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MOTOR PERFORMANCES IN RELATION TO PERCEIVED PHYSICAL SELF-EFFICACY, ENOJOYMENT AND BMI IN PRIMARY SCHOOL CHILDREN

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Abstract:
Physical efficiency is an important health indicator for children and adolescents. The increase in overweight and obesity in childhood is a dangerous determinant of physical fitness development. This study aimed to evaluate and compare motor performances, perceived self-efficacy and enjoyment in relation to BMI in primary school children. The sample consisted of 2,623 children (F: 1,300; M: 1,323) divided into three groups according to gender and BMI differences (Normal-weight vs Over-weight vs Obese). In addition to descriptive statistics (M ± SD), ANOVA 3 (group, normo-weight vs overweight vs obese) was performed x 2 (gender), to highlight differences between groups ($p<.05$). Physical fitness perceived physical self-efficacy and enjoyment were assessed with motor test (*SLJ; 6 MWT; 10x4; MBT*) and two self-report questionnaires, i.e. PACES and PPAS_C. Results showed a strong relation between BMI and motor performances, perceived self-efficacy and enjoyment in both males and females. Overweight and obese children showed lower motor performances compared to the Nw group of students ($p<.05$). Furthermore, the scores of perceived self-efficacy and enjoyment of the Ow-Ob group are lower than those of the Nw group ($p<.05$). Findings reveals that children perceived self-efficacy and enjoyment are crucial for motor development and promoting active lifestyles.

Keywords: physical fitness; obesity; primary school; self-perception; enjoyment

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1. Introduction

Motor activities contribute to the development of motor skills, necessary precursors of correct lifestyles and for participation in sport; various and different motor experiences increase the quantitative and qualitative opportunities to learn further motor skills and develop motor skills, generating a circular process that feeds itself through daily motor activities. Several studies have confirmed the contribution of physical activity to the physical growth, personal development and the promotion of children's health. According to Ortega et al. (2008) physical efficiency is an important health indicator for children and young people, since: (1) the levels of cardiorespiratory efficiency (aerobic / anaerobic endurance) are mainly associated with abdominal adiposity; (2) cardiorespiratory and muscle efficiency are associated with the occurrence of cardiovascular disease risks; (3) the improvement of muscle efficiency (strength) and speed have positive effects on skeletal development; (4) the increase in both cardiorespiratory and muscle efficiency are recommended for children and young people with various diseases to improve the quality of life; (5) improving cardiorespiratory efficiency has positive effects on depression, anxiety, mood and self-esteem and is associated with good school performance.

Unfortunately, the decline in usual physical activity levels also generates a consequent decline in motor performance and related factors. Recently Faigenbaum et al. (2018), highlights that a large percentage of children and adolescents in the world do not reach the 60-minute of moderate to vigorous (MVPA) daily physical activity, with a consequent reduction in the levels of physical efficiency in young developmental age. The triad of physical activity in children (Faigenbaum, 2018), identifies three distinct, but closely related factors: exercise deficit disorders, pediatric dynapenia, motor illiteracy (physical illiteracy). A dangerous circular process is thus generated: subjects with low MVPA levels will be less inclined to participate in motor activities, even free / unstructured, and this determines a lesser suitability for the practice of physical or sports activities that entail the achievement of a state of joy, associated with movement (joy of movement).

This is associated with a progressive reduction in the motor repertoire of motor skills and the consequent levels of individual coordinative development. Today's children are weaker, slower and heavier than their peers of the past, with an increasing tendency to develop physical, psychosocial and cognitive health problems, especially in school age. The proposals from international organizations (WHO, 2018), observed for the practice of habitual physical activities both of a quantitative and qualitative type (how much and how to carry out these activities) also differentiated according to the control band various types of physical activity. In general, WHO can be said to have purchased 150 minutes per week of moderate intensity activity for adults and 60 minutes of moderate to vigorous daily activity for the developmental age (WHO, 2018). Despite global needs, however, the decline in physical activity levels in recent years doesn't seem to stop.

