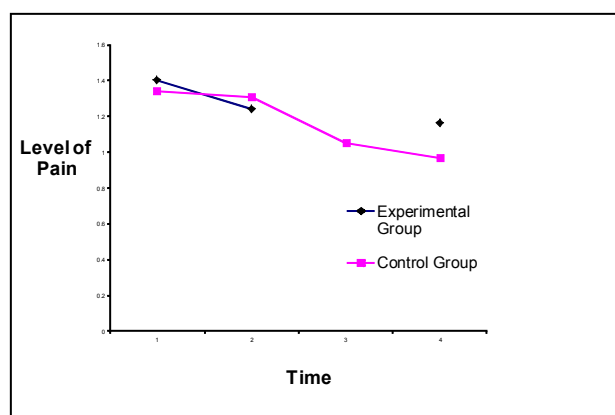
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Figure 5 reports Health Assessment Questionnaire scores for disability using supportive aids. Once again, there were no significant differences either over time (F (2, 27 df) =0.22, $p = 0.08$) or between groups (F(2, 30 df) = 0.28, $p = 0.84$). Health Assessment Questionnaire scores for its pain scale are given in Figure 6. There were no significant differences over time or across the two groups.

Multivariate analysis of scores on the CSQ was not statistically significant for group differences (F(2,20 df) = 0.87, $p = 0.57$) or for change over time (F (2,11 df) = 2.30, $p = 0.08$).

Using the criteria proposed by Jacobson and Truax [30] for clinical significance, scores within two standard deviations of the mean of 'normal' people were used for the HADS. The procedure for the other three measures used the equation [30] based on present data for two standard deviations from the mean of the combined groups. Higher numbers of people in the intervention group achieved criterion for clinically significant change in the intervention group than the control group for the Arthritis Helplessness Index (16.6% after vs. 11.1% before with the control group figures being 11.1% after and 5.5% before), but these differences between pre- and post-treatment were not significant by a comparison of two proportions ($z = 0.002$, $p = 0.99$). Pre- and post-treatment differences for probable and possible depression on the HADS were obtained (25% before and 0% after the intervention group for possible depression, 6.3% for the control group on both occasions ($z = 2.81$, $p = 0.005$). There were 6.3% on both occasions for the control group for probable depression with 12.5% to 0% for the experimental group ($z = 2.21$, $p = 0.027$. Frequencies declined from 25% to 6.35 vs. 12.5% on both occasions for the control group for probable anxiety ($z = 1.51$, $p = 0.13$) on the HADS and from 37.5% to 31.3% in the treatment group vs. 31.3% to 25% in the control group for possible anxiety ($z = 0$, $p = 0.99$). The number of cases showing functional levels of coping on the CSQ (largest difference was for Catastrophizing: intervention 93.3% to 73.3%; control 80% to 73.3%) was not significant ($z = 1.18$, $p = 0.14$).

Discussion

This paper reports on the results of a home-based, short-term CBT program for individuals with arthritis. The results failed to support the expected results, and showed improvement over time for both intervention and control groups in mean scores for helplessness, anxiety and depression, with no differences between intervention and control groups in these or other variables that were measured. There were some differences in the numbers of individuals showing clinically significant improvements, but the numbers doing so were not overwhelming. The improvement in numbers of people with possible and probable depression in the intervention group was one result supportive of the benefits of the ACT program.

Various factors may have influenced the observed outcome. An obvious factor is that the sample sizes were smaller than initially planned for and the dropout rate rather higher than expected. The net effect was to restrict the statistical power of the analyses that compared the two groups to modest levels around 0.11. At the same time, the observed differences were minimal for many of the measures used and significant group differences may not have obtained even with a much larger sample. It may be significant that Barsky et al., [21] also did not find differences in outcomes among three psychosocial interventions, but their larger

sample may have led to statistical significance through increased power.

An additional likely factor was the length of the ACT program itself, which may not have been sufficient to be effective [31]. For example, Kraaimaat et al., [32] reported that only moderate changes in pain coping were present after 10 sessions of CBT. This length was twice as many sessions as provided in the current ACT program. A further likely factor was that identical expectations were induced in both groups, with common orientation sessions and the possibility of communication between members of the two groups because of the relatively small community in which the data were collected. The extent to which change did occur suggests that home-based CBT interventions have some potential for improving function in people with arthritis in regional areas.

Future research should extend the current findings. Systematically varying the number of sessions of CBT to determine the optimal length to have an effective program would be very useful for many therapists. In addition, structured home-based programs such as the ACT compete with bibliotherapy for limited contact time with a therapist and the amount and nature of therapist contact should also be explored.

Acknowledgement

References

[1]. Australian Bureau of Statistics (2012) Australian Health Survey: First Results, 2011-12. Retrieved December 2, 2013 http://www.abs.gov.au/Ausstats

[2]. Taal E, Seydel ER, Rasker JJ, Weigman O (1993) Psychosocial aspects of rheumatic diseases: Introduction. Patient Education and Counseling 20: 55-61.

[3]. Arthritis Foundation (1996) The arthritis handbook. Sydney: MacLennan & Petty.

[4]. Lapsley HM, March LM, Tribe KL, Cross MJ, Brooks PM (2001) Living with osteoarthritis: Patient expenditures, health status, and social impact. Arthritis Care and Research 45: 301-306.

