

A NEUROPSYCHOPEDAGOGICAL TRAINING FOR ADOLESCENTS: AN EXPLORATORY STUDY ON SELF- COMPASSION AND DETECTION OF BULLYING EPISODES

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Abstract

The COVID-19 pandemic influenced adolescents' psychological wellbeing and the frequency of bullying and cyberbullying. Literature highlights that self-compassion could protect adolescents' mental health. In the present study, the impact of the neuropsychopedagogical training Envisioning the Future (EF) on adolescents is investigated. Three-hundred and fourteen (N=314) Italian adolescents (59% females; Mean age=15.41 years, SD=1.94) answered an online questionnaire in two stages, at the beginning (t1) and end (t2) of EF. The questionnaire included the Self-Compassion Scale (Neff, 2003; Veneziani et al., 2017) and two ad-hoc items on the perceived frequency of bullying and cyberbullying episodes among peers (0=never to 4=once a day). Data were analyzed using paired sample t-tests with frequentist and Bayesian approaches. From pre- to post-EF, frequentist t-tests reveal an increase in self-kindness $t(314)=-2.68, p=.008$, common humanity $t(313)=-3.76, p<.001$, frequency with which adolescents perceive bullying $t(313)=-8.9, p<.001$ and cyberbullying $t(313)=-5.22, p<.001$. Bayesian t-tests corroborate the results, revealing extreme evidence ($BF_{10}<100$) of an increase in the perceived frequency of bullying and cyberbullying, strong evidence ($30<BF_{10}<100$) of an increase in common humanity, anecdotal evidence ($1<BF_{10}<3$) of an increase in self-kindness. The paper highlights the beneficial effects of EF on adolescents' socio-emotional wellbeing, and lays ground for further research on the training.

Keywords: neuropsychopedagogy; self-compassion; bullying; cyberbullying; adolescence

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Introduction

The COVID-19 pandemic challenged the well-being and quality of life of individuals, particularly the youngest (Paoletti et al., 2022). Specifically, adolescents experienced multiple difficulties, on a psychological, relational, and social level: the obligation to stay at home for long periods, the limitation of social contact with peers, the uncertainty about the future, and the drastic change in daily routines (Farooq et al., 2021; Oliveira et al., 2022). Furthermore, the increased use of technology among adolescents during the pandemic period increased the risk of unhealthy use of digital devices, fostering the diffusion of cyberbullying (Evli & Şimşek, 2022). Bullying encompasses a constellation of actions (*e.g.*, verbal, physical, and psychological) practiced recursively and deliberately, by one or more individuals, to harm peers who are perceived as vulnerable, different, or less popular than the perpetrators, in the presence of passive bystanders (Salmivalli et al., 2021).

Since the internet can expose young users to specific situations that are detrimental to their psychosocial health, it is important to note that cyberbullying is not just a form of traditional bullying translated into the world of the internet (Perasso & Barone, 2018). There are several specific features defining cyberbullying: (i) bystanders are a potentially infinite audience; (ii) cyberbullying can occur at a variety of times, places, and modalities, often without the victim's knowledge, in virtual environments with specific characteristics (*e.g.*, social networks); (iii) perpetrators may be covered by anonymity or false identities; and (iv) harmful content spread online once can create a recursive, long-term process of victimization (Hellfeldt et al., 2020).

Concerning the global health emergency, Chen & Espelage (2021) found that self-reported bullying victimization has decreased compared to pre-pandemic levels. In contrast, Wachs & Hébert (2021) showed an increase in bullying perpetration and victimization during the pandemic, particularly among adolescents who perceived high social isolation or with previous mental health problems. The literature points out that the COVID-19 pandemic has increased educational poverty, distress in family relationships, and decreased social interactions, factors that may have increased the risk of bullying in the current generation of adolescents (Doty et al., 2022).

In this sense, thinking about preventive interventions that promote positive individual and community psychosocial resources is crucial for the psychophysical health of adolescents. For example, according to Gutiérrez-Hernández et al. (2022), self-compassion may have played a protective role in adolescents' mental health during the COVID-19 pandemic. Self-compassion involves treating oneself with care and support during adversity, perceiving personal experiences as an opportunity for self-awareness and improvement, and limiting self-judgment after a failure. The three basic elements of self-compassion are self-kindness, sense of common humanity (at a relational level), and, at a cognitive level, mindfulness, respectively opposed to self-judgment, isolation, and over-identification (Neff, 2003). In adolescents, high levels of self-

compassion are associated with: adaptive coping and post-traumatic growth (Bluth et al., 2022) and a greater sense of community (Akin & Akin, 2015). Finally, this construct can mitigate the negative effects of being bullied (Múzquiz et al., 2022).

