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Six-year outcome for children with ODD or CD treated with the coping power program

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ABSTRACT

Children with severe aggressive behavioral problems are one of the groups most frequently referred to mental health clinics, and they engage in behaviors that put them at risk for substance use problems and a host of other negative outcomes. The present study aimed to assess the long-term outcome (six-year follow up) of the Coping Power Program delivered in a mental health hospital for children with behavioral disorders. We recruited one hundred and twenty children (mean age = 9.9, SD = 0.85), twenty-three patients were lost during the follow-ups. The sample of the current study included sixty-seven youths with Oppositional Defiant Disorder, and thirty with Conduct Disorder. We used Child Behavior Check List, Inventory of Callous Unemotional traits and a youth survey to evaluate substance use. After the baseline evaluation they were allocated to Coping Power or to a generic multi-component treatment. Coping Power produced significant reduction in Callous Unemotional traits, relative to the control condition; Coping Power seems to be effective also in reducing the rate of substance use. However, no differences have been found in externalizing behavior reduction in the two groups. This study contributes to the successful dissemination of best-practice treatments in public mental health services for children.

1. Introduction

Aggressive behavioral problems in children have been found to increase risk for developing mental health problems, school dropout and substance abuse during adolescence (August et al., 1999; Lahey et al., 2002; Odgers et al., 2008).

When it comes to treatment of youths with aggressive behavioral problems, it is important to consider that they are an extremely heterogeneous group. Over recent years, researchers have focused their attention on a specific subgroup of children with behavioral problems characterized by the presence of elevated levels of Callous Unemotional (CU) traits (Frick et al., 2014). CU traits, whose main features are lack of empathy and guilt, shallow affects, and lack of concern about performance on tasks and others' feelings (American Psychiatric Association, 2013), are associated with more severe and persistent patterns of antisocial behaviors, delinquency, substance use, and a greater risk of maintaining disruptive behaviors (Fontaine et al., 2010; Muratori et al., 2016). Besides, youths showing severe aggressive behaviors with CU traits appear less responsive to some forms of traditional interventions for children with ODD or CD diagnosis (Hawes and Dadds, 2005), and a recent meta-analysis indicated that, currently, it is difficult to draw firm conclusions about treatment effects in reducing children's levels of CU traits (Wilkinson et al., 2016).

For instance, studies investigating treatment outcomes associated with CU traits suggested that parent training programs, which are one of the "gold-standard" interventions for children with aggressive behavioral problems, may promote to some extent a reduction of CU traits in youths, but results are often mixed (for a review see Hawes et al., 2014). This kind of interventions focuses mainly on implementing parenting skills, without addressing core deficits in emotional processing and empathy typical of children with high levels of CU traits, and this probably prevent them from obtaining more positive results. Indeed, most recently, novel interventions specifically addressed for children with behavioral problems in association with high levels of CU traits, are more focused on emotional and empathic skills, and have obtained promising results (see for instance, ERT, Dadds et al., 2012;

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CARES, Datyner et al., 2016).

At the same time, interventions for children with aggressive behavioral problems should be able to prevent and tackle the emergence of further negative outcomes, such as substance use during adolescence. Indeed, it has been estimated that up to 50% of adolescents with severe behavioral problems meet criteria for a substance use problem (Armstrong and Costello, 2002). The co-occurrence of a behavioral problem and substance use lead to an exacerbation of both disorders, and consequently to family dysfunction, physical health issues, poor educational outcomes, incarceration, and, globally, poorer quality of life and reduced life opportunities (Faggiano et al., 2008; King et al., 2000). Studies have also shown that youths with both a mental disorder and substance use disorder are less compliant to treatment and exhibited poorer short- and long-term outcomes (for a review see Couwenbergh et al., 2006).

In several studies intervention programs have been found to be effective in reducing behavioral problems in young children in a mid and short-term perspective (Battagliese et al., 2015; Eyberg et al., 2008). A prominent example is The Incredible Years (IY) program, which is a parent training model, and Drugli et al. (2010) indicated the maintenance of positive long-term results for young children treated with this parent training model. However, IY has been developed for younger children than children with whom our treatment model works. Overall, long-term outcome for school-aged children treated for their severe behavioral problems is very limited, and studies about the effects of interventions for ODD and CD on CU traits and substance use are still needed.

