



MULTILATERAL TRAINING METHOD AS A PROACTIVE EDUCATIONAL STRATEGY TO PREVENT BULLYING IN ADOLESCENTS

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Abstract:

To date, there is no standard definition of bullying, however, it can be characterized as a type of aggression, systematic and repeated, and based upon an imbalance of power in relationships through repeated verbal, physical and/or social behaviour that intends to cause physical, social and/or psychological harm. Youth with higher levels of resilience and self-efficacy are less likely to engage in aggressive behaviours or be victims of bullying. Previous anti-bullying approaches have often achieved no reduction in bullying behaviour. Therefore, the purpose of this study was to examine the effect of 12 weeks of extracurricular multilateral training on the risk for students (14-16 years) to be involved in bullying. Sixty male students were allocated to an experimental group (n = 30) that performed psychoeducational activities combined with physical exercise training and team games (90 min, 2d·week⁻¹) or control group (n=30). Before and after the intervention, we used CYRM-28 that assessed individual capacities and resources, relationship with primary caregiver, contextual factors and total resilience, and SEQ-C that measured academic, social, emotional, and total self-efficacy. Four participants from the experimental group withdrew. Significant improvements of crucial relevance were found for the resilience and self-efficacy scales ($p < 0.05$) in the experimental group. We found that extracurricular multilateral training may improve the resilience and self-efficacy in

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adolescents and make them less likely to engage in aggressive behaviour or be bullied. Multilateral training method should be considered as an effective alternative to the anti-bullying approach, highlighting the crucial role of the Physical Education professionals in the promotion of proactive educational strategies to prevent bullying.

Keywords: special education; resilience; self-efficacy; physical exercise; victimization

1. Introduction

Bullying is a controversial issue, however, there is no standard definition of bullying (Rigby, 2008), and it is difficult to establish a definition inclusive of all bullying behaviours (Lines, 2008). Research suggests bullying can be characterized as (1) a type of aggression (Pellegrini, 2004), (2) systematic and repeated (Olweus, 1993), and (3) based upon an imbalance of power (Bouman et al., 2012). These behaviours occur both directly and indirectly and can lead to negative social consequences. Examples of commonplace power differences in school include being able to physically hurt others, numerical (group) superiority, being more confident or assertive than others, having greater verbal dexterity, having superior social or manipulative skills, and having greater status and corresponding capacity to impose will on others (Rigby, 2008). Antibullying strategies are the main approach addressing bullying in schools (Farrington & Ttofi, 2009) and claim substantial support to address bullying. However, antibullying approaches are often found to achieve no reduction or observe increases in bullying behaviour (Moore & Woodcock, 2017a; Rigby, 2002).

Resilience is a complex construct (Kaplan, 2006) that is defined as the attainment of positive outcomes, adaptation, or developmental milestones in the face of significant adversity, risk, or stress (Goldstein & Brooks, 2006). Different conceptualisations describe resilience as (a) a protective process; (b) the interaction of protection and risks; and (c) a conceptual tool within predictive models (Elias, Parker, & Rosenblatt, 2006). The operational definition of resilience varies and has included: hardiness, optimism, competence, self-esteem, social-skills, achievement, and absence of pathology in the face of adversity (Prince-Embury, 2007). The research examining the relationship between bullying and resilience is not extensive (Sapouna & Wolke, 2013), and findings include: (a) students with a strong resilience profile were less likely to engage in aggressive behaviours or be bullied than those who reported fewer developmental strengths (Donnon, 2010); (b) bullying appeared to decrease if social skills were improved in victims, and those nonchalance strategies and emotional regulation were useful (Lisboa & Killer, 2008); and (c) resilience to bullying was improved if the student had a peer or family member with whom to disclose (Bowes, Maughan, Caspi, Moffitt, & Arseneault, 2010; Rivers & Cowie, 2006).

Some authors showed that the practice of physical activity is an excellent means for the transmission of values (Portolés & González, 2015) and helps to promote prosocial attitudes (González et al., 2016), so it can be useful in prevention and treatment of

bullying. Young people can develop resilience and self-efficacy through participation in physical activity and sport (Bandura, 2012; Schiraldi 2011). Furthermore, the youth—particularly males—with higher social self-efficacy are somewhat more likely to resist pressure to engage in risky behaviours, such as delinquent behaviour and being victimized (Ludwig & Pittman, 1999). However, it seems that the amount of physical activity carried out and the type of sport practised can act as regulators in the victimization caused by bullying (Cascales & Prieto, 2019). For example, moderate physical activity that is geared towards disciplines such as football or athletics implies greater victimization in all dimensions while one oriented towards traditional martial arts or popular games involves lower victimization rates (Macarie & Roberts, 2010). Also, in a recent systematic review, it was mentioned that few studies relate bullying to physical activity and sport (Baena & Bosca, 2018; Holt, 2016).