In the school context positive education can constitute a powerful tool to reinforce adolescents' well-being and to promote the effectiveness of pedagogical practices after the pandemic (White et al., 2021; Paoletti et al., 2022; Perasso et al., 2023). Focusing on how to promote positive personal and relational resources such as self-compassion, positive social relationships, and sensitivity to the suffering of others could be a turning point in indirectly counteracting bullying and cyberbullying. In this regard, specific interdisciplinary training interventions for adolescents could foster a greater ability to establish positive relationships, firstly with oneself and then with others. In other words, it is crucial to reduce the objectification of others and promote a sense of belonging to the humanity of which each individual is a part.

In this perspective, the proposed neuropsychopedagogical intervention "Envisioning the Future" (EF), which is the subject of this study, aims to increase adolescents' awareness and sensitivity to their history, strengths, and weaknesses to transform them into opportunities for knowledge and growth, aiming for a curious, kind, non-judgmental and non-competitive attitude towards themselves and others. This preliminary study investigated whether EF training can improve adolescents' well-being and susceptibility to reporting forms of prevarication and peer violence such as bullying and cyberbullying.

The neuropsychopedagogical training "Envisioning the Future"

The COVID-19 pandemic and its effects have highlighted the urgency for individuals and societies to fortify themselves (Paoletti et al., 2022) by promoting the psycho-physical well-being of the population, particularly adolescents. In this sense, EF has been applied in the school context, during the pandemic and post-pandemic period. EF is a neuropsychopedagogical training created by Fondazione Patrizio Paoletti (Italy) and carried out with the collaboration of the University of Padua (Italy) in different contexts, obtaining positive results concerning individual and contextual well-being: in the penal circuit (Paoletti et al., 2023a), in emergency contexts (Paoletti et al., 2023b) and in the school context (Perasso et al., 2023). The EF training, described in this paper, has been adapted to the school context, targeting Italian secondary schools, to provide students with theoretical-practical notions on resilient brain functioning and on increasing the active and positive resources of the individual and the community.

EF is a training based on the theoretical framework of the Sphere Model of Consciousness (SMC) (Paoletti & Ben-Soussan, 2019), connected to the four neuropsychopedagogical principles of Observation, Mediation, Translation, Normalization, basic ideas of the Pedagogy for the Third Millennium (PTM) method (Paoletti, 2008). The macro-objective of EF, in the school context, is to increase individual and relational well-being through the promotion of positive resources such as self-compassion, stimulating students' capacity for a kind and

non-judgmental attitude towards oneself, and the perception of the interconnection between individuals. EF consists of an interdisciplinary thematic training course called the 10 Keys to Resilience (Paoletti et al., 2022).

The 10 keys are organized according to the 4 neuropsychopedagogical principles of PTM (Paoletti, 2008) (Table 1) and integrate notions about optimal resilient brain functioning with specific practical exercises (*e.g.*, self-blessing and the practice of silence). These tools stimulate participants on multiple levels: (i) the intentional use of attentional and evaluative processes oriented towards recognizing automatic non-functional forms of thinking, and behavior to focus on psychophysical strategies towards wellbeing, (ii) the regulation of emotions through training in recognizing, accepting without judgment, and managing emotions, (iii) the positive cognitive reappraisal of the experiences, related not only to individual wellbeing but also to that of the whole humanity.

Table 1. Description of the Fondazione Patrizio Paoletti's 10 keys to resilience (revised version from Paoletti et al., 2022)

Key	Strategy	Neuropsychopedagogical principle*
(1) Start again with what you can control and make small decisions	<i>Bringing attention to the breath and focusing on the here and now, making small decisions to overcome uncertainty and strengthen willingness</i>	Observation and self-observation
(2) Identify a goal that is achievable, inspiring and measurable	<i>Setting goals, foreseeing obstacles and cultivating positive beliefs</i>	Observation and self-observation
(3) Several times a day be aware of your posture	<i>Cultivating awareness about one's posture and managing psychophysical processes to increase attention, psychophysical energy, positive attitude to the events</i>	Observation and self-observation
(4) Get inspiration from the stories	<i>Learning about and identifying resilience models to refer to Rewrite their own history by transforming vulnerability into opportunities for growth, for themselves and others</i>	Mediation
(5) Ask yourself what is really important	<i>Training self-motivation by listening to their innermost preferences</i>	Mediation
(6) Cultivate gratitude	<i>Learning to cultivate positive emotions (e.g., gratitude) and to manage, transform, use the negative ones</i>	Mediation
(7) Appreciate the other as a resource, cultivate and expand your social network	<i>Listening, sharing experiences, increasing interpersonal and social resources</i>	Translation
(8) Cultivate curiosity	<i>Learning from everything and from every experience</i>	Translation
(9) Practice a few minutes of silence	<i>Practice the technique of intentional silence several times a day, accepting and non-judging, and then visualizing the best version of themselves</i>	Normalization
(10) Embrace and transform: before you go to bed, generate your tomorrow today	<i>Self-programming oneself and envisioning the future through the daily technique of self-blessing</i>	Normalization