[5]. Ramsey SD, Spencer AC, Topolski TD, Belza B, Patrick DL (2001) Use of alternative therapies by older adults with osteoarthritis. Arthritis Care and Research 45: 222-227.

[6]. Taal E (2001) Rheumatoid arthritis: Psychosocial aspects. In HJ Smelser & PB Baltes (Eds.). International Encyclopedia of the Social & Behavioral Sciences, New York: Elsevier 13327-13330.

[7]. Corwin EJ (2000) Handbook of pathophysiology (2nd ed.). Baltimore: Lippincott Williams & Wilkins.

[8]. Gould, B. E. (2002). Pathophysiology for the health professions, Philadelphia, PA 526-528.

[9]. Kojima M, Kojima T, Ishiguro N, Oguchi T, Oba M, et al. (2009) Psychosocial factors, disease status, and quality of life in patients with rheumatoid arthritis. Journal of Psychosomatic Research 67: 425-431.

[10]. Nicassio PM, Kay MA, Custodio MK, Irwin MR, Olmstead R, et al. (2011) An evaluation of a biopsychosocial framework for health-related quality of life and disability in rheumatoid arthritis. Journal of Psychosomatic Research 71: 79-85.

[11]. Keefe F, Smith SJ, Buffington AL, Gibson J, Studts JLet al. (2002) Recent advances and future directions in the biopsychosocial assessment and treatment of arthritis. Journal of Consulting and Clinical Psychology 70:640-655.

[12]. Schoenfeld-Smith K, Petroski GF, Hewett JE, Johnson JC, Wright GE, et al. (1996) A biopsychosocial model of disability in rheumatoid arthritis. Arthritis Care and Research 9: 368-375.

[13]. Dickens C, McGowan L, Clark-Carter D, Creed F (2002) Depression in rheumatoid arthritis: A systematic review of the literature with meta-analysis. Psychosomatic Medicine 64: 52-60.

[14]. Creamer P, Lethbridge-Cejku M, Costa P, Tobin JD, Hrbst JH, Hochberg

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MC (1999) The relationship of anxiety and depression with self-reported knee pain in the community: Data from the Baltimore longitudinal study of aging. Arthritis Care and Research 12: 3-7.

[15]. Parker J, Smarr KL, Anderson S, Hewett J, Walker S, et al. (1992) Relationship of changes in helplessness and depression to disease activity in rheumatoid arthritis. Journal of Rheumatology 19: 1901-1905.

[16]. Barlow JH (1998) Arthritis. In AS Bellack & M Hersen (Eds.), Comprehensive clinical psychology, Elsevier Science. pp. 427-440

[17]. Lorig K, Konkol L, Gonzalez V (1987) Arthritis patient education: A review of the literature. Patient Education and Counseling 10: 207-252.

[18]. Morley S, Eccleston C, Williams A (1999) Systematic review and meta-analysis of randomized controlled trials of cognitive behaviour therapy and behaviour therapy for chronic pain in adults, excluding headache. Pain 80: 1-13.

[19]. Lorig K, Gonzalez VM, Ritter P (1999) Community-based Spanish language arthritis education program: a randomized trial. Medical Care 37: 957-963.

[20]. Haddock SK, Rowan AB, Andrasik F, Wilson PG, Talcott GW, et al. (1997) Home-based behavioral treatments for chronic benign headache: A meta-analysis of controlled trials. Cephalalgia 17: 113-118.

[21]. Barsky AJ, Ahern DK, Orav EJ, Nestoriuc Y, Liang MH, et al. (2010) Seminars in Arthritis and Rheumatism 40: 222-232.

[22]. Fries JF, Carey C, McShane DJ (1997) Patient education in arthritis: Randomized controlled trial of a mail-delivered program. Journal of Rheumatology 24: 1378-1383.

[23]. Arthritis Basics for Change. Retrieved January, 19, 2004.

[24]. Nicassio PM, Wallston KA, Callahan LF, Herbert M, Pincus T (1985) The measurement of helplessness in rheumatoid arthritis. The development of the Arthritis Helplessness Index. Journal of Rheumatology 12: 462-467.

[25]. Zigmond AS, Snaith RP (1983) The hospital anxiety and depression scale. Psychiatrica Scandinavica 67: 361-370.

[26]. Fries JF, Spitz P, Kraines G, Holman H (1980) Measurement of patient outcome in arthritis. Arthritis and Rheumatism 23: 137-145.

[27]. Rosenstiel AK, Keefe FJ (1983) The use of coping strategies in chronic low back pain patients: Relationship to patient characteristics and current adjustment. Pain 17:33-44.

[28]. Ramey DR, Fries JF, Singh G (1995) The Health Assessment Questionnaire – Status and review. In B Spilker (ed.). Quality of life and pharmacoleconomics in clinical trials, Philadelphia: Lippencott-Raven, pp. 227-237.

[29]. Tan G, Jensen MP, Robinson-Whelen S, Thornby JL, Monga TN (2001) Coping with chronic pain: A comparison of two measures. Pain 90: 127-133.

[30]. Jacobson N, Truax P (1991) Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. Journal of Consulting and Clinical Psychology 59: 12-19.

[31]. Barlow DH (2004) Psychological treatments. American Psychologist 59: 869-878.

[32]. Kraaimaat FW, Brons MR, Geenen R, Bijlsma JW (1995) The effects of cognitive behavior therapy in patients with rheumatoid arthritis. Behavior Research and Therapy 33: 487-595.

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