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Self and physical activities in early adolescence: an action research with middle-school students

Simona Nicolosi^a*, Rosaria Schembri^a, Salvatore Pignato^a, Alessandra Lo Piccolo^a,
Pietro Mango^a, Francesco Sgrò^a, Mario Lipoma^a

^a Faculty of Physical Activities and Wellness Sciences, Kore University of Enna, Enna, Cittadella Universitaria 94100, Italy

Abstract

Few studies have so far examined the relation between Self concept, the variables linked to identity development and physical activity. The action-research wants to investigate the effects of specific training, based on the physical activity practice, on Self concept, physical and social self-esteem, self-efficacy, interpersonal psychological adjustment and meta-cognitive processes. Pre-adolescents from 11 to 14 years of age were involved in physical activities and educational itineraries. Results show that physical fitness may provide more positive social feedback and recognition from peer groups, and this will subsequently lead to improvement in an individual's self-image.

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1. Introduction

Few studies have so far examined the relation between Self (physical and social), the variables linked to identity construction and physical activity (Annesi, 2007; Lidor, 2004; Theodosius & Papaioannou, 2006).

The psychological well-being resulting from exercise or sport is now generally accepted both in scientific literature and common belief. The improvement of mood, energy and body image, greater stability and confidence in the physical Self perception, greater perceived interpersonal and physical competence in sport or exercise, are some of the physical, cognitive, emotional and social correlates in physical activity.

During adolescence, the transitional period from childhood to adulthood, when individuals try to adapt to all the physical, cognitive and social changes, exercise and sport - especially 'structural' ones (Ciairano, 2008) - can have a very important role in the developmental acquisition of this particular age. All these changes can make the adolescent experience very strong emotional events which can lead to a significant reduction of self-esteem. An area of self-esteem that can be mainly affected during adolescence is the physical self-esteem, which includes both body attractiveness and physical competence perception (Fox, 1997). The results of a study by Bowker (2006), showed the mediating role of physical self-esteem in the relationship between sports participation and global self-esteem.

In 1956 Piaget had already stated the positive influence of psychophysical learning on intellectual activities. In a meta-analytical review by Etnier et al. (1997) the results of 134 studies were collected which examined cognitive

* Simona Nicolosi. Tel: +39.0935.536638
E-mail address: simona.nicolosi@unikore.it

functioning through different measuring systems. The results led to a single answer: the improvement of cognitive performance due to exercise, especially long-term. Shepard (1997) compared the efficacy of an increased curriculum of physical activity on the school performances of an experimental group of pupils of a primary school and a control group continuing with the usual program. The experimental group did the same number of weekly hours of but less of other subjects. The results of the experiment showed that the educational performance of the students of the experimental group were the same or improved in those subjects whose number of hours had diminished. In the study of Sallis et al. (1999) it was showed that students who do extra hours of PE with certified PE specialists do not consequently have worse school results.

The relationship between metacognitive processes and physical activities has also been investigated. In the SPARK program (Sport, Play & Active Recreation for Kids), projected by Marcoux *et al.* (1999), physical education in primary school was promoted. The curriculum created had as objective that of favoring the maintenance and generalization of those abilities acquired through physical activity, such as auto monitoring, selection of objectives, planning and problem solving. The results showed that participants underwent not only physical changes (body mass index) but also cognitive and social changes.

Lidor (2004) performed an experiment on the use of different strategies taught by a Physical Education teacher to a group of preadolescents within the school curriculum. The results showed that teaching specific strategies in sport and in metacognitive behavior would favor the accuracy of students' performances.

Ommundsen (2003) examined the relationships between implicit self-theories and metacognitive self-regulation strategies with regard to learning in physical education classes in a sample of adolescents aged 13 to 17. Self-regulation includes the development of strategies, regulation efforts and search for help. The results showed the important relation between motivational and cognitive characteristics to provide a full comprehension of the self-regulation skills of students in PE learning.

2. Objectives

The present action research has been proposed to investigate the impact of specific training - based on the practice of physical activities – on the self concept (physical and relational), specific psychological dimensions involved in the construction of identity (self-esteem, self-efficacy, interpersonal adjustment) and on problem solving (problem-solving strategies and metacognition). The overall goal was to organize educational courses for integrated, on the one hand, to strengthen the capacity for choice, self-regulation in problem solving and achieving common goals and, secondly, to support the definition of the Self in preadolescence.

A second objective involved the establishment of a working group to work. This objective is closely linked to the process of change involved in the trail and turned to the pre-adolescents and teachers involved in the action research. The working group consists of researchers from the Faculty of Physical Activities and Wellness Sciences of the Kore University of Enna and psychologists, experts in physical education and sport, and physical education and math teachers of the middle schools involved. The working group planned educational activities and has monitored the temporal learning and behavior of participants, with changes and adjustments during the implementation process. Moreover, the working group has calibrated the learning goals, skills proximal harmonized heuristics and educational needs, creating a methodological proposal differs from traditional teaching.