Note:* Paoletti, 2008

Objective

The general aim of the study is to assess whether several key psychological variables in adolescents are positively impacted by the neuropsychopedagogical training Envisioning the Future (EF). Specifically, this exploratory study aims to investigate whether and how attending EF impacted the variables related to the positive sub-dimensions of self-compassion and the frequency with which adolescents report incidents of bullying and cyberbullying among peers.

Methods

Participants

Three hundred fourteen (N=314) adolescents (59% female, 98% Italian), with a mean age of 15.41 years (SD=1.94; between a minimum of 12 and a maximum of 19 years) took part in the study. Secondary school students (11-13 years) were 31.5% of the sample, and secondary school students (14-18 years) were 68.5%. The sample came from 12 schools in different Italian cities (40% Rome, 24% San Benedetto del Tronto, 16% Oristano, 10% Acerra, 3% Assisi, 3% Foggia, 2% Bergamo, 1% Santa Maria degli Angeli, 1% Porto d'Ascoli, 0.1% Ascoli Piceno).

Measures

Participants answered an online questionnaire in two stages, at the beginning of the training (t1, March 2022) and after the training (t2, May 2022). The questionnaire included the Self-Compassion Scale (Neff, 2003; Veneziani et al., 2017) and two ad hoc items on the frequency of bullying and cyberbullying among peers. The Self-Compassion Scale (SCS) consists of 26 items, equivalent to different behaviors: the respondents answer on a Likert scale (e.g., from 1=almost never to 5=almost always) how often they engage in such behavior. The scale detects 6 dimensions, ordered in 3 different polarities: self-kindness vs. self-judgment, common humanity vs. isolation, and mindfulness vs. over-identification. The ad-hoc scale on the frequency of bullying and cyberbullying was preceded by a definition of the constructs, a dichotomous question (e.g., “Yes” vs. “No”) on the presence or absence of the phenomenon in the school attended (i.e., Do you think bullying and cyberbullying dynamics occur in your school among students?), and it is composed of two questions (i.e., Could you tell how frequently bullying occurs at school?; Could you tell how frequently cyberbullying occurs at school?). The respondent can use a time-frequency scale (e.g., 4=once a day, 3=once a week, 2=once a month, 1=once every three months, 0=never).

Procedure

The 2022 edition of the EF project, adapted for the school and ran from March to May 2022, lasted for 9 weeks in which 11 one-hour meetings were held in blended mode. Each session involved: i. dialogical reflection on the topic; ii. sharing of neuropsychopedagogical notions; iii. guided individual and group

practical experiences. Finally, the learner is invited to practice the theoretical-practical exercises between the lessons. The research project was developed by the Research Institute for Neuroscience Education and Didactics (RINED) of Fondazione Patrizio Paoletti (Italy), in collaboration with the University of Padua (Italy), whose Ethics Committee approved the study (protocol number 1636/2023, 2023-UNPDD04-001636).

Convenience sampling was carried out, involving schools whose teachers and school leaders had participated in Fondazione Patrizio Paoletti online courses (accredited by the Ministry of Education, University and Research), between April 2021 and February 2022. The students participated in the EF training (2022 edition) between March and May 2022, during the final phase of the pandemic, with the informed consent of their families. The research required the completion of a test battery in two phases (*e.g.*, t1, March 2022; t2, May 2022). To associate the data of the same participants from t1 to t2, an identifying pseudonym was required (*e.g.*, the first two letters of the city of birth and the last four digits of the mobile phone number). This pseudonymization made it possible to compare the scores of the same sample over time while protecting the anonymity of the participants.

Data analysis

To evaluate pre-EF and post-EF differences related to the dimensions of self-compassion in adolescents and the frequency with which they report episodes of bullying and cyberbullying, paired sample t-tests were conducted by using a frequentist and Bayesian approach.

