# PHYSICAL ACTIVITY AND BULLYING AND CYBERBULLYING: INNOVATIVE EDUCATIONAL PRACTICES

# ATTIVITA' FISICA E BULLISMO E CYBERBULLISMO: PRATICHE EDUCATIVE INNOVATIVE

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**ABSTRACT**
The increasing episodes of Bullying and Cyberbullying require the school to provide a concrete educational strategy. The purpose of this paper is to provide strategies aimed at preventing psychological or social problems. 100 students were assigned to an experimental group and a control group and were exposed to either a Classroom-based physical activity intervention or regular lessons. The results indicated that Physical Activity plays a mediating role between improving the emotional climate in the classroom and the acquisition of social skills and abilities in students.

I crescenti episodi di Bullismo e Cyberbullismo impongono alla scuola di fornire una concreta strategia educativa. Lo scopo di questo lavoro è quello di fornire strategie volte a prevenire problemi psicologici o sociali. 100 studenti sono stati assegnati a un gruppo sperimentale e ad un gruppo di controllo e sono stati esposti a un intervento di attività fisica in classe o a lezioni regolari. I risultati hanno indicato che l'attività fisica svolge un ruolo di mediazione tra il miglioramento del clima emotivo in classe e l'acquisizione di abilità e abilità sociali negli studenti.

**KEYWORDS**
Academic achievement; Pedagogy; School context; Didactic.
Successo scolastico; Pedagogia; Contest scolastico; Didattica.

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## 1. Introduction

In the analysis of the phenomenon of bullying in contemporary society, our social moment, the technological revolution, the changes, and uncertainties related to our era must certainly be considered. The onset of bullying and cyberbullying expands and develops in conjunction with the modes of communication with which it spreads. The increased accessibility and availability of the internet has led to a corresponding escalation in the frequency and duration with which adolescents and pre-teens engage in online activities (Ng, Chua, & Shorey, 2022; Sampasa-Kanyinga et al., 2020).

Bullying in school is a serious issue that can have significant and lasting effects on those involved. It can take many forms, including physical, verbal, and social aspects. Victims of bullying may experience emotional distress, low self-esteem, depression, anxiety, and even physical health problems. Schools and communities have a responsibility to address and prevent bullying through education, policies, and intervention programs. Creating a culture of respect, empathy, and inclusion is crucial in combating bullying (Haegele, Aigner, & Healy, 2020; Tzani-Pepelasi, Ioannou, Synnott, & Ashton, 2020). Students, teachers, parents, and administrators all play important roles in identifying and addressing bullying behavior. Cyberbullying, just like "offline" bullying, is an intentional form of abuse and oppression repeated over time, but which uses the internet and digital technologies to manifest itself. Digital aggressions can also be even more impactful: some online platforms guarantee anonymity, and this produces a loosening of many inhibitory brakes, weakens ethical qualms, amplifying the ferocity of aggression (García-Hermoso et al., 2020).

The onset of bullying and cyberbullying expands and develops in conjunction with the modes of communication with which it spreads. The increased accessibility and availability of the internet has led to a corresponding escalation in the frequency and duration with which adolescents and pre-teens engage in online activities (Castañeda-Vázquez et al., 2020; Holbrook et al., 2020).

The development and spread of social media that we have witnessed in the last ten years is one of the phenomena that is most significantly affecting the ways and times in which people interact (Sibold et al., 2020). The relationship between educational institutions and students is going through profound changes also generated by the rapid spread of the internet and social media, tools that, as recent surveys confirm, are increasingly part of the world of youth. As a consequence of these rapid transformations, it turns out that, while bullying was once largely confined to school, the potential and resources offered by social media today give bullies greater power of action: contact with potential victims is constant, without limits of time and space (Benítez-Sillero, et al., 2020; Nikolaou, & Crispin, 2022).

Schools and society must implement preventive measures: it is of fundamental importance, in fact, that public opinion recognizes the seriousness of

bullying and its consequences for the recovery of both young victims, who suffer deeply, and their abusers, who run the risk of embarking on paths characterized by deviance and delinquency (Alfonso-Rosa et al., 2020; Majed et al., 2022).

In this heterogeneous and articulated context, physical activity, for its contribution to social inclusion, to the improvement of self-esteem, as well as to the well-being of the body, plays an important role in the primary prevention of social distress in different age groups, with particular regard to the phase of youth development. The role of physical activity is expressed not only in enhancing athletic performance, but also in the integral growth of the individual, both from a social and personal point of view. As an innovative and inclusive strategy to introduce bullying and cyberbullying prevention strategies, promote the emotional climate of the class group, as well as a greater psychosocial balance of children and adolescents, physical activity in the classroom seems to be an effective approach to be implemented in the school context.

