



Decreasing Youth Hyperactivity and Inattention Problems Through Mentoring: Evaluation of the Mentor-UP Program

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Few studies so far have analysed the potential role of mentoring in decreasing hyperactivity and inattention problems. The aim of the current study is to investigate the impact of the Italian Mentor-UP mentoring program on hyperactivity and inattention problems in a non-clinical sample of mentees. "Mentor-UP" is a weekly school- and community-based mentoring program implemented in northern Italy over a period of 8 months. The sample included 468 students, 65 from the experimental group (mentees) and 403 as comparison group. Participants' age ranged between 8 and 14 years ($M = 11.31$, $SD = 1.40$), 46% were females and 20% were non-Italian youths. Students reported their levels of hyperactivity and inattention problems at the beginning and at the end of the program. A significant interaction between time and group revealed a significant effect of the program on hyperactivity and inattention problems ($B = -0.10$, $t(450) = -2.00$, $p = 0.04$), which decreased in mentees (Cohen's $d = -0.21$) but not in the comparison group. Results supported the effectiveness of Mentor-UP in decreasing youths' hyperactivity and inattention. This might be due to the structural characteristics of the mentoring relationships established in the context of Mentor-UP.

Keywords: youth mentoring, hyperactivity, inattention, prevention programs, service learning

HIGHLIGHTS

- Hyperactivity and inattention problems are frequent among youths
- Interventions for children with ADHD are well-established
- Less is known about prevention intervention for non-clinical children
- Mentoring might be effective in decreasing hyperactivity and inattention problems

INTRODUCTION

Youth mentoring has been proven as an effective strategy to foster positive development in childhood and adolescence (Dubois et al., 2011). The establishment of a positive relationship between a *mentee* (i.e., an at-risk youth) and a *mentor* (i.e., a volunteer outside the family) is considered a key factor for increasing mentees' well-being and fostering positive development (DuBois et al., 2011; Raposa et al., 2019). In the last decade, an increasing number of mentoring programs have been implemented and evaluated showing small but promising positive outcomes in mentees in terms of increased social and

emotional functioning (La Valle, 2015; Raposa et al., 2019). Along with positive development, youth mentoring can play a significant role in preventing and diminishing negative adolescent outcomes, such as alcohol and substance use, antisocial behaviors, delinquency (Tolan et al., 2008), and school dropout (Clarke, 2009). That is, both internalizing and externalizing problems can be effectively addressed through mentoring (e.g., La Valle, 2015). Hyperactivity and inattention problems have been included in the most frequent problems that cause school and social maladjustment and poor subjective well-being in children and young adolescents (e.g., Kawabata et al., 2012). However, only few studies so far have analysed the potential role of mentoring in this context (e.g., Evans et al., 2016). Therefore, the aim of the current study is to investigate the impact of the Italian Mentor-UP mentoring program (Marino et al., 2020) on hyperactivity and inattention problems.

Hyperactivity and Inattention Problems in Youths

Problems of hyperactivity and inattention are considered among the most common mental and behavioral health problems experienced by youths (Basch, 2011; Galéra et al., 2009). Hyperactivity represents a state of being unusually or abnormally active (Cretu, 2018), and its symptoms consist, among others, of excessive motor activity, talking excessively, acting as if “driven by a motor”, difficulties in waiting one’s own turn, and interrupting or intruding on others (e.g., Meinzer et al., 2018). Inattention is a state characterized by a lack of focused attention or a reduced attention span (Nigg et al., 2002). Inattentive symptoms include difficulties in (i) paying attention to details, (ii) remaining focused during tasks or play activities, (iii) following through on instructions, (iv) organizing activities, (v) avoiding tasks requiring sustained mental effort, (vi) losing or forgetting things necessary for activities, and (vii) being easily distracted, as reported by the Diagnostic and Statistical Manual of Mental Disorders-5 (American Psychiatric Association, 2013). Beyond the percentage (ranging from 2 to 7%) of children diagnosed with attention-deficit hyperactivity disorder (ADHD), systematic reviews indicate that a further percentage (around 5% or more) of children do not meet all the diagnostic criteria for ADHD but are likely to report substantial difficulties due to impulsivity, inattention, and excessive motor activity (Sayal et al., 2018). In this view, recent studies (e.g., Rowland et al., 2015), combining teachers and parents reports using DSM-IV symptom questions for ADHD, have reported that the prevalence of hyperactivity and inattention behaviors tends to be high also in population-based samples of school-aged children, indicating the importance of addressing these problems also in non-clinical samples, thus adopting a preventive approach and decreasing the likelihood that symptoms interfere with or reduce the quality of children’s social and academic functioning. The importance of considering the concept of subclinical or sub-threshold levels of ADHD has already been shown for a long time (Kóbor et al., 2012). Different approaches could be considered to identify children with subclinical ADHD (i.e., basing on cut-off scores and

