

## Self-esteem in physically active middle school students

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### Abstract:

The present research examined the effect of physical fitness on self-esteem of pre-adolescent children. Students performed the MOTORFIT tests and filled IPAQ-C and Self-Esteem questionnaires. According to the level of the physical fitness we evaluated the self-esteem. Results showed no gender differences, while differences for the level of physical fitness was found. In particular, participants who performed better the MOTORFIT test reported a higher self-esteem compared to less physical fit participants. However, a discrepancy emerged when the self-esteem was analysed as a function of the physical activity reported where no differences emerged between the groups. In conclusion, our results provided an effect of physical activity on self-esteem through objective measures.

**Key words:** physical activity, pre-adolescent, psychosocial characteristics.

### Introduction

In the last years, the lack of physical activity in people, and especially children and adolescents is increasing so much that several organised have been tried to develop program in order to increase the physical activity.

Indeed, the physical activity might increase several human functions (D'Isanto, 2016). People who regularly practice sports and recreational activities might increase their physiological functions as well as they can produce an enhancement of the cognitive functions and psycho-sociological characteristics (Biddle & Asare, 2011; Hallal, Victora, Azevedo, & Wells, 2006; Dale, Vanderloo, Moore & Faulkner, 2018).

In particular, research that investigated the relation between physical activity and physiological aspects showed how the physical activity might promote the wellbeing. Indeed, physically active people are less affected by cardiovascular diseases, obesity and type II diabetes (Tremblay, Inman & Willms, 2000; Wannamethee & Shaper, 2001; Zhu, Jacobs, Schreiner, Yaffe, Launer, 2014). Moreover, physical activity seems to promote mental health and some cognitive functions (Biddle & Asare, 2011; Biddle, Ciaccioni, Thomas, & Vergeer, 2019). However, even if the influence of physical activity in the human aspects seemed more relevant in adulthood than in childhood, the likelihood of developing in adulthood some diseases is negatively correlated to physical activity performed in childhood and adolescent-hood (Tremblay et al., 2000; Trudeau, Laurencelle, Tremblay, Rajic & Shephard, 1998).

Moreover, physical activity seems to be a useful tool for the development of personality traits than can be important for the entire life of the person and for the entire society (D'Elia, 2019, Gaetano, 2012). For instance, team and individual sports might help children to improve the psychosocial abilities and to better manage the stressful situation (Boone & Leadbeater, 2006; Gore, Farrell & Gordon, 2001), nevertheless this was not found by Galambos and colleagues (2004). However, the results are not ubiquitous, and researchers have been investigating how the physical activity affect some psychosocial characteristics. For example, as reported in some reviews (Biddle & Asare, 2001; Hallal et al., 2006; Dale et al., 2018), scholars investigated the effect of physical activity on anxiety and self-esteem. For both the variables, results indicated an effect of physical activity, but the effect sizes were usually small and often the quality of research was poor. In the update review performed by Biddle and colleagues (2019) researchers did not find any relation between level of physical activity and psychosocial features. An independent investigation (Russo, Nigro, Raiola & Ceciliani, 2019) reported that students who participated in an extra physical activity program reported a Higher self-esteem than the control group, nevertheless due to the design of the experiment involved, authors were not able to understand whether the extra physical activity had a role in the self-esteem.

However, in general, a high complex mechanisms and different variables could be involved in the modulation of psychosocial characteristics (Di Tore et al., 2016).

In the present study we investigated whether the self-esteem on pre-adolescent children of the second class in a middle school of Rimini vary as a function of the physical fitness of the students. Physical fitness was tested through the MOTORFIT battery test and we controlled the data with International Physical Activity Questionnaire for Children (IPAQ-C, Kowalski, Crocker & Kowalski, 1997).

In particular, we expected that children who performed better in MOTORFIT test (Perotta, Corona, & Cozzarelli, 2011) have a higher score in Rosenberg questionnaire. Moreover, participants who have a high score in MOTORFIT tests should report to be more physically active and performed higher scored IPAQ-C questionnaire.

Gender was analysed in order to understand whether there were differences between females and males in self-esteem and quantity of physical activity reported. In particular, we hypothesised differences between females and males in self-esteem and we assumed male participants should report to be more physically active than females. In order to control the data, we expected that self-esteem could vary as a function of the IPAQ-C score. In particular, we also expected participants that reported to be more physically active should report a higher self-esteem compared to their counterpart less active.

## Methods

### *Participants*

Seventy-two (38 females) middle school students participated in the experiment. They were students of a second and third class and their age was between 12 and 14 years old.

Students completed IPAQ-C (Kowalski et al., 1997) and the Rosenberg Self-Esteem (Rosenberg, 1964) questionnaires and performed the MOTORFIT tests (Perotta et al., 2011). The research was approved by the Ethical Committee of University of Bologna.