According to Garrido-Miguel et al. (2019) the prevalence of overweight and obesity combined in European children aged 2 to 13 years changed from 20.6% during 1999 to 2006, to 21.3% during 2011 to 2016. The highest prevalence was in Italy (16.8%) and Malta (14.2%).

School programs that include curricular physical education and extracurricular motor and sports activities, produce positive results on promoting further physical activity outside of school and contribute to increasing the time that children and young people spend actively and reduce the time spent in sedentary habits (Messing, 2019). Not only that, the contexts that emphasize positive experiences (family, school, neighborhood), characterized by fun, variety and wide participation, conducted by qualified teachers, informed parents, can significantly influence the character of these physical activities and increase the probability to realize the potential benefits of participation.

However, integrated interventions in different educational contexts (school, free time, sport) are needed to analyze cause-effect relationships between different factors: socio-environmental determinants related to daily physical activity, reduction of children's physical activity levels, increase in overweight and obesity in developmental age, cognitive and social development (Wright et al., 2016; Cotton et al., 2017; Verjans-Janssen et a., 2018).

The school setting is fundamental for the development of physical fitness and motor learning. Physical education offers many and different opportunities for practicing structured physical activity, promoting the development of motor abilities during childhood and adolescence. Recent findings show that many of these benefits will not necessarily be the result of participation in the activities but the effects could be mediated by the nature of the interactions between students and their teachers, parents and adults of reference to school, in the family in the socio-cultural context (Lonsdale et al., 2013; Bailey, 2006). Faigenbaum et al. (2020) describes the complex system of factors related to participation in active play, exercise and spots activities in children and adolescents, the so-called "F-words" (family, facilitators, facilities, force, fitness, function, fun, felling and future), underline the relationship among socioecological, physiological and psychological correlates of physical activity.

Therefore, the concept of physical literacy has to be considered in its entirety: it includes the psychomotor, cognitive and affective aspects, as well as the learning processes (Lee et al., 2019).

Fundamental Movement Skills (FMS) play a key role in program of physical literacy, developing physical competences (Edwards et al., 2017). Barnett et al. (2017) consider fitness as a key target for interventions, highlighting the positive associations with FMS self-perception.

The proposal of motor programs that balance the recommended amount of MVPA with the quality of the experience of movement is necessary. In fact, a greater experience of movement, allows to reach a greater level of physical literacy, which will have positive repercussions on health, in the short and long term (WHO, 2018).

The opportunities and environmental conditions for motor activity interact with the biological substrates of growth and maturation, thus determining the repertoire of children's motor skills (skills, knowledge and behavior expressed in a specific didactic context).

Motor experiences take place in various contexts including home, school, neighborhood play area; all this contributes to the development of motor patterns through the variability of practice and to the learning of motor skills which are the essential basis for promoting health in different ways (Lubans et al., 2010; Barnett et al., 2016).

The increase in overweight and obesity in childhood is a dangerous determinant of physical fitness development. Rauner et al (2013) analyzed the relationship between physical activity and overweight and between fitness and overweight highlighting that obesity is inversely related to physical activity. School-based program can improve actual and perceived physical abilities, body image, and PA in overweight and obese children (Morano et al., 2020).

All studies reveal inverse relationships between physical efficiency and overweight. Mediation effects have been noted in the interrelation between body mass index (BMI), fitness and physical activity. Excessive body weight would be the cause or effect of low physical activity and low fitness levels. Cattuzzo et al. (2014) confirmed that: motor skills levels are inversely proportional to body weight (27 of 33 studies), there is a positive association between motor skills and good cardiorespiratory efficiency (12 of 12 studies) and between motor skills and musculoskeletal functions (7 out of 11 studies).

The relationship between motor skills and joint flexibility has not been well defined. The study highlights that the development of motor skills during childhood can directly and indirectly influence the health status linked to physical efficiency and can serve to encourage the development of long-term health-related results in children and adolescents. Unfortunately, studies from several countries warn that a consequence of the reduction in physical activity levels among children and adolescents is the decline in motor performance (Tomkinson & Olds, 2007; Ekelund et al., 2011) which helps to reduce preventive and protective effects of physical activity.