percentiles, identifying subgroups through the latent class analysis) (see Kobor et al., 2012 for a more detailed description of these approaches). Despite these different approaches, researchers seem to agree that children and youths with subclinical levels of ADHD can present similar impairments experienced in children with a clinical diagnosis of ADHD (Cameron, 2017; Murphy and Barkley, 1996). It is well-established that youths with hyperactivity and inattention problems experience functional impairments at school, home, and in other social context (Basch, 2011). Specifically, several studies highlighted the association between these difficulties and a range of adverse psychosocial outcomes through the lifespan, including deficits in academic skills and performance (DuPaul, 2007), increased rates of grade retention and failure to graduate from secondary school (Galéra et al., 2009), peer-rejection and poor social skills (Mikami, 2010; Andrade and Tannock, 2014), antisocial behaviors and substance use (Spencer et al., 2007), and an overall low level of quality of life (Klassen et al., 2004). Authors suggested that because of social exclusion, children with subclinical ADHD symptoms may not be exposed to adequate social experiences and positive peer interactions with consequent impoverished social experiences and poor prosocial skills (Andrade and Tannock, 2014). Given the wide range of impairments and their consequently negative long-term effects, early psychosocial interventions might be crucial in decreasing the problems of hyperactivity and inattention and, in turn, fostering youths’ positive development (Schottelkorb and Ray, 2009). Enhancing the attention given to the subclinical forms of ADHD may be crucial for preventive strategies (Kóbor et al., 2012). The provision of instructional programs helping children develop appropriate social behaviour and problem-solving skills can be beneficial for children with any level of symptom severity, facilitating self-regulation abilities and reducing externalizing problems (Andrade and Tannock, 2014).

Treatments for Hyperactivity and Inattention

Evidence-based psychosocial treatments for hyperactivity and inattention generally begin during the first school years (Sonuga-Barke et al., 2011) and generally include behavioral and training interventions (Evans et al., 2014). Behavioral interventions typically consist in parent training, classroom management and peer interventions, aiming at modifying the antecedents and consequences of inattentive and hyperactive behavior, providing contingencies in the different child’s environments (Meinzer et al., 2018). Differently, training interventions (e.g., organizational skills training) aim to change children’ behaviour by enhancing their skill set (by focusing on skills that have been shown to reduce hyperactivity and inattention, such as emotional and behavioral regulation, peer conflict resolution strategies and perspective taking). The goal of these interventions is to achieve the behavioral change through the generalization of the enhanced skills or through training using reinforcement and punishment that may occur within children’s daily life (Meinzer et al., 2018). According to a systematic review on

this topic (Evans et al., 2014), both behavioral interventions and organizational skills training meet the criteria for valid treatments.

Youth Mentoring: A Viable Tool to Tackle Hyperactivity and Inattention Problems

Among the available interventions for children with hyperactivity and inattention problems, psychosocial programs not provided in clinical settings, such as school-based programs, might be potentially beneficial for this target population (for a review see Sibley et al., 2014). However, only few studies so far have shown the effectiveness of these school-based programs (Evans et al., 2007; Evans et al., 2016; Moore et al., 2019). Moreover, some concerns have been raised about the feasibility of intensive afterschool interventions, in which students are required to stay after school for several days per week for the entire school year, thus constituting a challenge for families and youth. Eminent researchers in the field (i.e., Evans et al., 2016) have suggested that mentoring models might be of value in this context as they are less expensive and less intensive and increase the likelihood that children stay engaged in the intervention for the entire duration of the academic year.