Results

From t1 to t2 (Table 2), t-tests show a statistically significant increase in adolescents' self-kindness $t(314)=-2.68$ $p=.008$ [Coehn's $d=.21$, post-hoc Power ($1-\beta$ err prob)=.98] and common humanity $t(313)=-3.76$ $p<.001$ [Coehn's $d=.26$, post-hoc Power ($1-\beta$ err prob)=.99]. They also more frequently report episodes of bullying $t(313)=-8.9$ $p<.001$ [Coehn's $d=.68$, post-hoc Power ($1-\beta$ err prob)=1.00] and cyberbullying among peers $t(313)=-5.22$ $p<.001$ [Coehn's $d=.41$, post-hoc Power ($1-\beta$ err prob)=1.00] (Table 3).

Table 2. Mean in t1 and t2 of adolescents' (N=314) self-compassion, frequency of bullying and cyberbullying

Variables	M (t1)	SD (t1)	M (t2)	SD (t2)
Self-kindness	2,77	1,07	2,92	1,01
Self-Judgement	3,32	1,04	3,27	,93
Common Humanity	2,72	,94	2,96	,95
Isolation	3,31	1,08	3,29	,93
Mindfulness	2,99	,92	3,07	,92
Overidentification	3,24	,99	3,24	,91
Bullying frequency	,51	,54	1,09	1,11
Cyberbullying frequency	,58	,64	,91	,97

Table 3. Paired sample t-tests (frequentist approach) comparing t1 (before-EF) and t2 (after-EF) of N=314 adolescents

Variables	M	SD	SEM	95% CI		t	df	p
				Lower	Upper			
Self-kindness pre-post	-,14	,98	,05	-,25	-,03	-2,68	313	,008
Self-judgement pre-post	,05	,98	,05	-,05	,16	1,01	313	,312
Common humanity pre-post	-,22	1,07	,06	-,34	-,11	-3,76	313	,000
Isolation pre-post	,01	1,01	,05	-,09	,12	,31	313	,764
Mindfulness pre-post	-,08	1,01	,057	-,19	,03	-1,43	313	,152
Overidentification pre-post	,01	1,05	,05	-,11	,12	,09	313	,926
Bullying Frequency pre-post	-,57	1,13	,06	-,69	-,44	-8,95	313	,000
Cyberbullying Frequency pre-post	-,32	1,09	,06	-,44	-,21	-5,22	313	,000

Bayesian-approach t-tests confirm the difference from t1 to t2 [H_1 =alternative hypothesis (there is a statistical difference between t1 and t2) and H_0 =null hypothesis (there is no statistical difference between t1 and t2)], supporting an increment in the frequency with which adolescents: a) report bullying ($BF_{10}=1,452e+14$; error%=2. 620e-17) and cyberbullying ($BF_{10}=27765.550$; error%=2.602e-7) (extreme evidence, with BF_{10} greater than 100) and b) perceive common humanity ($BF_{10}=60.904$; error%=1.348e-4) (strong evidence, with BF_{10} between 30 and 100) and self-kindness ($BF_{10}=2.139$; error%=0.004) (with anecdotal evidence, BF_{10} between 1 and 3) (Jeffreys, 1961).

Discussion

The pandemic outbreak of COVID-19 had negative effects on the psychological health of individuals, especially adolescents (Paoletti et al., 2022) who faced multiple challenges (*e.g.*, social distancing, limited interactions with peers, adaptation to distance education) (Perasso et al., 2023). The transient change and discontinuation of interactions with peers, provoked by the Covid-19 pandemic, led, according to Chen and Espelage (2021), to a decrease in peer bullying; otherwise, according to Wachs and Hebert (2021) the phenomenon instead increased. At the same time, it is impossible to ignore that the pandemic led to an increase in the use of digital devices among young people, which may pose potential risks, including the growth of cyberbullying episodes (Evli & Şimşek, 2022). The results of the present research highlight how the neuropsychopedagogical training EF can bring positive emotional and socio-relational effects to adolescents, educating them to improve their relationship

with themselves and peers, and overcoming the difficulties related to the pandemic period.