Accordingly, we may speculate that the multilateral training method, which includes psychoeducational activities combined with physical exercise training and team games, may be an effective anti-bullying alternative approach (Hartmann, 2003). Therefore, the purpose of this study was to examine the effects of 12 weeks of an extracurricular multilateral training program on the risk for students to be involved in bullying (bully and victim), through the analysis of the resilience and self-efficacy variables. It was hypothesized that multilateral training method would improve the resilience processes and perceived self-efficacy.

2. Material and Methods

2.1 Study design

The study was a 12-week high school-based intervention that has been evaluated using a randomized controlled study. Data were collected and recorded at baseline (Pre-test) and after 12 weeks (Post-test). After pre-test and randomization, the experimental group received multilateral training. The control group received the same training program after the post-intervention assessment. The design has been facilitated by use of standardised tests, which increase the validity and reliability of data as such instruments have been developed and normalised using larger samples and have been piloted to ensure test items measure what is intended (Cohen & Swerdlik, 2005).

2.2 Participants

Sixty male adolescents (mean age, 14.59 ± 0.71 ; range, 14-16 years;) from two local high schools were recruited to participate in the study. The socioeconomic status of all participants was reported as middle. Power calculations were conducted to determine the sample size required to detect changes in the dependent measures resulting from multilateral training. An a priori power analysis (Faul, Erdfelder, Lang, & Buchner, 2007) with an assumed type I error of 0.05 and a type II error rate of 0.10 (90% statistical power) was calculated and revealed that 46 participants in total would be sufficient to observe medium 'Time x Group' interaction effects. The following inclusion criteria were applied:

a) male gender, b) aged between 14 to 16 years, and c) not involved in regular exercise during the last two years. Participants were excluded if they had a chronic paediatric disease or had an orthopaedic condition that would limit their ability to perform the exercise. All participants and their parents received a complete explanation in advance about the purpose of the experiment and the parents provided written consent to the study. The study was conducted in accordance with the Declaration of Helsinki, and the protocol was approved by the local Ethics Committee. The study was conducted from September to December 2019.

2.3 Procedures

The recruitment occurred from schools within an area of proximity to where one of the researchers was working. The school staff distributed information and consent forms to all students to be recruited and their parents. Participants were verbally reminded that participation was voluntary, that they could discontinue the survey at any point, and that their responses were confidential and anonymous. Participants were instructed regarding (a) not writing their names on the survey, (b) how to respond to rating scales, and (c) how to correct responses. Participants were not given definitions of bullying, resilience, or self-efficacy to not bias their responses. Surveys were then provided to participants.

Randomisation into experimental ($n = 30$; age 14.54 ± 0.71 years) and wait-list control group ($n = 30$; age 14.63 ± 0.72 years) occurred after pre-intervention assessments. Participants were pair-matched based on age and the randomization was carryout by Research Randomizer, a program published on a publicly accessible official website (www.randomizer.org). The researchers were blinded to this randomisation of experimental and control group allocations. Fifty-six participants completed the post-intervention assessment, and four participants of the experimental group did not complete the study for unknown reasons.

2.4 Measures

To evaluate the effects of the multilateral training method, two standardised psychometric instruments were used: Child and Youth Resilience Measure (CYRM-28) (Liebenberg, Ungar, & Van de Vijver, 2012; Ungar & Liebenberg, 2011), and the Self-Efficacy Questionnaire for Children (SEQ-C) (Muris, 2001; Suldo & Shaffer, 2007).

The *CYRM-28* is a 28-item instrument that measures various aspects of children's and adolescents' resilience. The scale provided a total resilience scale ($\alpha = 0.86$) and three subscales including an individual capacities and resources scale ($\alpha = 0.84$), relationship with primary caregiver scale ($\alpha = 0.84$), and contextual factors scale ($\alpha = 0.83$). Items are scored on a 5-point Likert scale with 0 = not at all, 1 = a little, 2 = somewhat, 3 = quite a bit, and 4 = a lot. The *CYRM-28* is designed as a screening tool to explore the resources (individual, relational, and contextual) available that bolster resilience competence in the face of adversity. Individual resources are individual personal skills (e.g., I am aware of my own strengths), individual peer support (e.g., I feel supported by my friends), and

individual social skills (e.g., I know where to go in my community to get help). Relational resources are physical caregiving (e.g., My caregiver(s) watch me closely) and psychological caregiving (e.g., I talk to my caregiver(s) about how I feel). Contextual resources are spiritual (e.g., Spiritual beliefs are a source of strength for me), educational (e.g., Getting an education is important to me), and cultural (e.g., I am proud of my ethnic background). Higher scores indicate a greater presence of resilience processes.