Nevertheless, to our knowledge, few programs used a “mentoring-type” relationship (DuBois et al., 2018; Munson and Railey, 2016, p. 6) to lessen problems associated with hyperactivity and inattention, especially among children and adolescents (e.g., Evans et al., 2007). For example, Anastopoulos and King (2015) have shown that a mixed approach (combining cognitive-behavioral therapy groups and mentoring sessions) was successful in decreasing ADHD symptoms of college students and increasing their executive functioning and emotional well-being as well as access to campus resources. With regard to younger people, it has been shown that “reading mentoring” (in which mentor and mentee are supposed to read a book together) may play a role in diminishing ADHD symptoms among elementary school students (Ray et al., 2007). For adolescents with ADHD attending middle school, Evans and others (2007, 2014, 2016) have repeatedly demonstrated the effectiveness of different versions of the Challenging Horizons Program (CHP), a broad school-based training intervention focused on academic and social difficulties. In the CHP–after school version (CHP-AS), intervention activities comprise organization of school material and assignments, study skills and interpersonal skill groups, aimed at improving relationships with peers and adults. The CHP-AS is provided two to three times per week for about 2 h per day. In the mentoring version (CHP-M), a subset of organizational interventions is provided within the context of a mentoring relationship, in which a mentor (a school staff member) and a mentee (the young adolescent with ADHD) meet on a weekly basis for about 2 h. The CHP was found to be effective in decreasing homework problems and inattention, in increasing organization and time management as reported by children’s parents, and in mildly improving academic functioning, with greater benefit of CHP-AS over CHP-M (Evans et al., 2016). Nevertheless, CHP-M has demonstrated

to provide significant gains for adolescents after 2 years of intervention in several behavioural and relational outcomes (Evans et al., 2007). Other positive aspects of the CHP-M include that the mentoring model is more feasible and less expensive than the CHP-AS and the students involved are less likely to drop out the program (being less demanding in terms of time and family efforts; Evans et al., 2016). Evans and others (2016) acknowledged that the after school version of the CHP is more effective than the mentoring version to treat ADHD, but argued that it is important to further explore individual differences in the effectiveness of the mentoring model as it might be more effective for less impaired young adolescents with ADHD.

To sum up, mentoring programs have shown some benefits for the treatment of hyperactivity and inattention problems (see Evans et al., 2007). However, there is still a lack of research about the potential role of mentoring programs targeting children with some problems of hyperactivity and inattention but do not receive a diagnosis of ADHD. Specifically, whereas the extant research has been focusing on children with ADHD, less is known about the effects of mentoring programs for children without diagnosis of ADHD but experiencing some distress associated to hyperactivity and inattention. Considering the developmental risks for children with problems of hyperactivity and inattention and the lack of sustainable effective interventions in non-clinical settings, further studies in this direction are certainly needed. Moreover, given that mentoring programs are generally more feasible and less expensive than intensive and specific treatments, those types of preventive interventions might be particularly helpful, for example, for schools and families with limited resources and access to specialized services. Therefore, it is important to test the effectiveness of mentoring programs as selective preventive strategies targeting at-risk youth.

Mentor-UP Program

Mentor-UP (i.e., Mentor-University of [Padova for peer review]) has been implemented for the last 12 years by the community psychology-based “[LINK Laboratory for peer review]” laboratory, at the University of [Padova for peer review]. The main aim of Mentor-UP is to increase mentees’ well-being, adjustment at school and connection to the local community by developing a positive relationship between mentors and mentees. In Mentor-UP program, mentors are trained university students paired with mentees who are at-risk youths. Mentors are selected at the beginning of each academic year through a motivational interview aimed at collecting information about individual characteristics (e.g., motivation and interests) to be used for matching the mentor with the most “akin” mentee (in terms of gender and shared interests). The vast majority of mentors are university students (age range 20–30 years) from the School of Psychology (both bachelor and master students), whereas about 5% of mentors each year study in other Schools (e.g., Liberal Arts, Law, and Social Science). Moreover, mentors are mostly volunteers, but a few of them (about 3%) may participate also as interns (gaining academic credits). In line with the best practices for mentoring

programs (DuBois, 2002; Randolph and Johnson, 2008), at the beginning of the academic year, mentors attend a training held by program staff, made of psychologists and professors. The aim of the training is to learn about their role as mentors, discuss potential difficulties in establishing and maintaining the relationship with the mentees, and how to handle possible problematic situations with the mentees and their families. The training comprises 6 h of lessons and 6 h for practicing communication and relational strategies through role playing and simulations. Lessons are about the meaning of mentoring relationships, international evidence-based interventions and their effectiveness, the role and duties of a mentor, child development tasks and difficulties, peer relationships, family conflicts, multicultural society, organizational rules. This knowledge helps mentors to understand their role and the specific context of at-risk youths' lives. Experiential lessons include how to establish a relationship with a child, assertiveness, active listening exercises, non-violent conflict resolution, negotiation, emotion regulation strategies in social context. As an example, mentors are asked to take part to simulations of conflict resolution at school (e.g., fighting because of racial issues) using efficacious communication and emotion regulation strategies. These skills are particularly useful for mentors to manage potential relational problems with mentees, their peers and schools.