Therefore, the aim of the present work was to analyze the mediating role of a physical activity intervention carried out in the classroom in improving acceptance among peers and, consequently, reducing bullying and cyberbullying episodes.

## 2. Methods

*Study design*

This study presents a randomized controlled trial, in which a sample of participants was conveniently selected and then randomly assigned to either intervention or control groups. The randomization concerned the classes which were assigned to an Experimental or a Control group in order not to alter the normal course of the lessons. The research was carried out at a high school situated in the southern region of Italy. The research involved 12-week of intervention. Specifically, the experimental group (n = 50) and the control group (n = 50) were exposed to either a Classroom-based physical activity intervention integrated into math classes or regular math instruction. Each intervention involved two sessions of Classroom-based physical activity per week, with each session lasting 20 minutes and taking place during normal school hours. Assessments were conducted both before and after the completion of the intervention programs.

*Participants*

One hundred adolescents, ranging from 13 to 15 years of age (with a mean age of 12.85 and a standard deviation of 0.36), were chosen as a convenient sample for the scholarly investigation. The selection process was based on voluntary enrollment, with specific criteria that included all third-year students. The set criteria were established to ensure the sample would be suitable for meeting the

research needs: students in their initial year, pupils from specified educational establishments, individuals in good physical condition, proficient in executing an exercise routine, and willing to abstain from other physical activities for the duration of the study. A priori power assessment was carried out, with a predetermined type I error rate of 0.05 and a type II error rate of 0.05, resulting in a statistical power of 95%. The assessment revealed that a minimum of 50 participants would be necessary to detect moderate "Time x Group" interaction effects (f = 0.25). To account for potential dropouts, larger sample sizes were recruited.

*Procedures*

The program of intervention was implemented within the confines of the school gymnasium during regular school days. Assessment of standardized motor evaluation tests and Mathematical performance was conducted before and after the intervention period to establish the initial level of the participants and detect any variations compared to the baseline.

Participant underwent the assessments simultaneously daily under identical experimental settings. The students received individual evaluations, with each task being comprehensively explained before initiation. Precautions were implemented to guarantee that the children were unaware of the study's objectives or the experimental arrangement, aiming to lessen any potential bias that could undermine the credibility of the data. The participants were instructed to wear suitable sportswear to reduce discrepancies in the testing process and were advised to avoid excessive physical activity 24 hours before each assessment session. The assessments and both intervention programs were managed, supervised, and carried out by two proficient Physical Education instructors certified by the Italian Ministry of Education.

*Measures*

*Motor tests*

The evaluation tests for physical fitness comprised four measurements: the Standing long jump test assesses the lower-body horizontal explosiveness, the Push-up test measures upper body strength and endurance, and the Sit and reach test evaluates the extensibility of the hamstring muscles and lower back.

These assessments were selected due to their ease of implementation, minimal time requirement, and basic equipment needs, making them particularly suitable for educational settings. Moreover, these tests were conducted both pre- and post-intervention programs.

*Florence Bullying/Victimization Scale*

The Florence Bullying/Victimization Scale consists of two sections, one for the perpetrators of bullying and one for the victims. Each section consists of 14 items, which respondents must respond to using a five-step scale where 1 indicates never; 2 once or twice; 3 once or twice a month; 4 once a week and 5 several times a week. The possible responses are elaborated according to two indices: presence, absence and gravity (which coincides with a close repetition in time of the bullying).

Florence Cyberbullying/Cybervictimization Scale

The Florence Cyberbullying/Cybervictimization Scale is a scale structured in order to evaluate the phenomenon of bullying carried out through the use of new communication tools offered by the development of the *Internet*. The *Scale* consists of a first part that lists the tools that can be used to implement cyberbullying behaviors and a second part, divided into two sections, which respectively describe the ways in which electronic bullying can be implemented and/or suffered. The scale consists of a total of 36 *items*, divided into two subscales of eighteen *items* each.

*Training intervention*

The intervention for exercise training was carefully structured to include specific segments: an initial phase dedicated to improving flexibility (3 minutes), a central part involving moderate-to-vigorous aerobic exercise (15 minutes), and a concluding cool-down period (2 minutes) geared towards maintaining a safe heart rate. The warm-up regimen consisted of various activities such as stationary marching, walking jacks, Knee to chest, Heel digs, arm circles, shoulder rolls, Knee lifts, Butt kicks, lunges, Side steps, and High knees. In contrast, the cool-down phase featured static exercises like neck stretches, behind-head tricep stretches, standing hip rotations, Hamstring stretches, Hip flexor stretches, side stretches, and butterfly stretches.

Each scheduled break was strategically incorporated to occur within and between science classes, coinciding with the implementation of a nutritional education program.

