Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva / Italian Journal of Health Education, Sports and Inclusive Didactics - Anno 6 n. 2 - ISSN 2532-3296 ISBN 978-88-6022-450-7 - aprile - giugno 2022 - CC BY-NC-ND 3.0 IT- https://doi.org/10.32043/gsd.v6i2.644

ACTIVE BREAKS IN KINDERGARTEN

LE PAUSE ATTIVE NELLA SCUOLA DELL'INFANZIA

Antonio Ascione[1]
Università degli Studi di Bari "Aldo Moro"
antonio.ascione@uniba.it

Abstract
The World Health Organization (WHO, 2020) considers physical inactivity and its increasing sedentary behavior in many countries. In fact, sedentariness is rated as one of the biggest public health problems of the 21st century, especially for the health risks arising from overweight and obesity. To prevent the occurrence of such risks to the health of young people aged 5 to 17, the minimum amount of movement required recommended by the WHO is 60 minutes of physical activity, mainly aerobic, moderate to intense every day at least three days a week. Despite this, many young people do not respect these indications and the percentages of overweight children and adolescents have more than tripled in the last twenty years. We therefore need programmes and initiatives to promote health, and for that reason, schools play a decisive role. Active breaks, that is to say short periods of physical activity during breaks from school education, can be a useful tool to be integrated into the school curriculum. This work has demonstrated the effects of a program of active breaks on the perception of their motor skills and on the levels of enthusiasm and pleasure perceived by the pupils of the final year of kindergarten, whereas the enjoyment and self-efficacy measured during the experience of movement condition the motivation of children to develop physical and motor activity over the years.

L'Organizzazione Mondiale della Sanità (OMS, 2020) considera l'inattività fisica e i relativi comportamenti sedentari in aumento in molti paesi. Infatti, la sedentarietà è valutata come uno dei maggiori problemi di salute pubblica del XXI secolo, soprattutto per i rischi per la salute derivanti dal sovrappeso e dall'obesità. Per prevenire l'insorgenza di tali rischi per la salute dei giovani dai 5 ai 17 anni, la quantità minima di movimento necessaria raccomandata dall'OMS è di 60 minuti di attività fisica, principalmente aerobica, da moderata a intensa ogni giorno almeno tre giorni alla settimana. Nonostante ciò, molti giovani non rispettano queste indicazioni e le percentuali di bambini e adolescenti in sovrappeso sono più che triplicate nell'ultimo ventennio. Per cui, urgono programmi e iniziative di promozione alla salute e per questo, la scuola riveste un ruolo determinante. Le pause attive, vale a dire brevi periodi di attività fisica praticati nelle pause dall'istruzione scolastica, possono rappresentare uno strumento utile da integrare al curricolo scolastico. Questo lavoro ha comprovato gli effetti di un programma di pause attive sulla percezione delle proprie abilità motorie e sui livelli di entusiasmo e piacere percepiti dagli alunni dell'ultimo anno della scuola dell'infanzia, considerando che il divertimento e l'autoefficacia misurate durante l'esperienza del movimento condizionano la motivazione dei bambini a sviluppare, negli anni, attività fisica e motoria.

Keywords

Motor Education, Active Breaks, School, Educational Alliance, Motor Learning.

Educazione Motoria, Pause Attive, Scuola, Alleanza Educativa, Apprendimento Motorio.

1. Introduction

Physical activity is defined by the World Health Organization (2010) as any bodily movement produced by skeletal muscles that requires, in the individual, a greater expenditure of energy than rest (WHO, 2020).

Physical activity includes sports, activities carried out in a regulated and competitive context, or are intended movements included in spontaneous motor activity (walking, climbing stairs, playing, etc.). However, physical exercise is a properly planned, structured, time-repeated and intentional form of physical action that aims to improve or maintain a certain level of fitness, performance and health (WHO, 2010). The benefits that physical activity has in children and adolescents are associated with a more favorable state of psychophysical well-being attested by multiple health indicators (King et al, 2019). Modern technological developments and digital communications have affected the way children study and spend their free time by becoming less active. In addition, sedentary behaviors are associated with different poor health responses (WHO, 2020). In fact, in children, as well as in adolescents, a significant relationship has been found between the time spent in front of television or other electronic devices and obesity, Dietz & Gortmaker (1985). In fact, these authors have conducted a study on the function of television in childhood obesity, and have indicated that every additional hour of television per day increases the prevalence of obesity by 2%, while other researchers found that reducing television viewing by children lowers their body mass index (Epstein et al., 2002). The increase of overweight and obesity in childhood is currently a major problem, in fact, cases of obesity and overweight in children have increased due to several social changes in the last thirty years (Ministry of Health, 2019). Many of the transversal changes that have led to the spread of this phenomenon, such as: high-calorie food (fast food) and carbonated drinks, environmental changes (expansion of the city and the increase in pollution) and finally the increase of the time spent in sedentary activities such as watching television, (Anderson & Butcher, 2006). Current social issues have focused research on increasing sedentary behaviours and the resulting increase in obesity rates and associated metabolic diseases, determined thus, the importance of the benefits of exercise on the physical health of children who are in favor of promoting the overall development of the person (Stoddenet al., 2021). Indeed, Stodden et al., emphasize the role of the movement as a promoter of the health and holistic development of the child, considering the environment predisposed to physical activity (Stodden, et al. 2021). Also Pesce, et al. 2021, hypothesize that the characteristics of the environments in which children practice physical activity, both spontaneous and structured, can activate or deactivate conditioning with physical, cognitive, social and emotional responses.

