



Cognitive-behavioral therapy for externalizing disorders: A meta-analysis of treatment effectiveness



Gemma Battagliese^{a, b, *}, Maria Caccetta^a, Olga Ines Luppino^a, Chiara Baglioni^{a, c},
Valentina Cardi^{a, d}, Francesco Mancini^a, Carlo Buonanno^a

^a Scuola di Psicoterapia Cognitiva S.r.l., Viale Castro Pretorio 116, 00185, Roma, Italy

^b Department of Psychology, Sapienza University of Rome, Via dei Marsi 78, 00185, Rome, Italy

^c Department of Psychiatry and Psychotherapy, Freiburg University Medical Center, Hauptstrasse 5, D-79104, Freiburg, Germany

^d Section of Eating Disorders, Psychological Medicine, Institute of Psychiatry, King's College London, London, UK

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ABSTRACT

Externalizing disorders are the most common and persistent forms of maladjustment in childhood. The aim of this study was to conduct a meta-analysis evaluating the effectiveness of Cognitive Behavioral Therapy (CBT) to reduce externalizing symptoms in two disorders: Attention Deficit Hyperactivity Disorder (ADHD) and Oppositional Defiant Disorder (ODD). The efficacy of CBT to improve social competence and positive parenting and reduce internalizing behaviors, parent stress and maternal depression was also explored. The database PsycInfo, PsycARTICLES, Medline and PubMed were searched to identify relevant studies. Twenty-one trials met the inclusion criteria.

Results showed that the biggest improvement, after CBT, was in ODD symptoms (−0.879) followed by parental stress (−0.607), externalizing symptoms (−0.52), parenting skills (−0.381), social competence (−0.390) and ADHD symptoms (−0.343). CBT was also associated with improved attention (−0.378), aggressive behaviors (−0.284), internalizing symptoms (−0.272) and maternal depressive symptoms (−0.231).

Overall, CBT is an effective treatment option for externalizing disorders and is also associated with reduced parental distress and maternal depressive symptoms. Multimodal treatments targeting both children and caregivers' symptoms (e.g. maternal depressive symptoms) appear important to produce sustained and generalized benefits.

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1. Introduction

The estimated prevalence of psychiatric disorders in youth ranges between 10% and 20% (Belfer, 2008; Jaffee, Harrington, Cohen, & Moffitt, 2005). Quality of life in children with mental health issues is poorer than quality of life in healthy children and children suffering from chronic physical illness (Bastiaansen, Koot, Ferdinand, & Verhulst, 2004; Sawyer et al., 2002). If not treated early and effectively, these conditions produce significant adverse outcomes in adulthood, including detrimental, longer-term effects on social relationships, health, and economic success (Karantanos, 2012; Loth, Drabick, Leibenluft, & Hulvershorn, 2014).

* Corresponding author. Scuola di Psicoterapia Cognitiva S.r.l., Viale Castro Pretorio 116, 00185, Roma, Italy.

E-mail address: gemma.battagliese@uniroma1.it (G. Battagliese).

Externalizing disorders are common disorders in children (American Psychiatric Association, 2000) and include the diagnoses of Attention Deficit Hyperactivity Disorder (ADHD), Conduct Disorder (CD) and Oppositional Defiant Disorder (ODD). The genetic risk for developing these conditions seems to be greater in the context of impaired parent–child relationships (Samek et al., 2014). After illness onset, externalizing symptoms continue disrupting interpersonal relationships. Parents can show controlling and punitive behaviors, are often less responsive to their children's needs (Hechtman et al., 2004) and can develop psychopathological symptoms themselves (Shin & Stein, 2008).

Results from a 24-year longitudinal study showed that externalizing symptoms in childhood predict disruptive behaviors in adulthood, as well as anxiety, mood and substance use disorders (Reef, Diamantopoulou, van Meurs, Verhulst, & van der Ende, 2011) and a recent meta-analysis found that externalizing disorders are associated with the later development of unipolar depression (Loth

et al., 2014). Due to the detrimental and long term effects of externalizing disorders on the individual and their families, timely and effective treatments appear to be crucial.

A range of psychological strategies are currently employed to target externalizing symptoms. Multimodal and extensive treatments are recommended, including psychoeducation, behavioral and cognitive behavioral therapy (CBT), interpersonal psychotherapy, family therapy, school-based interventions, social skills training and parent management training (PT), (Lochman, Powell, Boxmeyer, & Jimenez-Camargo, 2011; Masi et al., 2014; NICE, 2013). These treatments can involve individual and family psychotherapy, medication and sociotherapy (Steiner & Remsing, 2007). Cognitive and emotional strategies such as emotion awareness, perspective taking, anger management and problem solving are usually employed and homework are used to enhance motivation and generalization of skills to everyday life (Lochman et al., 2011).