Furthermore, it has been shown that low levels of physical activity and physical efficiency in adolescence are associated with low levels of physical activity and physical efficiency in adulthood, prerequisites for a sedentary life (Huotari et al., 2011).

2. Perceived Self-Efficacy

According to Bandura's (1997), self-efficacy is the confidence that the individual places in their ability to perform a task with a positive outcome through the expression of skill (Bandura, 1997). The proposal of a motor task solicits in the person the perceived self-efficacy (or the perceived self-efficacy), that is the trust that includes in the ability to successfully master a successful skill (Bandura 1997). Physical self-concept is related to

competence, such as strength, physical fitness, body perception or sport activities (Babic et al., 2014; Bardid et al., 2016).

Physical activity and sport practice engagement are closely related to psychological factors and intrinsic motivation (Sierra-Diaz et al., 2019), in order to organize effective programs to promote active and healthy lifestyle in Physical Education classes.

According to Tietjens et al. (2018), both physical fitness and skills (commonly considered as perceived motor competence) are critical for the development of perceived competence. Motor competence refers to a person's ability to perform a wide range of motor skills, including the movement coordination and control underlying a particular motor outcome that are necessary to manage everyday tasks (Robinson et al., 2015).

According to Stodden et al. (2008) the development of motor skill competence is a primary underlying mechanism that promotes engagement in physical activity. Actual motor competence and optimal levels of perceived motor competence seem to play a key role in engaging children and adolescents in physical activity and sports (Estevan, Barnett & Estevan, 2018). A combination of high actual and perceived motor competence is related to higher physical activity and lower weight status (Meester et al., 2016; Colella et al., 2009). Khodaverdi & Stodden (2015) demonstrate the link between physical (actual motor competence and aerobic fitness), behavioural (PA) and psychological development (perceived motor competence) in childhood. Measures related to motor competence, motivation and positive affect work in an integrative manner to produce differences in PA and subsequent health outcomes in children (Cariney et al., 2019).

3. Enjoyment

Perceived self-efficacy and enjoyment are mediation factors for learning motor skills (Lubans et al., 2008). Physical education contributes to the educational process of the child, promotes the learning of motor skills, the development of perceived self-efficacy and enjoyment (Hills et al. 2014). Enjoyment and perceived self-efficacy are strictly related: pleasant and fun experiences during motor activity promote awareness of the practice of motor activities in different contexts and at different ages (Robinson et al., 2015).

Examining growth trajectories of PA and enjoyment, Yli-Piipari et al., (2012) found that adolescents with highest levels of intrinsic motivation and moderate to high levels of extrinsic one, reached highest levels of enjoyment and physical activity.

According to the Motivational Model in PE (Gråstén & Watt, 2017), intrinsic motivation had positive relations with enjoyment, knowledge, and performance, while BMI was negatively linked with relatedness and self-competence.

A recent meta-analysis suggests that school-based physical activity interventions can be effective in increasing physical activity enjoyment in children and adolescents (Burns, Fu & Podlog, 2017). According to Cameron et al. (2017) increasing positive affect also increases motivation and performance in relation to physical activity. Overweight

and obese children showed less positive emotions than normal weight ones (Gil-Madrona et al., 2019).

Even if enjoyment during physical activity is as an essential condition for encouraging sport practice, developing positive effects, and diminishing the negative ones and sedentary behavior in boys and girls (Gil-Madrona et al., 2019; Bai et al., 2017), findings reveals autonomous motivation and enjoyment in PE were not significant predictors of later PA (Timo et al., 2016).

4. Material and Methods

4.1 Aim

The aim of this study is to (a) evaluate and compare motor performance of resistance, strength and speed in relation to the body mass index (BMI) of a sample of children, (b) to examine perceived self-efficacy and enjoyment in relation to the BMI and motor performances.