A typical session of an active classroom intervention included: i) planned breaks interspersed throughout educational tasks; ii) educational tasks that involved physical activity; iii) the use of benches, standing desks, floor spaces, or a combination of these to facilitate movement between different work areas; iv) participation in educational activities conducted outdoors.

*Statistical Analysis*

Statistical analyses were conducted using IBM SPSS Statistics, version 26.0 (2019 SPSS Inc., IBM Company). The presentation of data involved group mean (M) values and standard deviations (SD), with an examination of variance homogeneity through Levene's test. The normality of variables was assessed using the Shapiro-Wilk test. Initially, differences between groups at baseline were identified through an independent sample t-test, followed by a two-way ANOVA (experimental/control group) x time (pre/post-intervention) with repeated measures on the time dimension to assess the intervention's impact on all variables. Upon establishing significance in the "Group x Time" interactions, specific post hoc tests (paired t-test) were conducted for each group to make meaningful comparisons. The effect size within each group was measured using Partial eta squared ($\eta 2p$), with distinctions for small ($\eta 2p < 0.06$), medium ($0.06 \leq \eta 2p < 0.14$), and large ($\eta 2p \geq 0.14$) effects. Furthermore, Cohen's d was computed for each analysis, with thresholds indicating small ($d = 0.20$), medium ($d = 0.50$), and large ($d = 0.80$) effect sizes. Statistical significance was determined at a threshold of $p \leq 0.05$.

## Results

The two cohorts of subjects were administered the designated treatment protocols. There was no notable contrast between the experimental and control clusters in terms of age, anthropometric traits, or educational attainment at the outset ($p > 0.05$). Tabular data presenting the comprehensive statistics for the entire participant pool can be found in Table 1.

**Table 1.** Changes after CBPA intervention.

| | **Experimental Group (n =50)** | | | **Control Group (n = 50)** | | |
|---|---|---|---|---|---|---|
| | **Baseline** | **Post-test** | **Δ** | **Baseline** | **Post-test** | **Δ** |
| **Motor Test** | | | | | | |
| Standing long jump | 1.51 (0.06) | 1.54 (0.05) †* | 0.03 (0.02) | 1.49 (0.06) | 1.48 (0.08) | -0.01 (0.06) |
| Push-up test | 6.36 (1.85) | 13.62 (3.50) †* | 7.26 (2.51) | 5.82 (1.89) | 5.66 (1.91) | -0.16 (1.18) |
| Sit and reach test | 4.82 (2.32) | 9.28 (3.10) †* | 4.46 (1.65) | 4.94 (2.23) | 3.56 (2.62) | -1.38 (1.32) |
| **AC-MT 11-14 Test** | | | | | | |
| Florence B/V | 71.94 (1.25) | 63.48 (0.88) | -8.46 (2.11) | 72.90 (6.43) | 73.16 (6.59) | 0.26 (1.08) |
| Florence C/C | 81.80 (1.56) | 73.60 (1.19) †* | -8.20 (2.74) | 82.28 (5.88) | 82.68 (6.09) | 0.40 (1.94) |

Note: values are presented as mean (± SD); Δ: pre- to post-training changes; †Significant 'Group x Time' interaction: significant effect of the intervention ($p < 0.001$). *Significantly different from pre-test ($p < 0.001$).

*Motor Tests*

Statistical analysis for two-factor ANOVA allowed us to observe a substantial "Time x Group" interaction for motor testing. The values were as follows: Standing long jump test ($F1.98_{=}$ 23.52; $p< 0.001$; $\eta 2p = 0.69$ - large effect size), Push-up test ($F1_{,98}$ = 356.52, $p< 0.001$; $\eta 2p = 0.78$ - large effect size) and Sit and reach test ($F1_{,98}$ = 379.46; $p< 0.001$; $\eta 2p = 0.66$ - large effect size). In addition, the post-hoc analysis found that EG showed a significant increase from pre- to post-test in Standing long jump ($t = 9.86$; $p< 0.001$; $d = 1.39$ - large effect size), Push-up test ($t = 72.90$; $p< 0.001$; $d = 3.64$ - large effect size) and Seat and reach test ($t = 20.42$; $p< 0.001$; $d = 2.88$ - large effect size). The control group reported no significant change ($p > 0.05$).

*Florence Bullying/victimization Scale*

Statistical analysis for two-factor ANOVA showed a significant 'Time x Group' interaction also for the Florence Bullying/victimization Scale ($F1_{.98} = 674.88$; $p < 0.001$; $\eta 2p = 0.65$ - large effect size). Post-hoc analysis revealed a significant improvement in score for this variable ($t = -28.33$; $p < 0.001$; $d = 4.07$ - large effect size) in the intervention group. No significant changes were found for the control group ($p > 0.05$).

