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J Atten Disord 2010; 13; 516 originally published online Apr 3, 2009;
DOI: 10.1177/1087054709332069

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Cognitive-Behaviorally-Oriented Group Rehabilitation of Adults With ADHD

Results of a 6-Month Follow-Up

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Objective: Recently, novel psychological treatments for adult ADHD have been reported with promising results. However, studies about long-term treatment effects are scanty. The authors study effects of cognitive-behaviorally-oriented group rehabilitation during a 6-month follow-up. Method: Participating in the rehabilitation were 29 adults, of whom 25 were reached 3 and 6 months later. ADHD and other psychiatric symptoms were assessed with self-ratings (Brown ADD Scale for Adults, Symptom Check List–90 [SCL-90], 16 ADHD-related items of SCL-90, Beck Depression Inventory). Participants from the pretreatment period served as their own controls. Results: Participants having improvement in ADHD symptoms during treatment (n = 11) maintained most of the benefit during follow-up. They also had a decrease in other psychiatric symptoms, but this did not fully persist through the follow-up. Of all participants, 72% found their overall situation improved as compared to the pretreatment situation. Conclusion: Results suggest that cognitive-behaviorally-oriented group rehabilitation of ADHD adults might have long-term benefits. (J. of Att. Dis. 2010; 13(5) 516-523)

Keywords: ADHD; adult ADHD treatment; rehabilitation; cognitive-behavioral therapy; follow-up

ADHD is a developmental neurobiological disability that emerges in childhood with symptoms of inattention and/or impulsivity and hyperactivity (American Psychiatric Association, 1994). Although previously considered a childhood disorder, ADHD often persists into adulthood as well (for a review, see Brassett-Harknett & Butler, 2007). In fact, the prevalence of adult ADHD was estimated to be as high as 4.4% in a recent American survey (Kessler et al., 2006). At adult age, ADHD is typically manifest as considerable difficulties in managing the many adult challenges and responsibilities of education, work, personal economy, and/or social relationships (Goodman, 2007). At a symptom level, there are deficits of organizing, prioritizing, and activating oneself to work; focusing, sustaining, and shifting attention to tasks; regulating alertness, sustaining effort, and processing speed; managing frustration and modulating emotions;

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utilizing working memory and accessing recall; and/or monitoring and self-regulating action (Brown, 2005). Some of the adults also continue to have symptoms of hyperactivity, albeit often limited to feelings of restlessness. Also, psychiatric comorbidities such as anxiety, depression, bipolar disorder, personality disorders, and substance use disorders are common (Biederman, 2004; Jacob et al., 2007; McGough et al., 2005; Sprafkin, Gadow, Weiss, Schneider, & Nolan, 2007).

The most extensively studied and well-established treatments of adult ADHD are pharmacological. Recently, there has also been a growing interest in developing and evaluating psychotherapeutic and other psychological interventions, based on the observation that pharmacological treatments alone are not always sufficient or suitable for all adults with ADHD. Both individual cognitive-behavioral therapy (Rostain & Ramsay, 2006; Safren et al., 2005; Wilens et al., 1999) and group interventions (Hesslinger et al., 2002; Philipsen et al., 2007; Solanto, Marks, Mitchell, Wasserstein, & Kofman, 2008; Stevenson, Whitmont, Bornholt, Livesey, & Stevenson, 2002; Virta et al., 2008) have yielded promising results, as measured with self-ratings and/or independent evaluations. However, studies about long-term treatment gains are scanty, and the need for follow-up data has been stressed (Knouse, Cooper-Vince, Sprich, & Safren, 2008). Thus far, only Stevenson et al. (2002) have reported a systematic post-treatment follow-up of their participants. In their study, the treatment group of 22 ADHD adults was followed up at 2 months and 1 year after completing the cognitive remediation program. It was found that the improvement of ADHD symptomatology and organizational skills, observed after the treatment, was still preserved 1 year posttreatment. Depending on the outcome measure, 17% or 50% of the participants were defined as responders at 1-year follow-up.