The Coping Power Program (CPP; Lochman and Wells, 2002) is a group-delivered intervention for at-risk children (8–12 years), based on cognitive behavioral principles and practices. The program provides children with a cognitive-behavioral therapy and their parent with a parent training intervention. It has proven to be effective in preventing delinquent behaviors and substance abuse in at-risk children (Lochman and Wells, 2002, 2003). The CPP has been adapted for children with Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD), and has been evaluated in outpatient mental health care located in Sweden and Netherland (Helander et al., 2018; van de Wiel et al., 2007).

In a long-term follow-up study (five-years after the end of the treatment) Zonnevylle-Bender et al. (2007) showed that the CPP reduces the rate of substance use in early adolescence in Dutch patients. Following the Dutch colleagues' experience, we adapted the CPP for everyday clinical practice with Italian ODD and CD children, treated in our outpatient mental health care unit, located in Pisa (Italy). In our previous studies, children with ODD and CD diagnoses were allocated to either the CPP or other active treatment model. These studies indicated that at post-intervention and at short-term follow-up (1 year), the CPP was effective in reducing aggressive behaviors and CU traits in ODD and CD children (Muratori et al., 2017a). With regard to Zonnevylle-Bender et al. (2007) study, the current study advances prior research on the efficacy of the CPP by establishing its long-term effects on Callous Unemotional (CU) traits. In relation to our previous study (Muratori et al., 2017a,b), in the present study we added the adolescence follow up evaluation point and we measured the CPP effects on substance use. Overall, the present study included four follow-ups, with the last performed 6 years after the start of treatment, and was designed to determine the long-term effects of the CPP on externalizing behavioral problems, CU traits, and rate of substance use.

2. Method

2.1. Participants

One hundred and twenty children (9–10 years old) were recruited in our psychiatric outpatient clinic (Pisa, Italy) during a time period of 3 years (October 2007/October 2010). The children were allowed to participate in the study when they met the inclusion criteria. They had to meet the criteria for Oppositional Defiant Disorder or Conduct Disorder in accordance with schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version, K-SADS PL (Kaufman et al., 1997), and their IQ had to be at least 85 (according to the Italian version of WISC III; Wechsler, 1991). The diagnostic rules of K-SADS prohibits the diagnosis of ODD when CD was present, while comorbidity with attention-deficit/hyperactivity disorder (ADHD) was allowed (Loeber et al., 2009). Twenty-three patients were lost in the follow-up (10 patients interrupted the treatment and 13 did not participate in the follow-up post treatment evaluations). Children with all evaluation points, were 90 boys (93%) and 7 girls (7%), 67 (69%) with ODD and 30 (31%) with CD, of whom 20 (21%) with comorbid ADHD. The comorbidity of ADHD was treated with psychostimulants in all ADHD patients, while 10 patients without ADHD took risperidone. As regards family socio-economic status (SES), assessed with the Hollingshead and Redlich scale (Hollingshead and Redlich, 1958), 32% of the families had low SES, and 50% had medium SES.

2.2. Procedure

The current study used a block sequential assignment procedure instead of a randomized design. If they fulfilled the inclusion criteria, they were allocated to either the CPP or the control condition (CC). This block sequential assignment process is based on two primary clinical issues. The CPP is a group setting intervention, so when a group was available, it was necessary to fill the group as rapidly as possible, in order to avoid having patients wait a long time to begin the treatment; secondly, the clinical service required that the patients had to be assigned to treatment as soon as possible after referral, and thus, if there were no spots available in CPP, the patients had to be referred to other intervention, i.e. the control condition of our study. No other clinical criteria were used for group assignment. All the treatments lasted 12 months. The participants were 9–10 years of age at the beginning of the study, and were followed-up until the age of 15–16 years, using parent and child measures. Data were collected at Time 1 (before treatment), Time 2 (at the end of the treatment), Time 3 (12 months after the end of the, and Time 4 (six years after the start of treatment). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Written consent was obtained from parents at initial enrollment and at each of the following assessment points. The Ethical Committee of our Hospital approved the study.