### *Questionnaires*

Pre-adolescent, during the class hour, filled the Rosenberg Self-esteem (1994) and IPAQ-C (Kowalski et al., 1997) questionnaires under the supervision of the teachers and one researcher involved in the investigation. The Rosenberg questionnaire examines the self-esteem of the students while IPAQ-C examined how much pre-adolescents were active during the previous week. The score for each test was assigned following the guidelines of the two questionnaires.

Moreover, in order to control the data with objective measure (i.e. PAI), we divided the sample according to the IPAQ-C score in two groups below and above the median of the IPAQ-C score.

### *Physical tests*

A series of physical tests were performed by the young students. In particular, the MOTORFIT tests (Perotta et al., 2011) were involved in the research. They were the 10 m shuttle run, the Cooper, the sit-up, the long jump and the flexibility test. Local muscle endurance for upper limb test was excluded due to the absence of the suitable equipment. Tests were performed in the physical education hours under the supervision of the teacher and one researcher.

A dummy variable (e.g. 0; 1) was assigned for each physical test. 0 or 1 was assigned when the student performed the test below or above the average score of the MOTORFIT manual for age and gender, respectively. Thus, the sum of each test indicated the general fitness of the students. Consequently, we create an index, the Physical Activity Index. The group was divided by the median of the PAI scores according to the class to which they belong in High-PAI group and Low-PAI group. High-PAI students were 37 (23 females) while Low-PAI students were 37 (15 females).

### *Data Analysis*

Statistical analysis was conducted with R Studio software (version: 1.1.463, [www.rstudio.com](http://www.rstudio.com)). We run ANOVA to analyse whether IPAQ-C and Rosenberg scores vary as a function of the level of physical fitness (2 levels: High-PAI and Low-PAI) and gender (2 levels).

In order to control the self-esteem score we performed another ANOVA analysis with independent variable the IPAQ-C dichotomized for students who reported to be more physically active and pre-adolescent who reported to be less physically active (High and Low-IPAQ-C score).

## Results

### *Physical activity questionnaire*

The physical activity questionnaires, as expected, revealed that high PAI student reported to be more physically active than the low PAI ( $F(1,68) = 17.08, p = .0001$ ). In particular, the score of High-PAI students was  $2.95 \pm 0.68$  while the score of Low-PAI score was  $2.39 \pm 0.60$ . Single factor gender was significant ( $F(1,68) = 14.29, p = .0003$ ) where males reported to be more physically active than females ( $2.86 \pm 0.76$  VS  $2.49 \pm 0.60$ ). Whereas interaction PAI X Gender was not significant ( $F(1,68) = 0.45, p = 0.50$ ).



Fig. 1 showed the difference in Self-Esteem score between High-PAI and Low-PAI students ( $p < .05$ )

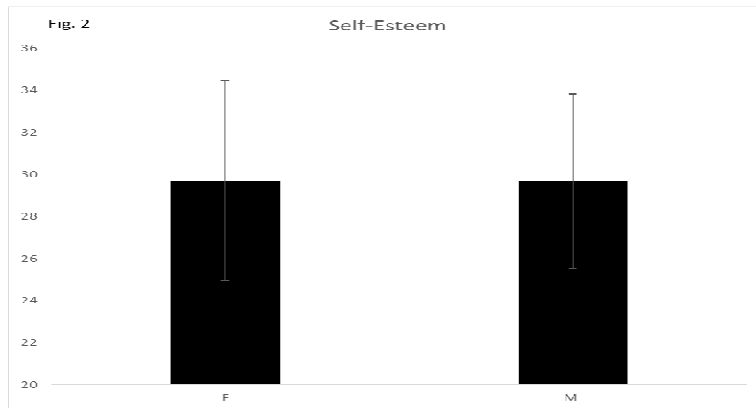


Fig. 2 showed the females and males Self-Esteem score ( $p > .05$ )

*Self-Esteem questionnaire*

Self-Esteem questionnaire analysis revealed significant differences between High-PAI and Low-PAI ( $F(1,68) = 4.34, p = .041$ ) where High-PAI participants reported a higher self-esteem compared to Low-PAI students ( $30.16 \pm 4.16$  VS  $28.48 \pm 4.35$ ). No effect for gender ( $F(1,68) = 0.26, p = .61$ ) was found as well as the interaction PAI X gender ( $F(1,68) = 0.63, p = .43$ ) was not significant. A separate analysis with independent variable IPAQ-C dichotomized did not reveal differences between the groups ( $F(1, 70) = 1.41, p = 0.24$ ). In particular, High-IPAQ-C score was  $30.3 \pm 4.9$  and Low-IPAQ-C score was  $29.1 \pm 3.9$ .