After being matched by the *équipe* of the program, mentor-mentee pairs meet once a week for 2 hours (at the same time of the same weekday) for the entire duration of the program (from November to June following the school year). Mentor-UP is a mixed school- and community-based mentoring program: mentor-mentee pairs can meet either at school and/or around the city. In this program, schools play a crucial role in the program as they provide a potential setting for the meetings: overall, pairs usually spend 10–12 h in school-based activities during the program (e.g., homework organization, doing sports and playing in schools' facilities). Moreover, teachers are directly involved in the selection of mentees (see paragraph "Participants and Procedure") and they periodically meet mentors and the members of the program *équipe* in order to monitor the development of the mentoring relationship in which their students are involved. However, mentor-mentee pairs usually dedicate the remaining hours of the program (approximately 40–42 h) to extracurricular activities in the community (e.g., visiting museums and exhibitions, going to the cinema, discovering the neighborhood where mentees live, visiting the city center). Pairs choose the weekly activity together mostly based on the mentees' interests and needs. Pairs can decide to plan the activity with other pairs, in order to enhance youths' social skills.

The members of the *équipe* constantly monitor the evolution of each relationship through group meetings: every 3 weeks, mentors take part to a group meeting facilitated by the program staff, with an average duration of 2 h. During the meeting, each mentor is allowed to share with other mentors both positive and negative aspects of the on-going relationship with the mentee as well as potential problems, thus finding suggestions and support.

The focus of Mentor-UP on developing social competences (through mentor-mentee relationship), exploring the community to promote cultural and cognitive stimuli and increasing organization and time management in school activities, makes the program particularly suitable for decreasing hyperactivity and inattention problems in children and preadolescents.

Current Study

In this study, we examined mentees participating in the Italian Mentor-UP mentoring program. In this preventive program, trained university students serve as mentors for primary and middle school youths (mentees) identified by teachers as students who are currently experiencing personal, social, and academic challenges. Mentor-UP is not designed to exclusively address hyperactivity and inattention, but mentors are encouraged to adopt a child-centered style and help mentees with their behavioral and social difficulties (e.g., impulsivity, conduct and school problems, conflicts with peers and social rejection) by establishing a positive relationship with them (Strapp et al., 2014; Morrow and Styles, 1995), that is, a relationship characterized by pleasant but organized meetings. Mentor-UP is built upon the international best practices for mentoring programs (e.g., mentor recruitment, training, and continued staff support; DuBois, 2002; Randolph and Johnson, 2008).

Our research question is the following: Do hyperactivity and inattention levels decrease in mentees as compared to a comparison group at the end of the program?

The hypothesized theory of change is the "model of youth mentoring" (Rhodes, 2005), that posits "close, enduring mentoring relationships influence youth outcomes through social/emotional, cognitive, and identity development" (p. 265). In line with previous findings (e.g., Evans et al., 2014), it was hypothesized that mentees involved in Mentor-UP would report a significant decrease in hyperactivity and inattention at the end of the program in comparison to their classmates not involved in the program.

METHODS

Participants and Procedures

In the 2016/2017 academic year at-risk primary and middle school student mentees ($N = 65$) attending 6th, 7th, and 8th grade have been selected from nine public primary and middle schools in the city of Padova, a medium-size city located in Northern Italy. All 65 mentees were identified and recruited by schoolteachers and administrators of the local schools. Teachers recommended students for the program if at least two of the following criteria (which have consistently been identified in the literature as risk factors/correlates for the development of a wide range of psychosocial symptoms) were met: having behavioral, school and peer problems, low socioeconomic status, immigrant status, lack of parenting, coming from a single-parent family, few social stimuli, low motivation and self-esteem, and isolation. Exclusion criteria were: presence of diagnosed psychological or behavioral disorders for which children needed professional help (i.e., any type of disorder, including ADHD), and presence of

TABLE 1 | Sociodemographic information and descriptive statistics of the variables of interest.

	Mentee group (N = 65)		Comparison group of classmates (N = 403)	
Age (M(SD))	11.55 (1.32)		11.27 (1.40)	
Gender (% Female)	38.5		46.8	
First language (% Italian)	52.3		70.7	
Country of birth (% Italy)	60.0		91.3	
Single-parent family (%)	9.2		4.7	
Not living with parents (%)	3.1		0	
Mother working (% Yes)	76.9		81.3	
Father working (% Yes)	79.7		88.8	
	T1	T2	T1	T2
Hyperactivity/inattention M (SD)	1.77 (0.41)	1.69 (0.42)	1.64 (0.41)	1.65 (0.43)

learning disabilities (dyslexia, dysgraphia, dysorthography, dyscalculia) for which students followed specialized education plans.