This action may eventually have more impact in early vocational guidance, through a new phase that includes specific objectives related directly to the formation of choice (Di Nuovo & Nicolosi, 2003).

3. Method

3.1. Sample

Have joined the project 153 preadolescents attending two middle schools (Enna, Italy). The age of the participants during the Phase I (base line), is between 11 and 13 years ($M = 11.29$, $SD = 0.52$, $Mdn = 11.00$). During

the readings of the first stage of the project (school year 2008-09) participants attended the first grade of middle school.

3.2. Instruments

In the first and third phases of the project, the tools used were the Interpersonal Adjustment Questionnaire (QAI) for middle school students (Di Nuovo, 1998): the subscales of the questionnaire are: Ambient and Family Pressure, External Locus (in relationship engagement), tendency to depression, tendency to psicosomatization; the Physical Self-esteem Scale in the Multidimensional Self-Concept Scale – MSCS (Bracken, 1993); the Self Image Scale for the investigation of Self-Concept – VIS (Magnano & D Nuovo, 2010); the General self-esteem and self-efficacy scales (Bandura, 1977; Schwarzer, 1993); the Mini Locus of Control Test (Perussia & Viano, 2008); The Italian version of the Physical Self Description Questionnaire (PSDQ) (Marsh, 1996; Meleddu et al., 2002) in a single administration in post test.

For the evaluation of the metacognitive aspects the three scales of the QMS (Study Method Questionnaire) (Cornoldi, 2001) were used; the scale for the analysis of the study planning, the scale for the ability to self evaluate during study and the evaluation scale of metacognitive attitude in the learning process.

3.3. The intervention

The research project was divided into three phases. In the first phase (pre-test), there has been a pre-evaluation of the variables investigated (Physical and social self-concept, physical and global self-esteem, self efficacy, interpersonal adaptation and metacognitive aspects of organization and planning study activities). During the first stage has been set up operations group work that had the task of reflecting on the results of initial assessments to plan, implement and monitor activities. In the second stage (intervention), participants in the research, pre-teens ages 12 to 14 years who participated in the first phase, were involved in structured pathways for problem solving, mathematical, logical, visual-spatial and motor. In the third phase (post-test), were conducted surveys finals and final assessment.

The project was implemented in the second semester of the 2009-10 school year. The learning units have been carried out during the hours of physical education in the school gym involved. The meetings were aimed at achieving the increased of the following areas:

- Identity: awareness of body and gesture, gender differences, culture and the meanings it carries, the relationship between the individual and the group, reason and emotion, recognize and treat the different intelligences of each; acquire the skills, abilities and skills related to specific attitudes;

- Design: Develop the ability to make informed choices and take responsibility to promote a spirit of initiative and the taste of the company, to develop creativity and cooperative learning;

- Knowledge: understand the systems of "meaning" to use metacognitive strategies to increase motivation and self-esteem, acquire knowledge of their own and others' cognitive styles, best interests, memory, attention and concentration.

- Strengthening and generalization of coping skills and problem solving: understanding the problem, building strategies for the solution, seeking alternatives, refinement of thought sequentially (sequential thinking) that aim (means-end thinking) and causal (causal thinking) discovery of analogies, monitoring and evaluation of the solution.

The learning units have been planned with the teachers, based on levels of learning achieved by students and the results of the pre-assessment. In each unit, team games were made that included exercises and logical-mathematical engines. Within each session, the boys took turns in the solution of the problems or observation of their companions. At the end of each meeting, they were rated the activities, highlighted the positive elements and provide feedback on critical issues and unresolved problems.

4. Results and Discussion

Results are presented in two sections: Phase I (pre-test) and phase III (post-test). First, we present preliminary results concerning total group and differences between gender. Second, pre-post test findings are presented both in experimental and control groups.

In the *Phase I (pre-test)*, participants presented average levels of body esteem and general, average levels of self-efficacy, a high degree of interpersonal adaptation and a positive self-evaluation. However, there were in lower levels of body esteem in girls than boys. The results show, for what concerns the bodily self, the emergence of a significant gender difference on the concept and image that people perceive their own body, in line with previous research (Harter, 1997, cit. in Bowker, 2006). Another finding is related to a specific dimension of locus of control, externalism, significantly lower than in girls. Girls tend, in fact, to attribute the causes of events (successes and failures) to themselves, rather than outside. The reading of this result may be twofold: on the one hand, indicates a most important trend for girls to give themselves to the control of events, on the other hand, a lack of balance in this evaluation can lead, especially in the presence of low self-esteem, to devalue its impact to the environment, to avoid the difficulties rather than face them or choose the easiest targets because they believed in your door.