The SEQ-C is a 24-item instrument that measures various aspects of children's and adolescents' self-efficacy. The scale provided a total self-efficacy scale and three subscales: (1) academic self-efficacy (eight items) which is concerned with the perceived capability to manage one's academic affairs (e.g., "How well can you study when there are other interesting things to do?"); (2) social self-efficacy (eight items) which has to do with the perceived capability for dealing in an effective way with other people (e.g., "How well can you become friends with other children?"); and (3) emotional self-efficacy (eight items) which pertains to the perceived capability of coping with negative emotions (e.g., "How well can you control your feelings?"). The SEQ-C scales have good cross-cultural validity (Minter & Pritzker, 2017) and showed a reliable to highly reliable internal consistency ($\alpha = 0.78-0.85$). Items are scored on a 5-point Likert scale with 0 = not at all, 1 = a little, 2 = somewhat, 3 = quite a bit, and 4 = very well. A total self-efficacy score can be computed by summing all items. A high score in this questionnaire shows high self-efficacy in the specific function in question.

2.5 Multilateral training program

The program was performed on-site at participating schools. Participants received multilateral training program for about 90 minutes, two extracurricular sessions per week, with a total of 24 training sessions. Each session was supervised by the primary investigator and conducted by two physical activity professionals for the developmental age and sports coaching specialists. Also, the mode, frequency, intensity, duration, and progression in an individual exercise log were recorded to ensure adequate training. Each training session started with a few minutes of psychoeducational activities that were also covered over the session; subsequently, a brief dynamic warm-up program, mainly consisting of callisthenics-type exercises, was performed; finally, a cool-down program, consisting of static stretching exercises, completed the session. The conditioning phase of the multilateral training program included cardiovascular endurance, resistance training, flexibility, and team-building activities. Flexibility was trained using both dynamic and static stretches, during the warm-up or cool-down phase of each training session. During the first four weeks, the training primarily consisted of preconditioning. From the fifth week onwards, we gradually increased the intensity and volume of the training. For effective training, the principles of overload and specificity were addressed (Haff & Triplett, 2016). The multilateral training program contents are shown in Table 1.

Table 1. Sample multilateral training extracurricular session by the experimental group.

Psychoeducational activities	Warm-up	Cardiovascular endurance	Resistance training	Team building	Cooldown
Topics included: Respect, goal-setting, self-concept and self-esteem, courage, resilience, bullying and peer pressure, self-care and caring for others, values, and optimism and hope. <i>Guidelines</i> Duration: 5 minutes Topics specifically covered during team building activities	Arm swings Trunk twisting High marching Stride jumping High knees Side bending Side stretching Skipping leg swings Backwards sprinting Lateral shuffles <i>Guidelines</i> Duration: 10 minutes. Perform each exercise for 60 s, 1 set	Running Walking Circuits Sprint intervals Agility (i.e., the ladder exercise) <i>Guidelines</i> Duration: gradually from 20 to 30 minutes. Intensity: 60 to 90% HRmax (220-age). Used HR rate monitor (Polar®) to ensure proper, effective, and safe training. Progression: increase duration before intensity	Jump squats Lunges Push-ups Pull-ups Curl-ups Half squats Long jumps Planks Medicine ball tosses <i>Guidelines</i> Duration: 10-20 minutes. 1-2 sets of 8-15 repetitions with 45 sec of slow walking between each exercise	Volleyball Basketball Handball Soccer Modified forms of the previous team games <i>Guidelines</i> Duration: about 20 minutes. Performed at the end of the conditioning before the cool-down. Characterized by a predominantly playful approach to encourage enthusiasm, socialization, and participation	Static stretching: Achilles' tendon/calf stretches Skier's stretches Quadriceps stretches Hurdler's stretches Straddle stretches Groin stretches Back stretches Archers. <i>Guidelines</i> Total duration: 10 minutes. Overload: stretch beyond resting length but not beyond pain-free ROM. Duration: 10-30 sec/stretch. Repetitions: 2-4, accumulate 60 sec per exercise. Progression: gradual increase in stretch duration or repetitions

2.6 Data Analysis

Statistical analyses were carried out using SAS JMP® Statistics (Version <14.3>, SAS Institute Inc., Cary, NC, USA, 2018). Data were presented as group mean values and standard deviations and checked for assumptions of normality that were confirmed with visual observation of univariate histograms, Q-Q plots and skewness and kurtosis values. A multivariate analysis of variance (MANOVA) was conducted to detect group differences at baseline. A two-way ANOVA (group (experimental/control) × time (pre/post-intervention)), with repeated measures on the time dimension, was conducted to examine the effect of the multilateral training on all examined variables. When 'Group x Time' interactions reached the level of significance, group-specific post hoc tests (i.e., paired t-tests) were conducted to identify the significant comparisons.