Mentees' classmates (N = 403) participated in the study as comparison group. The final sample included 468 participants, 65 in the mentees group and 403 in the comparison group. Overall, the age of the sample ranged between 8 and 14 years old (M = 11.31, SD = 1.40), 46% were females, and 20% were non-Italian youths. The two groups were comparable in terms of gender distribution [$\chi^2(1) = 1.56, p = 0.21$] and age [$t_{(465)} = -1.53, p = 0.126$]. The two groups differ in immigrant status [$\chi^2(1) = 20.97, p < 0.01$] as "immigrant status" (first generation immigrants) was one of the inclusion criteria for the mentees group. Moreover, six mentees and nineteen classmates lived in single-parent families and two mentees (and none of the classmates) did not live with parents (they lived in juvenile educational communities), while the remaining lived in a two-parent family. Due to the small number of participants with no parents, parental status was recoded as (0 = two-parent family; 1 = single-parent family or no parents). The two groups differ in parental status [$\chi^2(1) = 5.94, p < 0.05$].

Measures

Participants (mentees and classmates) completed a questionnaire assessing sociodemographic information and hyperactivity/inattention behavior. Information about gender, age, country of birth, first language, parents' work status, and parental status (two-parent family, single-parent family, no parents) for both groups (mentees and comparison group) are reported in **Table 1**. Hyperactivity/inattention problems were assessed through a subscale of the Strength and Difficulties Questionnaire (SDQ; Muris et al., 2004; Italian version by Riso et al. (2010) and Marzocchi et al. (2002)). The subscale consists of five items ("I am easily distracted, I find it difficult to concentrate", "I am constantly fidgeting or squirming", "I am restless, I cannot stay still for long", "I finish the work I'm doing. My attention is good", "I think before I do things"), rated on a 3-point scale (1 = "Not True" to 3 = "Certainly True"). Item scores were averaged, with higher scores reflecting higher levels of hyperactivity and inattention problems (alpha T1 = 0.62; alpha T2 = 0.62). See the limitations section for more details about the

validity of the scale. Parental written consent and verbal consent from each participant were required before data collection.

Data Analysis

In order to evaluate the effect of the Mentor-UP program on hyperactivity/inattention, linear mixed-effects modeling (Pinheiro and Bates, 2000) was run using the R-package lme4 (Bates and Maechler, 2009). In this model, the dependent variable was the individual mean score for hyperactivity/inattention, whereas time (T1 = at the beginning of the program; T2 = at the end of the program), group (0 = classmates; 1 = mentees), age, gender (1 = male; 2 = female), nationality (0 = Italian; 1 = foreign), and parental status (0 = two-parent family; 1 = single-parent family or no parents) were treated as fixed effects.

Note that time is a within-subjects factor, while group, gender, nationality, and parental status are between-subject factors and age is used as a covariate. Participants were treated as random effects and the interaction between group and time was the key test in the model.

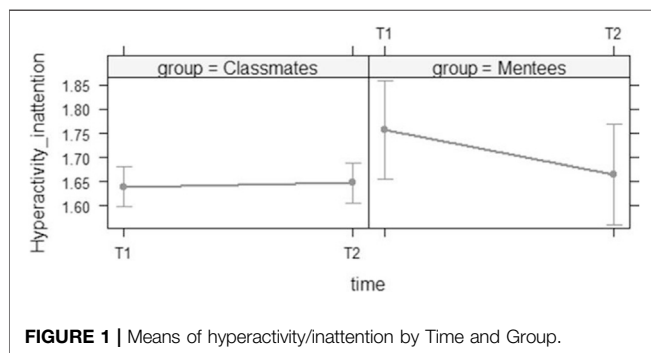
RESULTS

Table 2 presents the results of the linear mixed-effects model for hyperactivity/inattention. The covariate gender was significant (B = -0.10, $t(460) = -2.62, p = 0.009$): males showed higher levels of hyperactivity and inattention than females. Moreover, the covariate nationality was also significant (B = -0.10, $t(462) = -2.19, p = 0.029$), suggesting that immigrant students have lower levels of hyperactivity/inattention problems than Italian peers. Age and parental status were not significant. Hyperactivity/inattention did not decrease as function of time (B = 0.01, $t(449) = 0.38, p = 0.705$), but differed as function of group (B = 0.14, $t(632) = 2.37, p = 0.018$). Most importantly, the interaction between time and group revealed a significant effect on hyperactivity/inattention (B = -0.10, $t(450) = -2.00, p = 0.045$). Specifically, a decrease in hyperactivity/inattention over time was observed for mentees, but not for their classmates who did not take part to the program and showed lower levels of hyperactivity both at time 1 and time 2 (**Figure 1**). In terms of

TABLE 2 | Results of linear mixed-effects model: Fixed effects for time point, group (classmates vs. mentees), age, gender (male vs. female), nationality, and parental status (two-parents family vs. single-parent family or no parents) on hyperactivity/inattention.