2.3. Interventions

The CPP program was developed using a contextual social–cognitive model as a conceptual framework for identifying intervention objectives (Lochman and Wells, 2002). Even though the CPP started out as a prevention model dedicated to at-risk children, it has been introduced in the clinical setting as an intervention for children with ODD or CD diagnosis. The clinical version of the CPP shares the core features of the original one. Anyway, in order to tackle children's attention deficit, the clinical version relies mainly on activities rather that brainstorming. Besides, while the original version of the CPP includes 36 group sessions carried out with up to 8 children, the clinical one provides for 24 sessions with smaller groups (usually 5 children), which last about an hour and a half . The parent sessions were reduced to 16 sessions (instead of 18). In detail, the CPP—child component focused on: (a) children's long-term and short-term goals; (b) academic and study skills; (c) identification of different emotions and the physiological and cognitive aspects of those emotions, especially anger; (d) coping with anger arousal (using self-statements, distractions and relaxation); (e) improving perspective taking abilities and attribution re-training; (f) social problem solving training; (g) coping with peer pressure and

involvement in less deviant peer groups. The CPP-parent component modules focused on: (a) increasing positive parental attention and rewarding appropriate child behaviors, (b) ignoring minor disruptive behaviors, (c) giving effective instructions and establishing age-appropriate rules and expectations for their children at home, (d) applying effective consequences to negative child behaviors, (e) improving family communication and (f) reducing their own level of stress. Detailed manuals were used for both the child and parent components. The average child and parent attendance rate in the CPP sample was 86%. In the control condition, we included subjects who received a generic multi-component treatment model that uses cognitive behavioral principles and practices. The treatment is organized in weekly sessions, and it includes individual psychotherapy for children and individual parent training. The average child and parent attendance rate in the control condition sample was 83%. The adherence to protocol was checked for both intervention models (see Muratori et al., 2017a). The year before our last assessment, 11 (20%) of the CPP and 9 (21%) of the control condition group received psychotherapy intervention. At the same assessment point, 8 (15%) of the CPP group and 7 (15%) of the control condition group were receiving medications.

2.4. Measures

2.4.1. Children's diagnosis

The Schedule for Affective Disorders and Schizophrenia for School-Age Children-Present and Lifetime Version (Kaufman et al., 1997) was used to assess the children for DSM-IV disorders. Clinicians conducting the K-SADS interviews underwent training and satisfied reliability criteria (k Cohen ≥ 0.80). Both parents and children participating in the study completed the K-SADS interview independently. The rate of child-parent K-SADS diagnosis agreement was 0.87 (k Cohen).

2.4.2. Externalizing problems

The Child Behavior Checklist (CBCL; Achenbach and Rescorla, 2004) is a 118 item standardized behavioral checklist, completed by parents to record behavioral problems and skills in children from 6 to 18 years of age. Mothers completed the CBCL. In the current study, we reported the externalizing domains score. A number of studies have demonstrated convergence between the statistically derived syndromes of the CBCL and DSM-IV disorders (American Psychiatric Association, 2000; Edelbrock and Costello, 1988; Kazdin and Heidish, 1984) and CBCL syndromes display good diagnostic efficiency for assessing common externalizing disorders in children (Hudziak et al., 2004). The internal reliability of the total CBCL-externalizing score in the current sample was 0.84 (mean Cronbach α across time).

2.4.3. Callous unemotional traits

We administered to patients the self-reported version of the Inventory of Callous Unemotional (ICU) traits (Frick, 2003). The total score of ICU was used to evaluate CU traits in patients across time in the current sample. The internal reliability of the total CU scale in the current sample was 0.74 (mean Cronbach α across time).

2.4.4. Substance use

We administered to the patients at their last follow-up the CSAP Youth Survey. It is a self-reported 26-item questionnaire adapted from the California Student Survey (Pentz et al., 1989), and it measures child attitudes toward and their use of cigarettes, alcohol, and marijuana. It has a multiple choice ranking-answer possibility. In this study, only the use items were considered. The scores on these items were dichotomized to “users” or “not users”. The CSAP Youth Survey has been found to be in good agreement with biological measures of drug use (Pentz et al., 1989) and to be validly related to expected risk factors (Sale et al., 2003).

2.5. Data analysis

Hypotheses were tested in SPSS with linear mixed-effects models (MIXED) with full-information maximum likelihood (FIML) estimation (West, 2009). The analysis featured a three-level (measurement occasion within individuals within treatment groups) random-intercept model, to account for within-subjects correlations, within-class (CPP group) correlations, and within-treatment group correlations.

Analyses tested whether CPP affected significantly the change across time of the outcomes, controlling for the pharmacological treatment and the levels of socio-economic condition. The fixed-effect portion of the model treated outcomes as a function of time, experimental group condition (CPP and control), and time interacting with group. The random-intercept effect portion of the model considers the random effects of subjects and treatment group at the baseline level. Given the complexity of the model and the low number of subjects included we decided to not include the random -slope effect of subjects.