*Florence Cyberbullying/Cybervictimization Scale*

Statistical analysis using a two-way ANOVA showed a considerable 'Time x Group' interaction for the Florence Cyberbullying/Cybervictimization Scale ($F1_{.98} = 327.07$; $p< 0.001$; $\eta 2p = 0.76$, large effect size). As a result, a post hoc analysis revealed that EG achieved a significant decrease in the decision questionnaire from pre- to post-test ($t = 21.15$; $p< 0.001$; $d = 2.99$ large effect size). After the intervention, the CG reported no significant changes ($p > 0.05$).

**Discussion**

The aim of the present study was to analyze the mediating role of a physical activity intervention carried out in the classroom on school violence and bullying and cyberbullying phenomena, in classes with students who showed signs of psychosocial maladjustment.

As part of this work, the results show that the physically active classroom program was effective in improving peer acceptance and, as a result, reducing bullying and cyberbullying incidents. In contrast, regular classes that did not involve any motor practice were less effective in achieving implications that matched the goals set in this study. The results obtained from the present work therefore allow us to conclude that physical activity represents an important factor in the

correlation between self-esteem and the reduction of violent behaviors among adolescents.

An important element of analysis concerned the frequency with which the participants in the study declared to engage in or to have suffered abusive behaviors. By dividing the sample according to the class attended and analyzing victimization and bullying behaviors across the board, it was possible to note that the phenomenon is more present in boys attending the first and second year of secondary school with an almost homogeneous gender difference, slightly preponderant towards the male gender but growing strongly in the female gender (Benítez-Sillero, Ortega-Ruiz, & Romera, 2022). What has just been described outlines a worrying general picture because, according to several authors, the less time elapses between one bullying and another, the more the phenomenon assumes worrying proportions. This happens because the perpetuation over time allows the phenomenon to become chronic, favoring in a more precise and meaningful way the distinction between the roles of bully and victim.

In addition, the results obtained after the administration of the intervention of physically active lessons it was possible to observe a strong decrease in the frequency of prevaricating acts. We hypothesized that this outcome was directly related to the increase in self-esteem scores obtained following participation in the proposed motor activities. In fact, several studies showed a significant increase in self-esteem as a consequence of physical activity (Gilani, & Dashipour, 2017; Kim, & Ahn, 2021; Ouyang et al., 2020). This result is probably due to the fact that children, in the context of physical activity, can experience different psychological mechanisms deriving from learning a new skill, which are also reinforced by the very fact of wanting to successfully engage in the activity to which they are dedicating their time and effort (Estévez, Cañas, Estévez, & Povedano, 2020).

In light of this evidence, the importance of students' participation in physical activity is fundamental for the promotion of a classroom climate that promotes empathy and reduces bullying behaviors. The relevance of the figure of the teacher and his actions in the face of bullying situations is therefore evident. The teaching style and methodology adopted by teachers influence the emergence or prevention of bullying behaviors in students, as they influence the satisfaction or frustration of their basic psychological needs for autonomy, competence, and relationship. Research has shown that meeting these needs correlates with positive outcomes that affect students' personal growth and psychological well-being.

In this regard, several studies show that properly directed physical activity provides psychological benefits aimed at encouraging the emergence of positive emotions that act as a deterrent against bullying situations and that instead accompany friendship, mutual help, and inclusion.

Although this research provides significant support for the positive relationship between physical activity and bullying and cyberbullying behaviors,

some limitations of this study deserve consideration. Initially, it is important to note that the study is constrained by its focus on students from a single educational institution. Consequently, generalizing the results to students from different schools or diverse backgrounds may not be appropriate. Additionally, the study's small sample size (N=100) led to challenges in participant recruitment, posing another limitation. Another constraint was the absence of an assessment of the lasting impacts of physical activity on cognitive functions. Furthermore, the study's narrow age range and data collection from a single time point limit its scope. Therefore, future research should aim to investigate similar variables on a more diverse sample encompassing students from elementary, middle, and high schools. Nonetheless, the findings obtained can offer valuable insights for future investigations. The strength of this research lies in its effective approach to enhancing physical fitness, academic achievement, and psychosocial aspects. In this sense, physical activity would have the potential to promote students' personal responsibility, empathy, and positive social behaviors, proving to be a useful resource for preventing bullying.

**Conclusions**

In the Italian and international school context, the various strategies aimed at dealing with the phenomenon of bullying and cyberbullying have been implemented through numerous projects aimed at promoting legality starting from the classroom context. The results achieved may provide significant indications for future studies. In fact, to the best of our knowledge, this is the first study to use physically active classes as a strategy to reduce bullying. These first results, in fact, show a worrying spread of the phenomenon of bullying in schools at a global level but, at the same time, represent an encouraging element in light of the positive results obtained following the program of physically active lessons.

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