In our previous article (Virta et al., 2008), we evaluated the utility and efficacy of a new cognitive-behaviorally-oriented group rehabilitation specifically tailored for treating adult ADHD. It was found that the rehabilitation resulted in reduced self-reported ADHD symptoms, evident at the end of treatment. Here, our aim was to further evaluate the results of the program by determining (a) whether the improvement in ADHD symptoms was still maintained during a 6-month follow-up, (b) whether there was any change in other psychiatric symptoms during the follow-up, and (c) whether there was any self-perceived change in the overall situation of the participants.

Method

Overview of the Study Design

In all, 29 adults with ADHD underwent the cognitive-behaviorally-oriented group rehabilitation. Their ADHD symptoms were evaluated with self-ratings and ratings of the significant others 3 months before treatment (T1), at the beginning of treatment (T2), and at the end of treatment (T3). The 3-month waiting period (T1 to T2) was used as a control measure for the changes during treatment (T2 to T3), participants thus serving as their own controls. Follow-up data were then collected for 25 participants 3 months (T4) and 6 months (T5) after the treatment. Results for T1, T2, and T3 have been published earlier (Virta et al., 2008). Here, we present results for the follow-up (T4 and T5).

Participants

The inclusion criteria of the participants were (a) 18 to 45 years of age, (b) ADHD diagnosis made by a physician experienced in ADHD, (c) no diagnosis of schizophrenia, bipolar disorder, or intellectual disability, (d) no current alcohol dependency or drug use, (e) no current severe psychiatric problems, and (f) commitment to the program and capability to work in a group. Further details of the recruitment and selection procedures are described elsewhere (Virta et al., 2008).

Despite several persistent attempts, 4 of the original 29 participants (14%) could not be reached for the 3- and/or 6-month follow-up. When screening for possible common factors for them (e.g., gender, education, level of ADHD symptoms, number of attended rehabilitation sessions), none were found.

Altogether, there were 25 participants in the follow-up, of which 12 were men and 13 were women. They were 19 to 45 years old (Median = 31). In all, 17 participants (68%) had medication for ADHD at the beginning of rehabilitation; 11 of them had methylphenidate, 4 had dextroamphetamine, 1 had methylphenidate combined with modafinil, and 1 had dextroamphetamine combined with modafinil. During the rehabilitation, one participant ceased her medication of methylphenidate and another switched from methylphenidate to dextroamphetamine. During the 6-month follow-up, 3 participants ceased their methylphenidate medication, 1 started methylphenidate, and 1 who had stopped her methylphenidate medication during rehabilitation started it again. Medication information for 1 participant was missing at the 6-month follow-up.
All participants gave their written informed consent prior to participating in the study. The study was approved by the Ethics Committee of Helsinki University Central Hospital, Helsinki, Finland, and was conducted according to Declaration of Helsinki principles.

Group Rehabilitation and the Follow-Up Sessions

Cognitive-behaviorally-oriented group rehabilitation was carried out according to the detailed written manual (Leskelä et al., 2007). It consisted of 10 or 11 weekly sessions led by a psychologist. The sessions were constructed around specific themes considered important in ADHD (Brown, 2005): neurobiology of ADHD, motivation and initiation of activities, organization, attention, emotional regulation, memory, communication, impulsivity, psychiatric comorbidities, and self-esteem. Themes and compensatory strategies related to them were discussed using, for example, semistructured group conversations, group or pair work, theme-related homework, and self-reflective inquiries. There were four groups altogether, each having six to eight participants. The content and procedure of the rehabilitation were described in detail earlier (Virta et al., 2008).

To collect the follow-up data, all participants were invited to two follow-up group sessions which were held approximately 3 and 6 months after the treatment. When unable to attend the session, follow-up data were collected via mail. Follow-up sessions started with filling in the outcome measures. After this, there was an informal group conversation on two topics introduced by the psychologist. First, the participants were asked to tell “one thing that has improved in your life or one thing where you have succeeded.” These were then talked about in an encouraging fashion. Second, they were asked to tell “one problem that you still have.” These problems were subsequently discussed together so that the participants and also the psychologist suggested ways to deal with the problem. At the very end of the last follow-up session, preliminary results of the study were also briefly presented to the participants. Follow-up sessions and data collection were usually performed by the same psychologist who had conducted the group rehabilitation.