The Cohen's d effect size of pre-post change in the treatment group and in the control group were calculated as standardized effect size in a mixed/multilevel model, where standard deviations were derived from the standard errors of the estimated marginal means (Hedges, 2007). All analyses were conducted within SPSS 25 with the significance level set at 0.05.

3. Results

Preliminary analyses showed that there were no differences between the two groups on socio-demographic and clinical variables at the baseline evaluation (see Table 1). Attrition analysis showed no significant differences in age, gender, diagnosis ratio (ODD or CD) and clinical variables between those who dropped out and those who completed the study. Table 2 shows ICU and CBCL externalizing problems scores at each time points. Table 3 shows findings from the Mixed models where the longitudinal trend of externalizing and CU measures was regressed into experimental condition, controlling for stimulant treatment and the random effect of individuals and groups treatment. As we can see, significant interaction of CPP/control condition by time was found only for CU measure, but not for externalizing symptoms (see Table 2). For both outcomes, drug treatment resulted significant. Post hoc analyses conducted with ICU scores showed that in both groups, CPP and control condition, the decrease across time resulted significant, but higher in the CPP group (respectively control condition: B = 3.19; ES = 0.91; Cohen's d = 0.44; CPP: B = 6.82; ES = 0.68; Cohen's

Table 1
Baseline differences between samples on socio-demographic and clinical variables.

	Coping power program (N = 55)	Control condition (N = 42)	F	p
Age, y	9.7 (0.80)	9.9 (0.90)	1.29	NS
EXT CBCL	70.13 (4.52)	69.88 (6.18)	0.05	NS
ICU Y	27.98 (4.67)	28.57 (7.70)	0.22	NS
Gender, N			χ^2	p
Male	52	38	0.18	NS
Female	3	4		
Family composition, N				
Two parents	29	42	0.65	NS
One parent	13	13		
Diagnosis, N				
ODD	38	29	0.01	NS
CD	17	13		
ADHD comorbidity	12	8	1.70	NS
Medication, N	13	17	3.16	NS

EXT CBCL, Child Behavior Checklist Externalizing Problems; ICU Y, Inventory of Callous-Unemotional Traits Youth Report; ODD, Oppositional Defiant Disorder; CD, Conduct Disorder; ADHD, Attention Deficit Hyperactivity Disorder.

Table 2
Callous Unemotional traits and externalizing problems scores at each time points.

		Coping power program	Control condition
Child behavior checklist externalizing problems			
	T1	70.13 (4.52)	69.88 (6.18)
	T2	64.62 (6.58)	67.61 (6.33)
	T3	60.71 (7.23)	64.29 (9.14)
	T4	60.29 (5.58)	62.17 (8.47)
Inventory of callous-unemotional traits youth report			
	T1	27.98 (4.67)	28.57 (7.70)
	T2	24.04 (5.25)	25.82 (7.72)
	T3	21.46 (5.64)	23.80 (8.02)
	T4	21.59 (6.31)	25.31 (6.10)

Table 3
Mixed Model predicting change in externalizing and Callous Unemotional measures.

	Externalizing		Callous unemotional	
	B (SE)	*P*	*B (SE)*	*P*
Intercept	**54.47 (1.58)**	**0.000**	**17.78 (1.66)**	**0.000**
Time	**9.89 (0.95)**	**0.000**	**6.79 (0.741)**	**0.000**
Drug treatment	**4.64 (1.08)**	**0.000**	**2.76 (1.17)**	**0.020**
Socioeconomic status	**2.67 (1.12)**	**0.047**	.678 (1.22)	0.578
Experimental group	.748 (1.33)	0.575	**3.72 (1.29)**	**0.004**
Time BY Experimental group	−1.75 (1.42)	0.200	**−3.61 (1.11)**	**0.001**
Subjects: Random intercept	**16.96 (3.31)**	**0.000**	**23.96 (6.93)**	**0.000**
Treatment groups: Random intercept	**0.00 (0.000)**	**–**	**0.00 (0.000)**	**–**

Note. Statistically significant results ($p < 0.05$) from the deviance tests for the fixed effects and from the Wald tests for the random effects are in boldface.

Table 4
Substance use of patients in adolescence.

N	Coping power program	Control condition	χ^2
Cigarette	20	18	0.42
Marijuana	9	16	4.81[a]
Alcohol	15	12	0.02

[a] $p < 0.01$.