	B (SE)	t
Intercept	1.69 (0.16)	10.43***
Time point (T1 vs. T2)	0.01 (0.02)	0.38
Group (Classmates vs. Mentees)	0.14 (0.06)	2.37*
Gender (Male vs. Female)	-0.10 (0.04)	-2.62**
Age	0.01 (0.01)	0.66
Nationality (Italian vs. Foreign)	-0.10 (0.05)	-2.19*
Parental status (Two-parent family vs. single-parent family or no parents)	0.06 (0.08)	0.79
Time point x Group	-0.10 (0.05)	-2.00*

Notes: Participants were treated as random effects ($N = 468$); (N mentees = 65, N comparison group of classmates = 403); * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.



effect size, the Cohen's $d = -0.21$ (Cohen, 1988) indicated a small effect.

DISCUSSION

The aim of the current study was to investigate the impact the Italian Mentor-UP mentoring program on hyperactivity and inattention problems in mentees (who were not clinically tested and did not have previous diagnosis of ADHD). Results showed a significant decrease in those problems among mentees as compared to their classmates not involved in the program. Results indicated that mentees have higher scores of hyperactivity/inattention at the beginning of the program as compared to their classmates, thus suggesting that staying still and concentrated at school might represent a challenge for mentees. As a preventive non-specific mentoring program, Mentor-UP is not developed to exclusively tackle hyperactivity and inattention problems and the main aim of the program was to develop a positive relationship between a mentor and a mentee, which is thought to foster positive changes in mentees' behaviors, including the reduction of hyperactivity and inattention problems (Rhodes and DuBois, 2008). From this perspective, we hypothesize that a possible mechanism of change underlying the decreasing in the outcome might reflect the model of youth mentoring proposed by Rhodes (2005), in which establishing enduring, trustworthy and caring mentoring relationships might foster the social-emotional and cognitive development of children. It could be argued that a non-specific mentoring program like Mentor-UP might have an impact on specific

outcomes, such as hyperactivity and inattention. That is, the mentor-mentee interactions and joint activities might have improved mentees' perception about their attention. First, this might be explained by the sufficient duration of the relationships that in Mentor-UP last for the entire school year (and beyond) and can provide the basis for the establishment of ties characterized by mutual trust and empathy (Karcher 2005; Rhodes and DuBois, 2008). Beyond the aspect of time, the literature in the field has repeatedly suggested that the type of the connection between mentors and mentees is relevant in order to observe changes (Rhodes and DuBois, 2008). More recently, Cavell and Elledge (2014) provided an updated definition of "mentoring-as-a-context" in which the relationship is crucial but it is also considered a place for preventive and focused activities (Cavell et al., 2021). Accordingly, during the meetings with mentees, mentors of Mentor-UP adopt a youth-centered style giving due consideration to mentees' preferences and individual characteristics, in line with international recommendations (e.g., Rhodes and DuBois, 2008). Such attitude, along with the engaging activities carried out together, in turn, might have contributed to create a space to train mentees' attention and challenge the negative views they may hold about themselves (including their perceived ability to be able to focus and be quiet). Thus, the context of mentoring relationship might affect mentees' outcomes, impacting positively also on mentees' perception of their hyperactivity and inattention behaviors. Second, in line with the "socio-emotional process" postulated in Rhodes' theoretical model (Rhodes, 2005), mentors of Mentor-UP program may serve as a model of self-regulation and positive behaviors in social contexts. The current study adds to the literature suggesting that mentors' ability to be calm and attentive may serve as a model also for youths experiencing some problems of hyperactivity and inattention. Indeed, in line with a vast literature (Bunford et al., 2015a; Bunford et al., 2015b; Semrud-Clikeman et al., 2010; Shiels and Hawk, 2010; Wheeler Maedgen and Carlson, 2000), those children have difficulties in emotional and behavioral self-regulation, that often result in negative relational experiences with peers and adults. Thus, mentors may play a crucial role, for example, by adopting a calm and respectful attitude towards the mentees and other people (e.g., teachers, parents, peers, and strangers) providing a good model of social behavior. During their