Partial eta squared (η_p^2) was used to estimate the magnitude of the difference within each group and interpreted using the following criteria: small ($\eta_p^2 < 0.06$), medium ($0.06 \leq \eta_p^2 < 0.14$), large ($\eta_p^2 \geq 0.14$). Effect sizes for the pairwise comparisons were determined by Cohen's d and interpreted as small ($0.20 \leq d < 0.50$), moderate ($0.50 \leq d < 0.79$) and large ($d \geq 0.80$) (Cohen, 1992). The standardized Cronbach's alpha coefficient (Cohen, Manion, & Morrison, 2011) was used as a measure of the reliability of the psychological tests (reliable: $0.70 \leq \alpha < 0.80$; highly reliable: $0.80 \leq \alpha \leq 0.90$). Statistical significance was set at $p < 0.05$.

3. Results

Four participants from the experimental group withdrew and thus fifty-six students completed the study. No injuries or other health problems were noted in the participants over the 12 weeks. All the participants of the experimental group showed satisfaction and reported wanting to continue practising physical activity afterwards. The groups did not differ significantly at baseline in all the dependent variables ($p = 0.926$). Table 2 shows the group changes in total resilience and self-efficacy and related subscales after 12 weeks.

Table 2: Changes in resilience and self-efficacy scales after 12-week multilateral training program

	Experimental group (n = 26)			Control group (n = 30)		
	Baseline	Post-test	Δ	Baseline	Post-test	Δ
CYRM-28 Resilience scales						
Individual capacities and resources	2.92 (0.52)	3.07 (0.52)+*	0.14 (0.15)	3.11 (0.70)	3.12 (0.65)	0.01 (0.24)
Relationship with primary caregiver	3.06 (0.65)	3.18 (0.59)+*	0.13 (0.20)	3.01 (0.66)	2.95 (0.63)	-0.06 (0.18)
Contextual factors	2.55 (0.67)	2.72 (0.64)+*	0.17 (0.23)	2.53 (0.84)	2.42 (0.66)	-0.10 (0.38)
Total resilience	2.84 (0.39)	2.99 (0.37)+*	0.15 (0.12)	2.88 (0.48)	2.83 (0.40)	-0.05 (0.16)
SEQ-C Self-Efficacy scales						
Academic self-efficacy	2.58 (0.70)	2.88 (0.59)+*	0.31 (0.74)	2.70 (0.65)	2.67 (0.61)	-0.03 (0.18)
Social self-efficacy	2.58 (0.64)	2.69 (0.55)+*	0.12 (0.33)	2.63 (0.61)	2.60 (0.62)	-0.03 (0.18)
Emotional self-efficacy	2.46 (0.51)	2.73 (0.45)+*	0.27 (0.45)	2.53 (0.57)	2.47 (0.57)	-0.07 (0.25)
Total self-efficacy	2.54 (0.33)	2.77 (0.26)+*	0.23 (0.28)	2.62 (0.27)	2.58 (0.29)*	-0.04 (0.12)

Notes: Values are presented as mean (\pm SD); Δ : pre- to post-training changes; +Significant 'Group x Time' interaction: significant effect of the intervention ($p < 0.05$). *Significantly different from pre-test ($p < 0.05$).

3.1 Resilience

Individual capacities and resources: A significant 'Time x Group' interaction ($F_{1,54} = 6.09$, $p = 0.017$, $\eta^2_p = 0.10$) and main effect of 'Time' ($F_{1,54} = 7.21$, $p = 0.001$, $\eta^2_p = 0.12$) were found, but no significant main effects of 'Group' was detected.

Relationship with primary caregiver: Statistical analysis revealed only a significant 'Time x Group' interaction ($F_{1,54} = 14.15$, $p < 0.001$, $\eta^2_p = 0.21$), whereas no significant main effect of 'Time' or 'Group' were detected.

Contextual factors: A significant 'Time x Group' interaction ($F_{1,54} = 10.25$, $p = 0.002$, $\eta^2_p = 0.16$) was found but not significant main effects of 'Time' or 'Group'.