4.2 Participants

The sample consisted of 2,623 primary school children (F: 1,300; M: 1,323), ranged from 8 to 10 years (Table 1). Children recruited, participated at *Sbam*! (*Health Wellness Food Movement at school*), a multicomponent regional project aimed at primary schools in Apulia Region, in the south of Italy. The project has been promoted and financed by the Regional Administration and had provided for the collaboration of the University of Foggia, the CONI (Puglia regional committee) and local health authorities. The program was structured to implement measures to reduce sedentary habits and prevent childhood overweight and obesity, based on (a) correct eating habits promotion , (b) motor skills learning during curricular physical education lessons, (c) develop of active transport through pedibus, (d) recreative sport and socialization through fair play, (e) active lifestyles to reduce sedentary habits and support physical activity during leisure time (Colella, 2014).

Table 1. Sample

Gender	*N*	*Group*	*Age*	*Height*	*Weight*	*BMI*
	804	Nw	9,20 ± 0,45	1,36 ± 0,07	31,08 ± 12,93	16,66 ± 6,13
Female	336	Ow	9,19 ± 0,43	1,39 ± 0,07	40,04 ± 4,98	20,80 ± 1,24
	160	Ob	9,1 ± 0,32	1,41 ± 0,06	50,62 ± 7,46	25,53 ± 2,89
	718	Nw	9,24 ± 0,44	1,37 ± 0,06	31,25 ± 4,95	16,68 ± 2,01
Male	379	Ow	9,26 ± 0,45	1,40 ± 0,06	41,04 ± 5,13	21,00 ± 1,30
	226	Ob	9,23 ± 0,43	1,41 ± 0,07	50,47 ± 6,87	25,39 ± 2,24
Total	2623					

4.3 Measures

Participants were divided into three groups according to gender and BMI differences (Normal-weight vs Over-weight vs Obese). Anthropometric data (height and weight)

and those relating to motor development and psychological factors (physical self-efficacy and enjoyment) were carried out. According to Cole et al., (2000) participants were divided by gender and group differences: normal-weight (Nw), overweight (Ow) and obese (Ob) children (Cole, 2000).

The following motor tests were assessed (Ruiz et al., 2010): standing long jump (SLJ) and medicine ball throw (MBT) to evaluate strength of the lower and upper limbs, shuttle run 10 × 4 (10 × 4) and 6 min walk test (6 min WT) to evaluate resistance.

Enjoyment during PA practice was assessed using the Physical Activity Enjoyment Scale (PACES), (Carraro, Young, & Robazza, 2008). The 16-item scale is scored on a 5-point Likert scales, with responses ranging from 1 (Disagree a lot) to 5 (Agree a lot). A high score on the positive scale (PACES_P) and a low score on the negative (PACES_N) indicate a high pleasure in physical activity (only PACES_P was considered in this research).

The PSP_C (Physical Self Efficacy Scale for Children) utilizes six items representing strength, speed, and coordinative abilities. The items are structured in response scales having a 1- to 4-point format. Children are required to think of themselves when playing, performing physical education exercises, or when involved in sporting activities. For each item, participants are asked to choose one of the four sentences best representing their personal feelings. Therefore, the total test score can range from 1 to 24. High scores would indicate a high self-perception of physical ability, whereas low scores would reflect a low self-perception.

4.4 Statistical Analysis

Descriptive statistics (M ± SD) and ANOVA 3 (group, normo-weight vs overweight vs obese) were performed x 2 (gender), to highlight the differences between groups. The significance index was set at p <.05. Pearson correlation's coefficient was carried out for dependent variables (Physical Self Efficacy and Enjoyment) by sex and BMI categories. Statistical significance was set at $p < .05$. Data were analyzed using "SPSS-Statistical Package for the Social Sciences" (ver. 25.0).

5. Results

A summary of participants' descriptive statistics is provided in Table 2. Overweight and obese children, showed lower means in all motor test (except in MBT), compared to normalweight. Data revealed a progressive decline in perceived self-efficacy and enjoyment from Nw to Ow and Ob children, in both male and female.