Outcome Measures

Data for the 3-month and 6-month follow-ups were collected 63 to 104 days (Mdn = 90 days) and 175 to 217 days (Mdn = 182 days) after the treatment, respectively. They consisted of the same questionnaires that were collected at T1, T2, and T3 (Virta et al., 2008). Of these, significant others’ ratings could not be used in the analyses because of the high amount of missing data. In addition, data regarding self-rated symptoms according to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 1994; 18 items, yes–no) were excluded because the measure was not sensitive to the treatment effect during rehabilitation (i.e., from T2 to T3).

Maintenance of the treatment benefit was then assessed with two self-report measures of symptoms characteristic of ADHD: Brown Attention-Deficit Disorder Scale–Adult Version (BADDs; Brown, 1996) and Symptom Check List–16 (SCL-16; Hesslinger et al., 2002), which is a 16-item sum score calculated from SCL-90 (Derogatis, Lipman, & Covi, 1973). At the end of rehabilitation, improvement was most clearly seen in these two measures (Virta et al., 2008).

Other psychiatric symptoms were assessed with the second edition of the Beck Depression Inventory (BDI-II; Beck, Steer, & Brown, 1996) and with SCL-90, which covers several psychiatric symptom dimensions (Derogatis et al., 1973). During the rehabilitation, there was a decreasing trend in SCL-90 but no statistically significant group-level changes (Virta et al., 2008).

In addition, at T5, participants filled in a questionnaire where they were asked to evaluate their overall present situation in comparison to their pretreatment situation at T2 (i.e., “Please compare your present situation with your situation before the rehabilitation.”). There were five response alternatives: markedly worse, somewhat worse, similar or no difference, somewhat better, and markedly better. Also, participants’ own explanations for this were requested with an open-ended question (i.e., “Why do you think this is so?”).

Statistical Analyses

Missing values of the questionnaires were replaced with the participant’s personal mean. However, when more than 20% of the answers were missing, the whole questionnaire was regarded as a missing observation and replaced with the group mean. This was done only once. Distribution properties of variables were investigated visually and with Shapiro-Wilk tests. Square root transformation was performed for BDI-II variables to obtain normality. Parametric tests were then chosen for all analyses.

For the purpose of the analyses, the participants were classified into two groups according to their individual improvement or nonimprovement during the rehabilitation.
An individual percentage of symptom change was first calculated for each participant in BADDS total score and SCL-16, between T2 and T3 \(((T2 - T3) + T2) \times 100\). An average change percentage was then calculated for each participant from the two measures \((\text{BADDS change percentage} + \text{SCL-16 change percentage}) + 2\). Participants having at least 20% average symptom reduction were defined as “improved” and otherwise “nonimproved.”

The maintenance of the improvement in ADHD symptoms (i.e., BADDS total score, SCL-16 sum score) during the follow-up was analyzed with mixed between repeated measures ANOVA (2 \(\times\) 5 time point design) and planned contrasts (T2 vs. T4, T2 vs. T5, T3 vs. T4, and T3 vs. T5), which were conducted separately for the improved and nonimproved groups. It was recognized that the interaction effects of the repeated measures ANOVAs would probably be enhanced because of the interaction inherently present between T2 and T3 because of the group formation criteria. This analysis method was chosen, however, because we were also interested in comparisons between the beginning of treatment and follow-up time points (i.e., T2 vs. T4 and T2 vs. T5). Other psychiatric symptoms (i.e., BDI-II score, SCL-90 total score) of the improved and nonimproved groups were analyzed with similar repeated measures ANOVAs and planned contrasts with the exception of one additional comparison, T2 vs. T3. This was included to reveal possible group-differences during rehabilitation. Partial eta squared (\(\eta_p^2\)) was used as a measure of effect size. All statistical computations were performed using SPSS for Windows (Version 14.0).