Total resilience: A significant 'Time x Group' interaction ($F_{1,54} = 27.36, p < 0.001, \eta^2_p = 0.34$) and main effect of 'Time' ($F_{1,54} = 5.97, p = 0.018, \eta^2_p = 0.10$) were found, but no significant main effects of 'Group' was detected.

The post-hoc analyses revealed a significant increase in scores from pre- to post-test for experimental group in: Individual capacities and resources ($p < 0.001, d = 0.99$), Relationship with primary caregiver ($p = 0.002, d = 0.61$), Contextual factors ($p = 0.001, d = 0.73$) and Total resilience ($p < 0.001, d = 1.27$).

3.2 Self-Efficacy

Academic self-efficacy: A significant 'Time x Group' interaction ($F_{1,54} = 6.03, p = 0.017, \eta^2_p = 0.10$) was found, but no significant main effects of 'Time' or 'Group' were detected.

Social self-efficacy: A significant 'Time x Group' interaction ($F_{1,54} = 4.59, p = 0.037, \eta^2_p = 0.08$) was found but not significant main effects of 'Time' or 'Group'.

Emotional self-efficacy: Statistical analysis revealed a significant 'Time x Group' interaction ($F_{1,54} = 12.15, p = 0.001, \eta^2_p = 0.18$) and a significant main effect of 'Time' ($F_{1,54} = 4.42, p = 0.040, \eta^2_p = 0.08$), whereas no significant main effect of 'Group' was detected.

Total self-efficacy: A significant 'Time x Group' interaction ($F_{1,54} = 24.41, p < 0.001, \eta^2_p = 0.31$) and a significant main effect of 'Time' ($F_{1,54} = 11.19, p = 0.001, \eta^2_p = 0.17$) were found. No significant main effect of 'Group' was detected.

The post-hoc analyses revealed significant improvements from pre- to post-test for experimental group in: Academic self-efficacy ($p = 0.043, d = 0.41$), Social self-efficacy ($p = 0.041, d = 0.34$), Emotional self-efficacy ($p = 0.006, d = 0.60$) and Total self-efficacy ($p < 0.001, d = 0.82$). Also, the control group showed worsening after 12 weeks in Total self-efficacy ($p = 0.043, d = 0.35$).

4. Discussion

The purpose of this study was to examine the effects of 12 weeks of an extracurricular multilateral training program on the risk for male students to be involved in bullying (bully and victim), through the analysis of the resilience and self-efficacy variables. The results provided valid and reliable evidence that psychoeducational activities, combined with physical exercise training and team games, could be an effective alternative method to improve wellbeing including resilience and self-efficacy (Hartmann, 2003). Besides, interventions using this approach should promote an individual's ability to cope with the effects of bullying. Significant improvements were found in the experimental group for levels of the overall resilience and resilience sub-factors, as well as for total self-efficacy and self-efficacy subscales. Therefore, our hypothesis has been confirmed and the results agree with previous studies showing the effectiveness of the multilateral training program in promoting the prosocial attitudes (González et al., 2016) and transmission of values (Portolés & González, 2015), and in developing resilience and self-efficacy (Bandura, 2012; Schiraldi 2011) in young people. Furthermore, the non-competitive nature of the multilateral training could involve lower victimization rates caused by

bullying (Cascales & Prieto, 2019; Macarie & Roberts, 2010), and the higher social self-efficacy could allow resisting pressure to engage in risky behaviours (Ludwig & Pittman, 1999).

For the experimental group, positive changes in resilience showed a moderate to large effect size for all subscales and total resilience. This is an important achievement because students who report higher levels of resilience may be less likely to engage in aggressive behaviour or be bullied (Donnon, 2010; Lisboa & Killer, 2008; Rigby, 2008). Significantly improved relationships with primary caregivers have been particularly important, as family factors, including warm relationships and positive home environments, are associated with increased resilience to bullying (Bowes et al., 2010). It has been shown that resilience to bullying behaviours is improved when people can reveal their experiences to a family member (Rivers & Cowie, 2006). Furthermore, significant improvements in the resources individual, relational and contextual available support resilience competence in the face of adversity (Fischetti, Cataldi, Di Terlizzi, & Greco, 2019; Goldstein & Brooks, 2006; Kaplan, 2006; Naglieri & LeBuffe, 2006; Prince-Embury, 2007) and, thus, bullying (Bowes et al., 2010; Donnon, 2010; Greco, Cataldi, & Fischetti, 2019b; Lisboa & Killer, 2008; Rivers & Cowie, 2006; Sapouna & Wolke, 2013).