$d = 1.25$). In relation to the substance use, at the follow- up assessment, 16% of the CPP patients, and 38% of the control condition patients were marijuana users ($\chi 2 = 4.81$, $p < 0.01$), see Table 4.

4. Discussion

A recent review (Bevilacqua et al., 2017) showed that aggressive behavioral problems are related to a significant high risk of poor outcomes, such as cannabis use, alcohol use, aggression, antisocial behavior, and poor education. Early intervention is recommended across domains to maximize likelihood on several psychosocial outcomes. Furthermore, treating substance use is quite challenging and clinical effects are not always reached, thus the possibility to prevent is extremely relevant (Whitmore et al., 2000). Given that, we aimed to assess whether the CPP intervention would decrease externalizing behavioral problems, CU traits, and substance use in children with ODD or CD in long term. More generally, we aimed to test whether a manualized, evidence-based treatment model should be implemented in a public mental health care unit. Six years after the start of treatment, our findings suggest that the CPP produced significant reduction in CU traits, relative to the active control condition; and the CPP seems to be effective also in reducing the rate of substance use. However, no differences have been found in externalizing behavior reduction in the two groups. It is not unexpected that both treatment models produced similar effects on patients' externalizing behaviors. Indeed, the control condition involved multi-component treatment model that uses cognitive behavioral practices, which is considered an effective approach to reduce aggressive behaviors in youths (Battagliese et al., 2015). However, the current findings indicated that CPP is able to reduce CU traits in children with severe aggressive behavioral problems, more than a generic multi-component treatment model. Importantly these findings are similar to those reported in at-risk children samples by Lochman et al. (2014). In the current study, we noted a reduction in CU traits only in patients who took part in a group therapy. Literature has strongly associated CU traits in children with serious behavioral problems with impairments in the moral development (Frick et al., 2014). Thus, we reckon that being part of a group may help children sharing their feeling with each other and developing a deeper awareness of peer's emotions. This in turn, appears to strengthen their moral emotions. Importantly, previous studies have shown the long-term efficacy of different intervention models in reducing aggressive behavioral problems in youths (see for instance, Drugli et al., 2010; Zonnevylle-Bender et al., 2007), but they usually did not include levels of CU traits as an outcome measure.

It is important to note that more adolescents in the CPP had never used marijuana compared with adolescents in the control group. This, together with the effects on Callous Unemotional traits, represents a relevant aspect in terms of prevention.

The lack of a completely random assignment of subjects could have introduced bias into patient allocation; furthermore, the current findings need to be interpreted with caution, because our ratings are provided by subjects who received the treatments, and thus may be biased in favor of reporting positive changes. Furthermore, children's behavioral problems in school were not addressed, although a questionnaire completed by a different teacher a year later (as usual in Italian school context) may not be very sensitive; adding a classroom management intervention element for teachers could improve outcomes.

However, our findings have important clinical and policy implications. The CPP with ODD or CD diagnosed school children may be a preventive tool for poor outcomes and substance use later in adolescence, benefiting both the individual and society. Our findings are similar to those of Dutch colleagues (Zonnevylle-Bender et al., 2007), both these findings indicate that manualized behavior therapy for ODD and CD in middle childhood seems to be more powerful than a generic intervention in reducing substance use in early adolescence. The CPP was intended to be sustainable under everyday conditions of mental health services located in Netherlands, Sweden and Italy; therefore, all these studies contribute to the successful dissemination of best-practice treatments in public mental health services for children (Weersing et al., 2009). Working with children in groups is less costly than individually-delivered intervention; and CPP could be considered more cost-effective than different treatment models because the CPP group setting model can treat more children simultaneously. More general, group reward systems and peer reinforcement play an important role in assisting children to attain intervention related goals and thus to generalize behavioral improvements resulting from intervention to children's real word settings due to the fact that the group format permits children to practice learned skills with other peers. In this respect, we'd like to point out that the CPP is now implemented in several Italian community hospitals (Muratori et al., 2017b), so future studies will determine whether this treatment program could be scaled up.

Conflict of interest

John E. Lochman is the co-developer of the Coping Power program and receives royalties from the Oxford University Press for the Coping

Power Implementation Guides for the Child Group Program and the Parent Group Program. He is also the PI on grants from NICHD and NIDA, which provide funding for intervention, research on the Coping Power program. None of the other authors has conflicts of interest to declare.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Written consent was obtained from parents at initial enrollment and at each of the following assessment points.

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.psychres.2018.12.018.

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