Results

Maintenance of the Improvement in ADHD Symptoms

Of the 25 participants, 11 (44%) were defined as improved and 14 (56%) as nonimproved. BADDS total scores of the two groups at each time point (i.e., T1, T2, T3, T4, and T5) are presented in Figure 1. A significant main effect of measurement time point, Greenhouse–Geisser (G-G) corrected \(F(2.49, 57.37) = 3.57, p < .05, \eta_p^2 = .13\), and interaction effect of measurement time point and group, G-G corrected \(F(2.49, 57.37) = 3.73, p < .05, \eta_p^2 = .14\), were found in the repeated measures ANOVA. No significant change of BADDS symptoms was found in the planned contrasts of the nonimproved group. For the improved group, there was a significant symptom elevation 3 months after the treatment as compared to the end of treatment (T3), \(F(1, 23) = 6.05, p < .05, \eta_p^2 = .21\). At the 6-month follow-up, this elevation was less clear and did not reach statistical significance \((p = .07)\). When comparing the follow-up time points to the beginning of treatment (T2), the participants had significantly fewer symptoms at 3-month, \(F(1, 23) = 4.72, p < .05, \eta_p^2 = .17\), and 6-month follow-ups, \(F(1, 23) = 6.72, p < .05, \eta_p^2 = .23\), than at T2.

Sum scores of the 16 ADHD-related items of SCL-90 (SCL-16) at each time point are presented for the improved and nonimproved groups in Figure 2. The results resemble those obtained with BADDS. The main effect of measurement time point, \(F(4, 92) = 4.27, p < .01, \eta_p^2 = .16\), and the interaction effect of measurement time point and group, \(F(4, 92) = 5.38, p = .001, \eta_p^2 = .19\), were significant. For the nonimproved group, there was no change of symptoms in the planned contrasts. Visually, there seemed to be an upward trend in the symptoms of the improved group during the follow-up. This, however, was not statistically significant because there was no difference in the planned contrasts during the follow-up (i.e., from T3 to T4 and from T3 to T5) and the group had significantly fewer symptoms at T4, \(F(1, 23) = 13.21, p = .001, \eta_p^2 = .37\), and T5, \(F(1, 23) = 6.74, p < .05, \eta_p^2 = .23\), than at the beginning of rehabilitation.

When comparing the absolute change of symptom scores from the beginning of treatment to the 6 month follow-up (i.e., from T2 to T5), it was found that the two groups differed from each other. At the end of the follow-up,
improved participants’ BADDs total scores had changed significantly more (mean reduction of 11.09 points as compared to the mean elevation of 1.86 points in the nonimproved group), verified with an independent samples t test, \( t(23) = -2.27, p < .05, \eta^2_p = .18 \). Changes of the SCL-16 score were to the same direction (mean reduction of 7.64 points in the improved group as compared to the mean elevation of 1.86 points in the nonimproved group). This, however, did not reach statistical significance despite of medium effect size (\( p = .08, \eta^2_p = .13 \)).

Other Psychiatric Symptoms During the Treatment and Follow-Up

On BDI-II, the main effect of time and the interaction effect of time and group did not reach significance (\( p = .18 \) and \( p = .11 \), respectively). In the planned contrasts of the improved group, there was a significant decrease in depressive symptoms from T2 to T3, \( F(1, 23) = 11.58, p < .01, \eta^2_p = .34 \). However, this did not endure through the follow-up time. Although there was no significant change from T3 to T4 or T5 (\( p = .07 \) and \( p = .58 \), respectively), symptoms were somewhat increased and did not remain significantly below the pretreatment level at T4 (\( p = .14 \)) and T5 (\( p = .06 \)). For the nonimproved group, no significant changes were found.

In SCL-90, there was no main effect of time (\( p = .13 \)), but there was a significant interaction effect of time and group, \( F(4, 92) = 5.74, p < .001, \eta^2_p = .20 \). In the improved group, total symptom score decreased significantly during the treatment, from T2 to T3, \( F(1, 23) = 17.88, p < .001, \eta^2_p = .44 \). During the follow-up, there was a symptom elevation from T3 to T5, \( F(1, 23) = 5.34, p < .05, \eta^2_p = .19 \). However, the symptoms remained below the pretreatment level both at T4, \( F(1, 23) = 5.26, p < .05, \eta^2_p = .19 \), and T5, \( F(1, 23) = 4.70, p < .05, \eta^2_p = .17 \). For the nonimproved group, no significant differences were found.