meetings, mentors in Mentor-UP help mentees to understand the dynamics of social interactions with peers and adults, to recognize their emotions and impulses and to regulate them, thus decreasing their perception to be inattentive and impulsive. Consequently, mentees may start trying alternative behaviors and regulating impulsive responses to events. Importantly, in Mentor-UP mentees are supported by caring mentors who show affection and avoid punishment. This might be particularly relevant, considering that, in general, youths showing some degree of inattention and hyperactivity are used to experience relational contexts characterized by high levels of frustration and distress, which can result in punishments and reprimands from adults (parents, teachers, sport instructors) (Aili et al., 2015; Foley, 2011). The literature on ADHD showed that symptoms of hyperactivity and inattention are associated with that type of sensitivity to reinforcement contingencies (Kohls et al., 2009). Therefore, although mentees in Mentor-UP do not have a diagnosis of ADHD, a similar mechanism can be implicated: it could be the case that when mentees in Mentor-UP receive from their mentors positive social feedbacks and rewards for their strengths as well as for improvements and positive behaviors (rather than severe punishment) they may be more motivated to keep the reinforced changes. As an example, a previous study on Mentor-UP also indicated that positive reinforcement further helps youths to start interacting with others more effectively, to perceive increased self-esteem and to generalize their skills in the interactions with classmates and teachers at school and with parents at home (Marino et al., 2020). A potential benefit of these new positive experiences is that mentees may be more likely to slowly learn to talk less excessively, to wait for their turn at school and to practice their communication skills during a conversation. In other words, hyperactivity problems might be, at least partially, lessen with a positive mentoring relationship.

With regard to inattention problems, in line with Rhodes' model (2005), the positive mentoring relationship can foster the cognitive development of the mentees. In Mentor-UP program, each pair meets every week in a fixed weekday and time so that mentees are exposed to a constant meeting weekly during which they are directly involved in time planning and organization of the activities with their mentor. Every week, the pairs agree upon how to spend the 2 h together and plan activities for the next week, either at school or around the city. At school, mentors support mentees in organizing their homework, encouraging them to stay focused on a specific task. Both at school and around the city, mentors explicitly show the mentees the importance of following the instructions, the rules and phases of each activity they do together (such as paying tickets to take the bus, be respectful to others, wait for their turn) and encourage the mentees to do the same. In this way, mentors contribute to increase mentees' organizational skills, by showing the mentees how to pay attention to actions and discussions, to organize homework and activities and to finish (or remain focused on) the activity planned for the meeting using problem solving strategies. In other words, the inattentive problems may be lessened, at least partially, in the context of mentoring, which aims to enhance the mentees organizational skills (e.g., Langberg et al., 2008).

Importantly, mentees can practice their skills in different contexts thus generalizing their new behaviors. The

involvement of both teachers and families in the Mentor-UP program may increase the likelihood that adults notice mentees' progress, thus further contributing to youths' positive self-perception (Marino et al., 2020).

From this viewpoint, the small observed improvement in hyperactivity and inattention might be due to the structural characteristics of the mentoring relationships, which is caring and structured at the same time. It has been shown that mentees benefit the most from mentoring when they receive support but also when there is "some degree of structure in their relationships with their mentors" (Rhodes and DuBois, 2008, p. 255). Therefore, our study support the beneficial effects not only of establishing an enduring, caring and structured connection between mentors and mentees, but also the potential role of these relationships as tools and context for prevention experiences (e.g., Cavell et al., 2021). Indeed, another possible explanation for the effectiveness of Mentor-UP may be that this structured approach focused on socio-emotional and cognitive development is consistent with traditional interventions that enhance the skills set of children with ADHD, by using modelling, role playing, verbal instruction, behavioral rehearsal, time-out, organization of school materials, coaching and reinforcement in order to facilitate emotional and behavioral self-regulation in clinical settings (Glass et al., 2000; Corrin, 2004; Meinzer et al., 2018). This coherence across treatment and preventive strategies might help in explaining the underlying mechanism leading a positive relationship to result in a modest decrease of hyperactivity and inattention in a non-clinical sample of mentees.