Even, in areas of metacognitive and self-organization, the picture obtained can give rise to a double interpretation. In fact, it would seem that, compared to girls, boys to behave more "strategic" is the organization of the study afternoon is a view of a check, which tends to assess in advance the ease or difficulty of a task. This could be due, however, as well as specific problems of girls in the organization of the study, also from their greater "accountability" (less externalities) in completing tasks or in wanting to achieve better results in tests for learning.

In the *Phase III (post-test)*, results show that the experimental group has significantly higher average in environmental psychological adjustment subscales after the intervention, in the final assessment. After the intervention, Ambient and Family Pressure subscale (A&F) is significantly lower ($p=0,04$), even if for the girls A&F is more important than boys ($p<.001$). Averages lower in External Locus of Control subscales (Fatalism, Dependency by others and Externalism) in causal attribution of success or failure. Comparisons pre-post intervention, there is a significant difference in Tendency to depression subscale, that decreases significantly in boys ($p=0,05$). Results show that as far as Self Image is concerned, in girls involved in the project, the overall vision of Self-Concept is better than the beginning ($p = .05$). Girls shows a better sense about the weight PSDQ factors (but not with a statistical significance).

Table 1. Correlation among PSDQ factors and other variables in environmental and individual psychological adjustment

Environmental and individual psychological adjustment	Physical Self Description Questionnaire Factors										
	Health	Coordination	Physical activity	Body fat	Sport skills	Global Physical	Appearance	Strength	Flexibility	Endurance	E
<i>Inter-personal psychological adjustment</i>											
Ambient and family pressure	-0,10	-0,06	-0,11	-0,36	-0,23	-0,41	-0,27	-0,33	-0,00	0,10	.
External Locus (in relationship engagement)	-0,14	0,21	0,24	0,01	-0,03	-0,19	0,05	0,07	0,22	0,30	.
tendency to depression	-0,09	-0,03	-0,05	-0,21	-0,30	-0,48	-0,29	-0,07	0,04	0,05	.
tendency to psicosomatization	-0,36	0,09	0,05	0,08	0,16	-0,06	-0,01	-0,05	0,05	0,15	.
<i>Intra-personal psychological adjustment</i>											
Self-esteem	0,15	0,18	0,22	0,36	0,24	0,48	0,47	0,35	0,23	-0,01	0,
Physical Self-esteem - MSCS	0,13	0,58*	0,36	0,58*	0,52	0,72***	0,66***	0,63***	0,52	0,33	0,
Self-efficacy	0,05	0,42	0,30	0,29	0,30	0,32	0,30	0,28	0,32	0,18	.
<i>Locus of control (in causality of events)</i>											
Fatalism	0,15	-0,35	0,01	-0,22	-0,23	-0,37	-0,29	-0,42	-0,27	-0,12	.
Dependency by others	-0,01	-0,32	-0,10	-0,20	-0,30	-0,35	-0,08	-0,33	-0,08	-0,05	.
Externalism of control	-0,06	-0,31	-0,06	-0,13	-0,28	-0,16	0,00	-0,01	-0,22	-0,26	.
Total locus of control	0,16	-0,50	-0,17	-0,19	-0,39	-0,44	-0,22	-0,43	-0,31	-0,18	.
<i>Self-concept – VIS</i>											
Self Image	0,10	0,09	0,04	0,38	0,22	0,43	0,39	0,20	0,10	-0,15	0,

* $p<.05$ ** $p<.01$ *** $p<.001$

As far as Study Method (QMS), the experimental group shows a significant difference in question "It happen I have to do homework after the dinner" in pre-post comparison ($p=.02$). In experimental group, there is a positive correlation between in Self Image (see Table 1) and the question "I can understand a mistake (when I do my

homeworks)" ($p = .05$). Physical Self-esteem of Bracken's MSCS is significantly related with several subscales of PSDQ: Coordination, Obesity, Global Physical, Appearance, Strength and Esteem (see Table 1). As far as Esteem, the PSDQ subscale, there is a positive correlation with General Self-esteem, Dependency by others and Positive Perception of Self Image (VIS) (see Table 1). In girls, Physical Self-esteem is related with General Self-esteem ($p < .001$), Dependency by others, External Locus of Control and Positive Perception of Self Image ($p < .05$); General Self-esteem related with Appearance and Global Physical.

5. Conclusions

Participating in activities linked to sport and problem solving didactic, during adolescence, can play a protective role in decreased self esteem and help the development of cognitive and metacognitive processes. In accordance with previous researches (Marcoux et al., 1999; Sallis et al., 1999), a program structured on specific physical activities could determine significant positive changes in interpersonal adaptation, general self-esteem and specific dimensions of physical self, which are indispensable variables in psycho-physical changes in early adolescence.

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