Self-Evaluated Change at the End of Follow-Up

When asked to compare their overall present situation at T5 to that of T2, none of the participants found it markedly worse. One (4%) found it to be somewhat worse, 6 (24%) similar, 13 (52%) somewhat better, and 5 (20%) markedly better. The improved and nonimproved groups did not differ in their judgments when analyzed with a \( \chi^2 \) test (\( p = .67 \)). In open-ended answers, there were several explanations for the self-perceived improvement, of which enhanced self-awareness, better compensatory strategies, and positive life changes (e.g., new social relationships, getting employed) were the most frequent.

Factors Related to Improvement in ADHD Symptoms

Of the 25 participants, 17 (68%) had ADHD medication and 8 (32%) were without medication at the beginning of rehabilitation. When investigating the improved and nonimproved groups separately, it was found that 8 participants (73%) of the improved group had medication whereas 3 participants (27%) did not. For the nonimproved group, the figures were 9 (64%) and 5 (36%) participants, respectively. The groups did not differ in the number of participants having medication, analyzed with a \( \chi^2 \) test (\( p = .65 \)).

In addition to the ADHD medication, there were several other factors that could have been related to amelioration: background variables (i.e., age, gender, education, T1 occupational status, childhood ADHD symptoms assessed at T1 with Wender Utah Rating Scale [Ward, Wender, & Reimherr, 1993]), severity of ADHD symptoms at the beginning of treatment (i.e., BADDs total score, SCL-16 score at T1 and T2), severity of other psychiatric symptoms at the beginning of treatment (i.e., BADDs total score, SCL-90 total score at T2), and variables related to treatment (i.e., rehabilitation group, psychologist leading the group). Factors and their possible associations with amelioration of symptoms (defined as individual percentages
of change or according to the improved–nonimproved group distinction) were analyzed using general linear models, logistic regression, $\chi^2$, and exploratory discriminant function analysis. Only one statistically significant factor, T1 occupational status, was found. All participants of the nonimproved group were involved in productive activity (i.e., employed or students), whereas the improved group had 4 (36%) participants leading a “nonproductive” life (i.e., unemployed, on sick leave, or retired), $\chi^2(1) = 6.06, p < .05$, contingency coefficient $= .44$.

When investigating the nonimproved group separately, it was found that 12 (86%) nonimproved participants had no change of symptoms during treatment (< 20% decrease and < 20% increase in average symptoms) and 2 (14%) had symptom elevation (≥ 20% increase in average symptoms).

**Discussion**

Participants having improvement in ADHD symptoms during group rehabilitation (i.e., 11 participants classified as “improved”) maintained most of their benefits through the 6-month follow-up. In the BADDS total score, there was some increase in symptoms, but this remained consistently below the pretreatment level. In SCL-16, symptoms remained at the same decreased level through the follow-up. In addition, participants who had not improved during rehabilitation (i.e., 14 participants classified as “nonimproved”) continued not to have any change during the follow-up either. Thus, there seemed to be at least some long-lasting benefit in the improved group.

These findings are in line with the previous results of Stevenson et al. (2002), where their group intervention resulted in 1-year lasting improvements in ADHD symptomatology and organizational skills of the participants. However, as in this study, they had no control group during the follow-up, and therefore more controlled studies are needed in the future to ensure the long-term effects. In addition, it is unclear whether the follow-up times used are sufficiently long. In this study, a longer follow-up would have probably been useful because there was some increase in symptoms of the improved group during the 6 months. In addition, many slower real-life changes (i.e., keeping a job, completing studies) could possibly be identified during longer follow-ups.