Despite the large availability of data showing the efficacy of CBT techniques to reduce externalizing symptoms (Lochman et al., 2011; Steiner & Remsing, 2007), no quantitative syntheses of findings have been published so far. Thus, the aim of this paper was to conduct a meta-analysis of studies investigating the effectiveness of CBT in reducing externalizing symptoms in children and adolescents. Externalizing, ADHD and ODD symptoms were considered as primary outcomes. Secondary outcomes included social competence, internalizing behavior, parent stress, positive parenting and maternal depression.

2. Method

2.1. Search procedure

MC and OIL conducted the literature research independently and screened titles and abstracts to check studies' eligibility; GB and VC examined the full texts of the identified studies and extracted the data for descriptive and statistical purposes.

The electronic databases PUBMED, MEDLINE, PsycINFO and PsycArticles were searched to identify relevant research articles. Date limits were set from January 1980 (i.e. date of publication of the DSM III) to December 2012. The search terms used were: "Cognitive behavioral therapy" OR "CBT" linked to "externalizing" OR "ADHD" OR "ODD" OR "CD" OR "anger control" OR "anger management" OR "anger treatment".

The reference lists of the papers selected were inspected to identify further eligible studies. Data from unpublished studies were not included.

2.2. Selection criteria

Six inclusion criteria were used: 1) the study investigated the effects of CBT in externalizing disorders using a randomized controlled trial (RCT) design; 2) study participants were younger than 18 years old, 3) the treatment tested was cognitive or behavioral or cognitive-behavioral therapy; 4) the study included a control group (participants on a waiting list or a different treatment group); 5) the diagnostic criteria for an externalizing disorder (ADHD, ODD, CD) were met and 6) the outcome measures were evaluated pre- and post-treatment.

Data were obtained through clinical observations, interviews or questionnaires and reported by parents, teachers and children/adolescents.

2.3. Data extraction

Information about: (1) study's authors and year of publication);

(2) sample size and demographics (i.e. age, gender, nationality); (3) treatment target (i.e. parents, teachers, children or combined); (4) measures used; (5) participants reporting on outcome measures (i.e. mothers, fathers or both, teachers, children); (6) participants' diagnoses; (7) type of intervention used and control groups; (8) time of follow-up assessments, (9) study design and quality analysis. Means and standard deviations (SDs) of the outcome measures were also extracted. The primary outcome measures considered were: externalizing behaviors and ADHD and ODD symptoms measured using validated standardized questionnaires (see Table 1). Secondary outcomes were: attention, aggressive behavior, social competence, internalizing behavior, parent stress, positive parenting and maternal depression as measured through validated standardized questionnaires (see Table 1 for details).

Conduct disorder's symptoms were not included amongst the outcome measures as a sufficient number of studies to conduct the analyses were not available.

2.4. Meta-analysis

All meta-analytic computations were performed using the software Comprehensive Meta-analysis (version 2; Borenstein, Hedges, Higgins, & Rothstein, 2011). Pre- and post-treatment means and SDs were entered for each outcome measure and the pre-post change was calculated. A separate meta-analysis was performed for each outcome variable. Effect sizes were calculated (Cohen's *d*). Effect sizes ranging between 0.56 and 1.2 were considered large, effect sizes ranging between 0.33 and 0.55 were considered as moderate and effect sizes ranging from 0 to 0.32 were considered negligible (Lipsey & Wilson, 1993).

The treatment effect was considered to be significant (effect size of 0.5) when the mean of the trained group was half standard deviation larger than the mean of the control group. Final effect sizes ± 3 SDs above or below the weighted mean effect size estimate in each data set were identified as outliers and the corresponding studies were excluded from the analyses (Hedges, 1985).

A random effects model was used for the meta-analysis due to the differences identified between studies (Higgins, Thompson, Deeks, & Altman, 2003). The *Q*-statistic was calculated as indicator of homogeneity. A significant *Q* rejects the null hypothesis of homogeneity and indicates that the variability among the effect sizes is greater than what is likely to result from subject-level sampling error alone.

The I^2 -statistic was calculated as an indicator of heterogeneity in percentages. A value of 0% stands for a no observed heterogeneity and larger values indicate increasing heterogeneity (i.e. 25% considered as low, 50% as moderate and 75% as high heterogeneity).

Specific subgroup analyses were conducted to investigate the variability between studies. These analyses included the different diagnostic groups (ADHD, ODD, CD), responders (mother, father, both parents, teachers) and intervention targets (children, parents, teachers).

A meta-analytic calculation was conducted when at least three studies included the variables considered.

2.5. Assessment of quality

The methodological quality of the studies selected for the meta-analysis was assessed independently by the authors using the Critical Appraisal Skills Programme (CASP) for RCTs (Bradley & Hill, 2001). Data from the qualitative assessment are reported in a previous manuscript (Baglioni et al., 2009). Only studies that reached a cut-off quality score of 60% were included in the meta-analysis.

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