Table.2 Measures

Gender	*N*	*Group*	*SLJ*	*10x4*	*MBT*	*6mWT*	*PSP_C*	*Paces_P*
	804	Nw	1,18±0,22	13,80±1,79	4,08±0,95	656,81±118,28	18,33±3,70	40,93±5,64
Female	336	Ow	1,11±0,21	13,99±2,05	4,27±0,98	630,59±98,31	18,30±3,18	40,55±5,77
	160	Ob	1,00±0,23	14,63±2,40	4,32±1,11	587,54±121,65	17,71±3,42	39,79±7,26
	718	Nw	1,30±0,25	13,06±1,93	4,69±1,09	676,52±129,55	20,04±3,26	40,61±6,99
Male	379	Ow	1,21±0,20	13,54±1,53	5,08±1,12	659,44±108,58	19,45±3,10	41,13±5,60
	226	Ob	1,10±0,26	14,24±2,44	5,01±1,42	607,56±130,12	17,96±4,75	38,77±9,96
Total	2623							

Table 3 indicates bivariate correlations between physical measures, respectively in male and female.

Statistically significant correlations among variables were generally low (r = .09–.20) to moderate (r = .34–.55). BMI influenced about all measures. Higher positive correlations were carried out between SBJ and MBT both in male and female group; SBJ and MBT were also negatively related to 10x4 in Ow and Ob group (male and female).

Table.3 Pearson's Bivariate Correlations Among Measures

Male				**Female**			
Nw				**Nw**			
	MBT	10x4	6Mwt		MBT	10x4	6Mwt
SBJ	,558**	,096**	,433**	SBJ	,520**	,114**	,447**
MBT		0,65	,399**	MBT		,117**	,371**
10x4			,182**	10x4			,230**
Ow				**Ow**			
	MBT	10x4	6Mwt		MBT	10x4	6Mwt
SBJ	,504**	-,204**	,341**	SBJ	,410**	-,359**	,236**
MBT		-,181**	,347**	MBT		-,107*	,106
10x4			-,002	10x4			,052
Ob				**Ob**			
	MBT	10x4	6Mwt		MBT	10x4	6Mwt
SBJ	,485**	-,263**	,421**	SBJ	,326**	,039	,233**
MBT		-,252**	,178**	MBT		-,204**	,193*
10x4			,72	10x4			,95

*= p<.05; **= p<.001

Physical Self Efficacy and Enjoyment (PACES_P) were correlated with above all motor tests (Table 4 and 5). There was a significant indirect effect of psychological correlates on motor abilities and physical performance, related to BMI.

Table. 4 Pearson's Correlates For Physical Self-Efficacy With Other Variables

Variables	Male			Female		
	Nw	Ow	Ob	Nw	Ow	Ob
SBJ	,265**	,251**	,267**	,266**	,242**	,259**
MBT	,249**	,181**	,339*	,341**	,168**	,255**
10x5	,085*	-,76	-,226**	,099**	-,103	-0,75
6Mwt	,194**	,197**	,049	,218**	-,106	-0,99

*= p<.05; **= p<.001

Table.5 Pearson's Correlates For PACES_P With Other Variables

Variables	Male			Female		
	Nw	Ow	Ob	Nw	Ow	Ob
SBJ	,197**	,180**	,206**	,200**	,079	,177*
MBT	,197**	,134**	,279**	,302**	,070	,233**
10x5	,118**	-,017	-,154*	,183**	,012	-,149
6Mwt	,182**	,201**	,031	,220**	,130	-,002

*= p<.05; **= p<.001

6. Discussion

Studies highlight and confirm that motor performances of normal weight children is higher than that of overweight and obese peers. Overweight and obese children show lower motor performance than normal weight peers in all tests except in the test of the throwing of the medicine ball (kg2). In addition, there is a decline and a significant difference between the scores of the nw subjects vs. those reported by the ow-obese subjects.

The analysis of the results highlights moderate relationships between SBJ and MBT in all groups, regardless of gender, with higher values in the Normal Weight group. The 6-minutes test is positively correlated with the SBJ and MBT, with higher values in the Nw group (both boys and girls). The results suggest that a higher distance is positively correlated with lower BMI.

Statistical analysis highlights a positive association between MBT and Self Efficacy and enjoyment in the Obese groups, while 10x4 speed test evidences the least correlations with psychological correlates.

This suggests that activities that required rapid body movements, high intensity or endurance activities, are less appreciated and accepted by obese children. No significant statistical correlation was found in the female Ow group.