In addition to the ADHD symptoms, we investigated other psychiatric symptoms experienced by the participants through the study. In the beginning of the rehabilitation, there was no difference between the improved and nonimproved groups in the severity of BDI-II or SCL-90 symptoms. Later on, there was no change of symptoms in the nonimproved group. In the improved group, on the contrary, there was a significant decrease of psychiatric symptoms during the treatment on both measures that was also partly maintained during the follow-up. Thus, amelioration of ADHD symptoms seemed to be paralleled with a concurrent positive change in psychological well-being. This co-occurrence of symptom alleviation must be interpreted with caution, however. Measures of the ADHD symptoms and other psychiatric symptoms partly overlapped, especially in the case of SCL-90 sum score and SCL-16. In addition, no causal relationship can be inferred between the ADHD symptoms and other psychiatric symptoms, although it is reasonable to assume that these might affect each other.

Participants were also asked to compare their experienced overall situation at the 6-month follow-up to the pretreatment situation. As many as 18 of them (72%) considered it to be somewhat or markedly better. Most frequently, participants explained this improvement as deriving from enhanced self-awareness, better compensatory strategies, and/or positive life changes (e.g., getting employed, having new social relationships). All these can be perceived as either direct or indirect manifestations of treatment benefit. However, no statistically significant difference was found between the self-evaluations of improved and nonimproved participants. This could be because of several factors including a possible discrepancy between symptoms and real-life functioning (Gathje, Lewandowski, & Gordon, 2008; Gordon et al., 2006) or positive life changes not related to treatment. In addition, some participants may have been inclined to give answers that they assumed desirable instead of being entirely objective about their situation.

Of the 25 participants, 11 seemed to benefit from the treatment in terms of symptom amelioration. Possible reasons for not benefiting were discussed earlier to some extent (Virta et al., 2008). When trying to statistically identify factors related to benefiting from the treatment, only one was found. All participants of the nonimproved group were either working or studying at the beginning, whereas the improved group had 4 (36%) participants leading a more “nonproductive” life (i.e., unemployed, retired, or on sick leave). This difference might indicate, for example, that some members of the improved group had fewer everyday obligations and therefore more time to rehearse new skills introduced in the rehabilitation. It is also possible that the rehabilitation was more meaningful...
for the nonproductive participants because of their life situation. However, any interpretations should be made with caution because of the small sample size. Related to this, there are presumably other factors associated with benefits, but these effects were not large enough to be detected in this sample.

There are several significant limitations to the study, most important of which are sample issues. As already noted, the sample size was small, and this poses challenges to the interpretation of the results and diminishes the likelihood of detecting minor effects. Consequently, larger samples are needed in the future. In addition, in spite of rather permissive inclusion criteria, our recruitment and selection protocol (for details, see Virta et al., 2008) as such might have caused the most severely disabled ADHD adults to self-select out of the study. It is thus possible that ADHD adults with mild to moderate disturbances were more represented in the sample, restricting the generalizability of the results to the whole ADHD population.

Second, confounding factors of natural fluctuation, optimism, and demand characteristics were not sufficiently controlled for. We had no separate control group in the study, as discussed in detail earlier (Virta et al., 2008). Although partly circumvented by comparing the improved and nonimproved groups, this did not completely prevent interpretative problems. It can be, for example, questioned whether the two groups were similar in their susceptibility to demand characteristics. In addition, follow-up sessions and data collection were usually performed by the same psychologist who had conducted the group rehabilitation. This might have affected the answers of the participants even though the data collection was always conducted in the very beginning of the session, psychologists behaved in as neutral manner as possible, and there was no discussion on the results of the study until the very end of the last follow-up session. In future follow-up studies, more attention should be paid to these issues.

Third, most of our outcome measures were symptom based. More functional measures would be needed to determine treatment outcomes in adult ADHD. In addition, results reported in this study rely mostly on self-report questionnaires or other self-evaluations, which might introduce bias to the results. Therefore, additional objective measures of improvement should be employed in the future, as recently recommended (Weiss et al., 2008).

In conclusion, results of the 6-month follow-up further support the utility of the cognitive-behaviorally-oriented group rehabilitation in treating adult ADHD. There seemed to be long-term benefits, even though most of the participants already had stabilized medications before the rehabilitation. However, there is obviously a need for more well-controlled studies with larger samples and longer follow-ups to ensure the results.

References


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