This study showed increases with a large effect size for total self-efficacy and with small to moderate effect for the subscales. However, the control group exhibited decreases for total self-efficacy with small effect size and this suggests that intervention had a greater effect on self-efficacy outcomes (Bandura, 2012). Since the victims of bullying report lower self-efficacy than non-victims (Moore & Woodcock, 2017b), the result that total self-efficacy improved for the experimental group and decreased for the control group suggests that the intervention could improve participants' abilities to cope with bullying (Ludwig & Pittman, 1999). Also, externalising and antisocial behaviours amongst youth are of pressing concern and considered a major public health problem (Krug, Mercy, Dahlberg, & Zwi, 2002), and the multilateral training could be an effective alternative intervention to for the externalising behaviours treatment. Our results agree with studies that suggested that motor and sports activities improve psychological (Fischetti, Latino, Cataldi, & Greco, 2019) and physical fitness (Fischetti & Greco, 2017; Greco, Cataldi, & Fischetti, 2019a), cognitive functions (Aschieri, 2016) and, specifically, executive functions in youth (Calzone & Di Santo, 2016; Diamond & Lee, 2011), and reduce externalising behaviours (Zhou et al., 2007).

Some limitations may limit the results of the current study. Given that the study only examined male participants from two high schools, the findings should be interpreted cautiously, as they may be the result of a localized effect. Also, as noted in the literature review, both bullying and resilience are complex constructs and lack an agreed academic definition. This presents questions in terms of whether the definitions used in the current study adequately operationalise the constructs. Future research should expand the definition of resilience and bullying. Finally, psychoeducational activities may have had a confounding effect on combined physical exercise training. However,

psychoeducational activity is naturally carried out by an experienced coach during physical and sports education sessions, so we can consider this limit irrelevant.

This study has some important strengths, i.e. it proposes an alternative approach to educational policy and suggests that instead of focusing resources towards eliminating bullying behaviours, the policy should focus on promoting mental health through developing wellbeing. Furthermore, the results obtained are of crucial relevance (i.e. moderate to large effect size) and reinforce those previously found in a few studies that relate bullying to physical activity and sport (Baena & Bosca, 2018; Holt, 2016). Future research should examine the multilateral training program's effects on different population samples and consider the students with a certain vulnerability (e.g., deficient gross motor skills) as it could diminish bullying (Bejerot, Plenty, Humble, & Humble, 2013; Healy, 2014).

5. Conclusion

Findings suggested that a multilateral training method based on psychoeducational activities, combined with physical exercise training and team games, may improve the resilience and self-efficacy in male adolescents, and make them less likely to engage in aggressive behaviour or be bullied. Evidence supports that anti-bullying policies are inconsistent; therefore, the multilateral training method should be considered as an alternative practice to improve individual ability to cope with the effects of bullying and an effective alternative to the anti-bullying failing approach of the institutions. Consequently, we must highlight the fact that the role of Physical Education professionals is noteworthy in the promotion of proactive educational strategies to prevent bullying through training sessions and competitions, which allow working in conflict resolution, i.e. avoiding sport competitive (Hand, 2016; López-Castedo, Álvarez, Domínguez, & Álvarez, 2018).

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Authors' contribution

Gianpiero Greco designed the study, carried out the statistical analysis, interpreted the data, wrote, and revised the manuscript. Elena D'Arcangelo interpreted the data and wrote the manuscript. Roberto De Ronzi designed the study, interpreted the data, wrote, and revised the manuscript. All authors contributed intellectually to the manuscript, read the manuscript, and approved the submission.