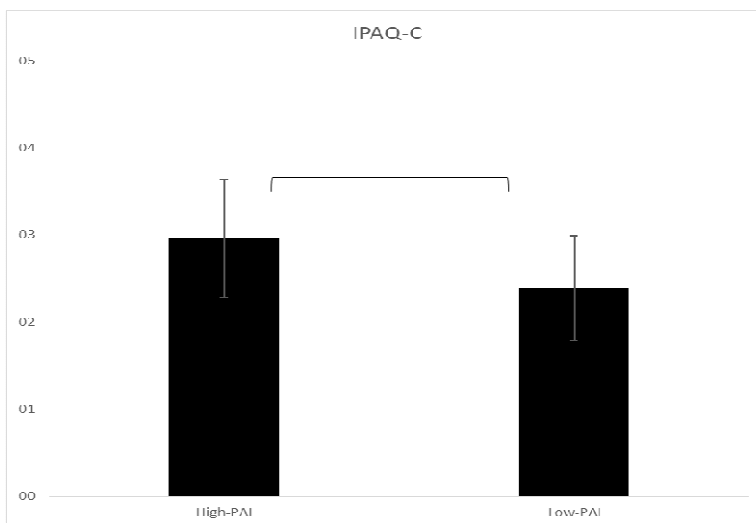


Fig. 3 showed differences in IPAQ-C score between High-PAI and Low-PAI pre-adolescent ( $p < .05$ )

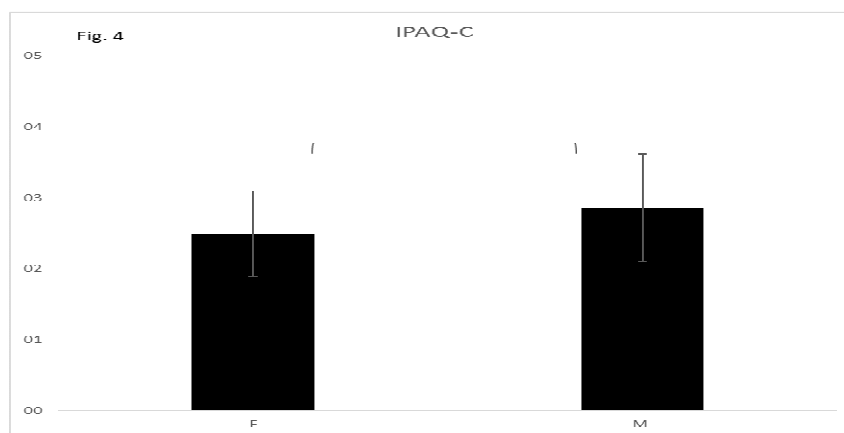


Fig. 4 highlighted differences in IPAQ-C score between females and males ( $p < .05$ )

### Discussion

Physical activity may be one of the most important tools to develop the entire human aspects in order to promote the well-being and mental health. However, on the side of psychological characteristics, even if the positive relation between physical activity and psychosocial characteristics, the results of the research are lack of quality (Sibley & Asare, 2011). The aim of the present research was to investigate the positive relation between physical fitness and psychosocial features such as self-esteem. Previous studies have shown that physical activity can modulate different human aspects, but according to some reviews the results are not crystal clear, and the investigations are often characterised by low quality.

Results of the present research confirmed some hypotheses. Specifically, students who performed better in the MOTORFIT test (Perrotta et al., 2011) reported to be more physically active than counterpart less fit. Moreover, we expected differences in the physical activity reported between males and females where even in this sample, females reported to be less active than male students. The present results are in line with the literature where females seemed less active than males and this can be due to sociocultural aspects (Markes, Ekelund & Sardinha, 2016). For what concerns the self-esteem our hypotheses were partially confirmed. In particular, gender differences were expected. Usually males should have high self-esteem when compared to females and this is often associated with sociocultural differences. However, in this sample, the self-esteem did not vary as a function of gender. Physical fitness instead seems to be able to increase the self-esteem and this can be due to different aspect. We can assume that participants who performed the MOTORFIT (Perrotta et al., 2011), should practice some sport or recreational activity. Thus, be together with playmates and the effect of training can increase the awareness and pleasantness in ourselves and awareness.

However, our Self-Esteem results were not confirmed with the analysis with IPAQ-C questionnaire. High-IPAQ-C score was slightly higher than Low-IPAQ-C, but not significant. This discrepancy can be due to different reasons. As often happens in reported measure (Prince, Adamo, Hamel, Hardt, Gorber & Tremblay, 2008; Stewart, Jackson, Ford, & Beaglehole, 1987), it is possible to think that participants with high self-esteem could report to be more physically active than they really are. Thus, objective and subjective and/or implicit measures should be involved in this kind of experiment (Farnham, Greenwald & Banaji, 1999).

### Conclusion

The research provides evidence on the relation between physical fitness and self-esteem. However, further studies are needed to complete understand this complex phenomenon. Different variables can influence the self-esteem, thus, different variables such as the type of sport practiced, or other sociocultural factors should be involved in the next investigations. Moreover, it could be useful to examine whether the self-esteem vary as a function of physical activity and age. Moreover, we suggested to include objective and subjective measures in order to better examine and explain the results obtained in these kinds of research.

### Conflict of Interest

The authors declared that there is no conflict of interests in this research.

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