The compare means t-tests, using frequentist and Bayesian approaches, emphasize that after the EF training, adolescents present a higher level of self-kindness, a greater sense of common humanity, and report perceiving bullying and cyberbullying episodes more frequently. The results are consistent with previous research on self-compassion (Neff, 2003), which describes it as a promising variable for protecting and enhancing the psychological health of younger people (Gutiérrez-Hernández et al., 2022; Neff, 2003). The EF training, through the 10 Keys to Resilience, works on increasing personal awareness of the inner self and relationship with others. The acceptance of both their own vulnerabilities and strengths with a curious, kind, and nonjudgmental attitude, stimulates adolescents to overcome distress and loneliness, enabling them to feel part of a larger community in which it is possible to appreciate others in their diversity and uniqueness. Among adolescents, the promotion of methods and techniques of proactive re-signification of their own experience (even if negative), benefiting not only themselves but also others (Paoletti et al., 2022), constitutes the basis for the perception of a newfound sense of common humanity (Neff, 2003). EF, just as the pandemic was nearing closure in Italy (March-May 2022), seemed to awaken in young people a sense of self-kindness, a fundamental component of self-compassion (Neff, 2003), the increase of which implies a greater ability to treat themselves with empathy and tolerance, even in the face of mistakes and failures. Feelings of inadequacy, anger, fear, and guilt were shared by most of the population during the global pandemic. To counteract them, conscious and kind acceptance does not coincide with a resigned and passive attitude but it activates resources for change, encouraging individuals to focus on positive relational chances, both internally (*e.g.*, with the self) and externally (*e.g.*, with others) (Rashid et al., 2021). The results are consistent with previous literature that has emphasized that adolescents who are more self-compassionate develop more adaptive coping strategies and greater awareness of their emotions (Bluth et al., 2022). Concurrently, the EF training also seems to have affected the dimension of common humanity, awakening adolescents' awareness of what is happening in their interpersonal context, at school, and on the Internet. These exploratory findings call for considering the EF training within the strand of primary prevention (Evans et al., 2014) to counteract bullying and cyberbullying. In fact, in line with previous literature (Salmivalli et al., 2021), the EF training may have worked on bystanders (*i.e.*, passive observers of bullying and cyberbullying dynamics), to increase their awareness of peer victimization.

Conclusion

In Italy, this is the first research measuring the impact of the neuropsychopedagogical training EF on adolescents' self-compassion and their

perception of the frequency of bullying and cyberbullying in their context. After the EF neuropsychopedagogical training, a positive change in adolescents' well-being was reported. In fact, a greater self-kindness, a greater sense of common humanity, and an increase in the frequency with which adolescents perceive the frequency of bullying and cyberbullying in their school context emerged. These findings provide the basis for further studies on the promotion of self-compassion, which may play a protective role in adolescents' mental health with implications for counteracting phenomena of deliberate and reiterated peer victimization and violence. In addition, this study draws the attention of psychologists, teachers, and researchers to the importance of developing interdisciplinary interventions and prevention programs for promoting adolescents' well-being. Such programs can foster personal growth, closely linked to interpersonal and community awareness, through knowledge and techniques for understanding human brain functioning.

Limitations and future research directions

This study has methodological limitations (Kazdin, 2003). The use of a self-report questionnaire may have given rise to social desirability bias in the participants. Pseudonymized administration (*e.g.*, the use of identifying acronyms) was adopted precisely to protect the anonymity of the adolescents, ensuring greater spontaneity, without losing the ability to statistically compare pre- and post-training scores. Moreover, questionnaire administration in classrooms, when investigating relational phenomena such as the perception of bullying and cyberbullying, could have led to bias in the responses, possibly buffered by teacher supervision.

Considering the results obtained, future research should replicate the study with a larger sample to ensure greater generalizability of the results. The absence of a comparison group also limits the possibility of a cross-sectional evaluation of the impact of the EF training. Future editions of the training and research could benefit from collecting data on a group of adolescents not participating in the intervention. Similarly, it might be important to explore the long-term and short-term effects of EF, including follow-up from three months after t2, as well as long-term effects, including follow-up from 12 months after t2 (Kazdin, 2013). Future studies could also investigate interactions (*e.g.*, mediation and moderation) between the dimensions of self-compassion, the frequency with which adolescents report perceiving bullying and cyberbullying, and specific components of the EF training. In addition, future studies could offer more systematic and longitudinal insights into the characteristics of specific variables such as self-compassion, coping, resilience, and prosociality. Finally, the present exploratory study allowed for improving and strengthening the final research design of the next editions of EF.

Ethics statement

The research project was developed by the Research Institute for Neuroscience Education and Didactics (RINED) of Fondazione Patrizio Paoletti (Italy), in collaboration with the University of Padua (Italy), whose Ethics Committee approved the study (protocol number 1636/2023, 2023-UNPDD04-001636). In accordance with the Declaration of Helsinki, all parents gave informed consent for adolescents' participation in the study.

Conflicts of interest

The authors declare no conflict of interest.

Author contributions

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication. TDG, GP, GS, CL, AS wrote the paper. GP conducted the statistical analyses. AM and FV revised the paper. TDG coordinated the work.

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