Robinson et al. (2015) in a recent review underline: (a) a positive relationship between motor competence and physical activity across childhood; (b) a strong

association between motor competence and motor performances (especially in endurance and muscular strength) from childhood to adolescence, and (c) motor competence can be considered a precursor and a consequence of weight status, highlighting an inverse relationship across childhood and adolescence. Vitali et al. (2019) showed that muscular strength scores was positively correlated with BMI, PA levels, and enjoyment.

The studies confirm the research carried out by Deforche et al. (2003) which assessed several factors of physical efficiency and physical activity of boys and girls divided into two groups, obese and non-obese. Obese subjects had lower performance in all tests that required horizontal or vertical elevation of body mass (standing long jump, sit-up, shuttle run) compared to normal weight peers. In contrast, obese subjects showed more handgrip strength. Also in the study carried out by Carvalho Dumith et al. (2010) on a sample of 519 students (ages 7 to 15 years), it emerges that the boys reported higher performances than the girls in all tests (sit-and-reach, standing long jump, pull-up, medicine ball throw, run of 9 minute run test, 20 m speed) except for flexibility and that the group of normal-weight students showed superior performance vs the overweight-obese group in all tests, except in sit-and-rich and in throwing the medicine ball. The endurance test (9 minutes run test) had the strongest association with body weight. Higher values of the body mass index have been associated with the decline in physical efficiency, regardless of age. The results of the study by Joshi et al (2012) on a sample of 7230 students (aged between 5 and 17 years), confirm previous studies regarding motor performance and physical activity levels in relation to BMI. The Fitnessgram protocol was used and, regardless of gender differences, boys in overweight-obese conditions show lower motor performance, compared to normal-weight students, particularly in motor tasks that require the movement of the body horizontally and vertically. In general, participants with a normal body weight have the highest levels of Health Fitness Zone (HFZ), followed by overweight and obese subjects. Gontav & Ruzdija (2014) also showed that adolescents (N = 2228, male and female) with a high body mass index have a lower percentage of muscle mass and obtained lower results in the tests of evaluation of muscle strength, speed and coordination and a low aerobic capacity, compared to normal weight peers. Groups with a high body mass index achieved results similar to the normal weight group only in terms of flexibility and greater in terms of static force.

The study of Manley et al. (2014) examined the relationships among self-efficacy, physical activity, aerobic fitness, and body composition (11-13 years). Results evidenced a weakly positive correlation between self-efficacy, physical activity, and aerobic fitness and weakly correlated inverse relationships between self-efficacy, physical activity, aerobic fitness and BMI were found. Findings suggest that those with optimal BMI levels have higher self-efficacy, physical activity and aerobic fitness levels. Nagy et al., (2017) examined the acute effects of intermittent physical activity on psychological mood and enjoyment in elementary school-age children, in relation to weight status. Results evidenced that overweight/obese children reported lower mood scores compared with healthy weight children. Enjoyment was significantly higher from sedentary to active conditions ($p = .02$). The study of Rodriguez-Ayllon et al. (2018) examined the

associations of physical fitness (i.e. cardiorespiratory fitness, muscular strength, and speed/agility) with psychological distress and psychological well-being in overweight/obese pre-adolescent children. Results evidenced that upper-body muscular strength was negatively associated with stress and negative affect; absolute lower-body muscular strength was negatively associated with negative affect. Cardiorespiratory fitness, expressed by the last completed lap, and relative upper-body muscular strength were positively associated with optimism. Finally, absolute upper-body muscular strength was positively associated with self-esteem independently of sex and weight status, and absolute lower-body muscular strength was also positively associated with self-esteem. According to the authors, increased levels of physical fitness, specifically muscular strength, could have significant benefits for overweight/obese children psychological health.