References

- Aschieri, P. (2016). Intelligenza motoria: Movimento o Movi...mente? (Motor intelligence: Movement or Move... mind?) *Athlon*, 35(1), 46-52. Retrieved from <https://www.fijklkam.it/media-fijklkam/rivista-athlon.html>.
- Baena, A. C. M., & Boscá, J. F. (2018). Acoso escolar y Educación Física: una revisión sistemática (Bullying in schools and Physical Education: A systematic review). *Retos: nuevas tendencias en educación física, deporte y recreación*, 34, 412-419.
- Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. *Journal of Management*, 38, 9-44.
- Bejerot, S., Plenty, S., Humble, A., & Humble, M. B. (2013). Poor motor skills: a risk marker for bully victimization. *Aggressive Behaviour* 39(6), 453-461. doi: 10.1002/ab.21489
- Bouman, T., van der Meulen, M., Goossens, F., Olthaf, T., Vermande, M., & Aleva, E. (2012). Peer and self-reports of victimization and bullying: Their differential association with internalizing problems and social adjustment. *Journal of School Psychology*, 50(6), 759-774.
- Bowes, L., Maughan, B., Caspi, A., Moffitt, T., & Arseneault, L. (2010). Families promote emotional and behavioral resilience to bullying: Evidence of an environmental effect. *Journal of Child Psychology and Psychiatry*, 51(7), 809-814.
- Calzone, C., & Di Santo, R. (2016). L'attività motoria e le funzioni esecutive (Physical activity and executive functions). *Athlon*, 35(1), 24-29. Retrieved from <https://www.fijklkam.it/media-fijklkam/rivista-athlon.html>.
- Cascales, J. Á. M., & Prieto, M. J. R. (2019). Incidencia de la práctica de actividad física y deportiva como reguladora de la violencia escolar. *Retos: nuevas tendencias en educación física, deporte y recreación*, (35), 54-60.
- Cohen, J. (1992). A Power Primer. *Psychological Bulletin*, 112(1), 155-159.
- Cohen, L., Manion, L., & Morrison, K. (2011). *Research Methods in Education* (7th ed.) (pp. 639-640). Oxford, UK: Routledge.
- Cohen, R., & Swerdlik, M. (2005). *Psychological testing and assessment*. Boston: McGraw Hill.
- Diamond, A., & Lee, K. (2011). Interventions shown to aid executive function development in children 4 to 12 years old. *Science*, 333, 959-964. <http://dx.doi.org/10.1126/science.1204529>.
- Donnon, T. (2010). Understanding how resiliency development influences adolescent bullying and victimization. *Canadian Journal of School Psychology*, 25(1), 101-113.
- Elias, M., Parker, S., & Rosenblatt, J. (2006). Building educational opportunity. In S. Goldstein & R. Brooks (Eds.), *Handbook of resilience in children* (pp. 315-336). New York: Springer.
- Farrington, P., & Ttofi, M. (2009). *School-based programs to reduce bullying and victimization*. Campbell Systematic Review, Oslo: Campbell Collaboration.

- Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods*, 39(2), 175-191.
- Fischetti, F., Cataldi, S., Di Terlizzi, P.G., & Greco, G. (2019). Multilateral methodology in physical education improves coping skills, resilience and physical fitness in drug addicts. *Journal of Human Sport and Exercise*. doi: 10.14198/jhse.2020.152.11
- Fischetti, F., & Greco, G. (2017). Multilateral methods in Physical Education improve physical capacity and motor skills performance of the youth. *Journal of Physical Education and Sport*, 17(Suppl 4), 2161-2168. DOI:10.7752/jpes.2017.s4223.
- Fischetti, F., Latino, F., Cataldi, S., & Greco, G. (2019). Gender Differences in Body Image Dissatisfaction: The Role of Physical Education and Sport. *Journal of Human Sport and Exercise*. doi: 10.14198/jhse.2020.152.01.
- Goldstein, S., & Brooks, R. (2006). Why study resilience? In S. Goldstein & R. Brooks (Eds.), *Handbook of resilience in children* (pp. 3–16). New York: Springer.
- González, J. I. Á., Ortega, F. Z., Garófano, V. V., Martínez, A. M., Sánchez, S. G., & Díaz, M. E. (2016). Actividad física de adolescentes: implicación de sustancias nocivas, modalidad practicada y familia. *Psicología Escolar e Educativa*, 20(1), 13-22. doi: 10.1590/2175-3539/2015/0201908
- Greco, G., Cataldi, S., & Fischetti, F. (2019a). Effectiveness of a Short After-School Intervention on Physical Fitness in School-Aged Children. *Ricerche di Pedagogia e Didattica. Journal of Theories and Research in Education*, 14(1), 143-164. doi: 10.6092/issn.1970-2221/9217
- Greco, G., Cataldi, S., & Fischetti, F. (2019b). Karate as anti-bullying strategy by improvement resilience and self-efficacy in school-age youth. *Journal of Physical Education and Sport*, 19(Suppl 5), 1863-1870. doi:10.7752/jpes.2019.s5276
- Haff, G. G., & Triplett, N. T. (Eds.). (2016). *Essentials of strength training and conditioning 4th edition*. Champaign, IL: Human kinetics.
- Hand, K. E. (2016). Creating a Bully-free Environment in Physical Education. *Journal of Physical Education, Recreation & Dance*, 87(7), 55-57.
- Hartmann, D. (2003). Theorizing sport as social intervention: A view from the grassroots. *Quest*, 55, 118–140.
- Healy, S. (2014). Preventing bullying in inclusive physical education practical strategies for teachers. *Palestra* 28, 42–46.
- Holt, N. L. (Ed.). (2016). *Positive youth development through sport*. New York, NY: Routledge.
- Kaplan, H. (2006). Understanding the concept of resilience. In S. Goldstein & R. Brooks (Eds.), *Handbook of resilience in children* (pp. 39–48). New York: Springer.
- Krug, E. G., Mercy, J. A., Dahlberg, L. L., & Zwi, A. B. (2002). World report on violence and health. *Lancet*, 360(9339), 1083-88. [http://dx.doi.org/10.1016/S0140-6736\(02\)11133-0](http://dx.doi.org/10.1016/S0140-6736(02)11133-0)