However, it should be noted that the effect size of the pre-post change of hyperactivity and inattention is small (Cohen, 1988), in line with the majority of the studies using a youth mentoring model (DuBois et al., 2011). Nevertheless, hyperactivity problems are among the behaviors that teachers most complain about (Kos et al., 2006; Lawrence et al., 2017) and as such it was specifically chosen in this program as a target behavior. As a note, in the final meeting organized at the end of the Mentor-UP program, teachers reported their satisfaction for the social and behavioral changes observed in mentees, especially with regard to increased attention during lessons and increased quality of relationships with peers and adults. Unfortunately these comments were not systematically recorded and we could not include this type of data in the current study.

With regard to control variables, in line with several studies on hyperactivity and inattention, the levels were higher in males rather than females (Arnett et al., 2015; Willcutt, 2012). Moreover, results showed that immigrant mentees have lower levels of hyperactivity and inattention. This in contrast with part of the literature on ADHD and immigrant background, which shows a higher likelihood of developing those symptoms in immigrant children (e.g., Rydell, 2010). However, there are other studies showing equal (Holmberg and Hjern, 2008) or lower (Derluyn et al., 2008) levels of hyperactivity and inattention in immigrant children. It is possible that different cultural backgrounds are associated to different risks of developing hyperactivity and inattention. Furthermore, parental status was not related to the outcome in the current study. This is also not in

line with evidence showing that children living in a single-parent family are more likely to have ADHD symptoms as compared with children living in two-parent families (Russell et al., 2016). However, this result should be taken very cautiously as the number of participants living in single-parent families (or not living with any parent) was considerably lower than two-parent families in this sample.

Limitations

Although this study adds to the literature supporting the efficacy of a mentoring program in reducing hyperactivity and inattention in a non-clinical sample of students, there are a number of limitations. These include reliance on self-report measures only, the relatively short follow-up period, and limited generalizability due to a modest sample from a North Italy region. Assessments should include also a multi-informant approach, for example through parents and teachers' reports, in order to increase the validity of the results. Unfortunately, we could include just the SDQ self-report in the protocol for the feasibility of the program (i.e., difficulties in engaging parents and teachers in the evaluation process). However, to date, there are some evidence that the SDQ self-report is reliable as acceptable correlations were found with parents and teachers reports (Goodman et al., 2010). Becker et al. (2004) stated that the self-reported answers by children and adolescents can be considered of value in absence of adult information. Importantly, the program staff did not administer a structured, diagnostic interview for ADHD and it might be that some mentees had undiagnosed ADHD as the SDQ subscale is not designed to make a diagnosis and the Cronbach's alpha was only marginally satisfactory. Given the concern about the reliability and validity of the SDQ self-report, further studies are needed. Moreover, a comparison of these results in a clinical sample of children with ADHD is warranted. Furthermore, mentees were not randomized to the intervention and comparison group and the latter scored lower in hyperactivity at the beginning of the program thus suggesting that the two groups were not equal in the outcome variable. The small sample size of mentees distributed in different classrooms did not allow to take into account the nested data. Moreover, sample size was determined by program feasibility (e.g., the number of mentees and classmates included in each year of the project) and not by a priori power analysis. Future research with objective measures of hyperactivity and inattention, longer follow-up periods, and more diverse samples is therefore needed. Other starting points for future studies could include measures on the quality of the relationship, which could have led to a different impact on hyperactivity/inattention. Evaluation of the program on a larger random sample is also required.

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CONCLUSION

Despite these limitations, to our knowledge, this is the first study evaluating the effectiveness of a community- and school-based mentoring program in relation to hyperactivity and inattention problems in a sample of youths in Italy, showing small but promising results. Beyond the specific characteristics of the program and its effectiveness, the program structure of Mentor-UP is aligned with the international best practices for mentoring programs (including mentor training, matching, and supervision; DuBois, 2002; Randolph and Johnson, 2008). Therefore, although the results can not be entirely generalized, they are suggestive of a potential important role of mentoring relationships as a means for decreasing mentees' problems related to hyperactivity and inattention.

Given the spread of socio-emotional and behavioural problems in youths and their impact on well-being and school adjustment, future research should evaluate the effectiveness of these preventive strategies to support positive youth development (Kupersmidt et al., 2017).

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

AUTHOR CONTRIBUTIONS

CM Conceptualization, Methodology, Writing—original draft, Writing—review and editing. RC Writing—original draft, Writing—review and editing. NC Writing—original draft, Writing—review and editing. Supervision. ML Writing—review and editing. MB Conceptualization, Data collection, Writing—review and editing. SB Conceptualization, Data collection, Writing—review and editing. MS Conceptualization, Data collection, Writing—review and editing. Supervision, Project administration.

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