Ultesch et al. (2018) examined children's accuracy of physical self-concept as predictive factor for their future physical activity. Analyses revealed that children who perceive their motor competence more accurately show more future physical activity, and the effect is stronger for underweight and overweight/obese children, related to normal weight children (Utesch et al., 2018). Fu et al. (2019) investigated the relation between physical activity, sedentary behavior and motivation during a 12 weeks classroom-based Active Video Game program. Results evidenced a significant negative trend for sedentary behavior, an important increase in light and vigorous physical activity, step counts and enjoyment. Recent studies demonstrated the potential and additional benefits of regular and structured for children's and adolescents' self-concept and enjoyment, in a way that is favorable and encouraging for promoting their academic achievement (van de Berg et al., 2019; Dapp & Roebers, 2019). Physical activity intervention is associated with increased self-concept and self-worth in children and adolescents. Compared with other setting and environment, school-based and gymnasium-based intervention are strongly associated with increased self-concept (Liu, Wu & Ming, 2015).

Flynn et al. (2018) examined active video games (AVGs) as a tool to improve fitness and attitudes toward physical activity during early adolescence (50% overweight or obese). Participants improved the number of sit-ups and step-ups they completed from pre- to postintervention ($p < .05$). Participants also increased their self-efficacy, attitude to exercise and perceived social support to physical activity ($p < .05$).

Enjoyment reduction during PA and lower psychosocial profile of children may underline the decreasing rate of PA participation and the related decline of motor performances. Bai e al. (2017) evidenced that lower levels of enjoyment corresponded to lower levels of PA, while students with high enjoyment during PA reported high levels of PA. Moghaddaszadeh, Ahmadi & Belcastro (2017) assessed psychosocial functioning and enjoyment in a sample of thirty-three children. Results showed that active play program could enhance PA enjoyment, promoting PA participation, especially in girls.

7. Conclusions

Physical education at school offers all children and young people numerous and fun opportunities to increase their daily and weekly physical activity levels during the school day. In fact, curricular motor activities and periods of recreation offer children regular opportunities for learning and motor development (interdependent relationship) and rich social interactions (Meyer et al., 2013). The quantity and quality of studies on physical activity in developmental age and sedentary behaviors have rapidly increased in recent years but research directions are often followed in an uncoordinated way among scholars.

Grasten & Yli-Piipari (2019) suggests that school-based physical activity programs have to provide all children positive experiences, improving their motivation, and MVPA participation during school days and leisure time.

To reach an international consensus on the priorities of research in the field of physical activity and motor development for the health of children and adolescents, two independent groups of scholars (Delphi procedure) were compared, in order to define a list of research priorities for the next ten years (Gillis et al., 2013).

Among the top three research priorities (out of 29) for the next 10 years, the following were identified:

a) develop effective and sustainable interventions to increase long-term children's physical activity;
b) implement policies to promote environmental change and their influence on the levels of physical activity and the reduction of sedentary behavior in children;
c) longitudinal studies on the effects of physical activity on sedentary habits and health promotion.

The motor evaluation in secondary school allows to acquire data on the quality of teaching, on motor development, indicators of the health conditions of young people and to reconstruct the habits of motor activities carried out during the day or in a week.

8. Recommendations and Methodological Implications

Sedentary habits, characteristics of street furniture (lack of parks, cycle paths, equipped spaces), family organization and socio-economic status are among the fundamental determinants of deconstructed motor practice. Unfortunately, overweight and obesity (frequently deriving from poor dietary habits) negatively affect the learning process of motor skills, the execution of executive variants of motor tasks, motor coordination. Furthermore, they are limiting factors for the success of motor tasks that require the horizontal and vertical movement of the body (expressions of force and speed); these tasks are often associated with the perception of fatigue that leads to giving up or avoiding any motor activity. It is therefore necessary to propose activities adapted to the motor skills of children with a higher body mass index, in the parameters of executive

difficulty, duration and intensity, to help increase the quantitative and qualitative levels of physical activity, promoting success and motivation to continue.

The aim is to propose motor tasks through production styles (Mosston & Ashworth, 2008), in particular guided discovery and problem solving and through reproduction, practice and self-verification styles, in order to adapt the executive variants to promote the perception of competence (task successfully performed) and fun. The variation of teaching styles is essential to encourage the personalization of the motor task. Among the essential and indispensable skills of the Physical Education Teacher is the quality of the didactic action through the personalization of the motor task and the educational intervention in the motor and youth sports field.

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