- Liebenberg, L., Ungar, M., & Van de Vijver, F. (2012). Validation of the child and youth resilience measure-28 (CYRM-28) among Canadian youth. *Research on Social Work Practice, 22*(2), 219–226.
- Lines, D. (2008). *The bullies: Understanding bullies and bullying*. London: Jessica Kingsley.
- Lisboa, C., & Killer, S. (2008). Coping with peer bullying and resilience promotion: Data from Brazilian at-risk children. *International Journal of Psychology, 43*, 711.
- López-Castedo, A., Álvarez, D., Domínguez, J., & Álvarez, E. (2018). Expressions of school violence in adolescence. *Psicothema, 30*(4), 395-400.
- Ludwig, K. B., & Pittman, J. F. (1999). Adolescent prosocial values and self-efficacy in relation to delinquency, risky sexual behavior, and drug use. *Youth & Society, 30*(4), 461-482.
- Macarie, I., & Roberts, R. (2010). Martial arts and mental health. *Contemporary Psychotherapy, 2*, 1–4.
- Minter, A., & Pritzker, S. (2017). Measuring adolescent social and academic self-efficacy: cross-ethnic validity of the SEQ-C. *Research on Social Work Practice, 27*(7), 818-826.
- Moore, B., & Woodcock, S. (2017a). Resilience to bullying: Towards an alternative to the anti-bullying approach. *Educational Psychology in Practice, 33*(1), 65–80.
- Moore, B., & Woodcock, S. (2017b). Resilience, bullying, and mental health: Factors associated with improved outcomes. *Psychology in the Schools, 54*(7), 689-702.
- Muris, P. (2001). A brief questionnaire for measuring self-efficacy in youths. *Journal of Psychopathology and behavioral Assessment, 23*(3), 145-149.
- Naglieri, J., & LeBuffe, P. (2006). Measuring resilience in children. In S. Goldstein & R. Brooks (Eds.), *Handbook of resilience in children* (pp. 107–123). New York: Springer.
- Olweus, D. (1993). *Bullying at school*. Oxford: Blackwell.
- Pellegrini, A. (2004). Bullying during the middle school years. In C. Saunders & G. Pyne (Eds.), *Bullying: Implications for the classroom* (pp. 177–202). New York: Elsevier Academic Press.
- Portolés, A., & González, J. (2015). Rendimiento académico y correspondencias con indicadores de salud física y psicológica. *Sportis, 1*, 164–181. doi: 10.17979/sportis.2015.1.2.1409
- Prince-Embury, S. (2007). *Resilience scales for children and adolescents: A profile of personal strengths*. Minneapolis: Pearson.
- Rigby, K. (2002). *A meta-evaluation of methods and approaches to reducing bullying in pre-schools and early primary school in Australia*. Canberra: Commonwealth Attorney-General's Department.
- Rigby, K. (2008). *Children and bullying: How parents and educators can reduce bullying at schools*. Carlton, Victoria: Blackwell.
- Rivers, I., & Cowie, H. (2006). Bullying and homophobia in UK schools: A perspective on factors affecting resilience and recovery. *Journal of Gay & Lesbian Issues in Education, 3*(4), 11–43.

- Sapouna, M., & Wolke, D. (2013). Resilience to bullying victimization: The role of individual, family and peer characteristics. *Child Abuse and Neglect*, 37(11), 997–1006.
- Schiraldi, G.R. (2011). *The Complete Guide to Resilience*. Ashburn, VA: Resilience Training International.
- Suldo, S. M., & Shaffer, E. J. (2007). Evaluation of the self-efficacy questionnaire for children in two samples of American adolescents. *Journal of Psychoeducational Assessment*, 25(4), 341-355.
- Ungar, M., & Liebenberg, L. (2011). Assessing resilience across cultures using mixed methods: Construction of the child and youth resilience measure. *Journal of Mixed Methods Research*, 5(2), 126-149.
- Zhou, Q., Hofer, C., Eisenberg, N., Reiser, M., Spinrad, T. L., & Fabes, R. A. (2007). The developmental trajectories of attention focusing, attentional and behavioral persistence, and externalizing problems during school-age years. *Developmental Psychology*, 43, 369–385. <http://dx.doi.org/10.1037/0012-1649.43.2.369>.

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