2. The Movement for the Global Development of the Child

The relationship between the environmental context and the development of the child is amply demonstrated in the literature, as well as the movement, which plays a fundamental role in the global development of the person (Stodden, et al. 2021). This may explain the importance of the development of secondary intersubjectivity, which occurs between 9 and 12 months of life. In this precise period of development, the child acquires the ability to coordinate and share attention on objects or events with an interlocutor. The pointing, that is the action of indicating an object with the finger, sharing in this way the objective of its attention. This behavior is a predictor of an improvement in the degree of progressive language development in the child (Rochat & Striano, 1999). In this action, the acquisition of a motor ability, such as pointing and grasping an object, combined with the cognitive ability of the intentionality of directing another person's attention to the same object, stimulate the child to social activities, (Stodden, et al. 2021). During early childhood the child learns a series of motor skills called fundamental motor skills (Fundamental Motor Skills). These skills represent the basis for the development of future movement skills, useful for the construction of "a sufficiently diversified motor repertoire that will allow the subsequent learning of adaptive and qualified actions that can be flexibly adapted to different and specific contexts of movement", Clark & Metcalfe, 2002. These locomotor abilities, also referred to as FMS, are the control abilities of objects and involve moving the body into space such as: running, jumping, sliding (Haywood & Getchell, 2021). While, object control skills consist of: manipulation,

intercepting projection of objects and include throwing, grabbing, kicking, and rolling. Stodden et al. (2008) hypothesized a conceptual model based on the dynamic relationship between motor competence and physical activity, according to which increasing the competence of fundamental motor skills also increases participation in physical activity; This increased participation therefore contributes to a further improvement in motor competence. However, Stodden argues that the real motor competence acquired by the child is not enough to predict whether he will engage with more or less motivation in the next physical activity. In reality another variable is inserted as mediator between competence in FMS and physical activity: perceived competence. Our performance, effort and persistence on a task are influenced by the personal perceptions and beliefs of each person regarding their own success (Eccles & Wigfield, 2002). In fact, a child perceives a task as difficult when he feels he does not possess the proper skills and abilities to perform it successfully (Stodden, et al. 2021). Thus, these studies reinforce the scientific evidence that perceived competence is a solid mechanism of motivation, to the point of influencing commitment and persistence in physical activity (Stodden, et al. 2008). There is however to emphasize, that the relations between the variable ones of this model change since they are in relation to the moment of the development of the sample. Indeed, Stodden points out that in early childhood, there is a low relationship between competence in fundamental motor skills and physical activity due to a variety of factors, including environmental conditions, the conditioning of parents and the inability of children to accurately assess their level of competence. Later, however, with the beginning of the second childhood, the relationship is strengthened because children have become more attentive and aware in judging their competence. In anticipation, children who have had high perceived skills in fundamental motor skills will continue to devote themselves to physical activity, triggering a positive spiral of: self-perception of their competence, of high levels of performance, of health benefits and reduced risks of overweight and obesity, McKenzie et al., 2002. In summary, the child who does not feel competent risks triggering a negative spiral while continuing to strengthen, throughout adolescence; the negative spiral of disengagement that will feed in turn the poor motor skills.

3. The Importance of Physical Activity and Active Breaks in School

The Ministry of Education, University and Research, among the purposes of the national indications of primary school, indicates the integral and harmonious development of the person (MIUR, 2012). In practice, the child must be placed at the center of the formative process and of its learning development, as an active subject, the only protagonist of its training, starting from the involvement of its corporeality. The correct amount of movement is recommended, not only for the physical well-being of the person but also to promote the development of relational and cognitive skills. Educational interventions useful to promote physical activity at school, such as active breaks or integrated physical activity, achieve different educational objectives:

• Fostering an active lifestyle by increasing physical activity levels (Drummy et al., 2016);
• Stimulating, through movement, positive effects on school performance and cognitive functions (Mazzoli, et al. 2019)
• Promoting the psychological and social well-being of pupils (Colella et al., 2020).

Thus, the Ministry of Health (MIUR, 2019) stressed the need for the implementation of concrete initiatives in the world of school, such as the implementation of reforms in school curricula that require more space for physical activity to reach the levels of optimal motor activity recommended by the WHO. In fact, primary school, in synergy with other institutions, primarily the family, must successfully promote the concept of active health, that is to educate children and families to choose healthier and more active lifestyles (Casolo, 2019). It is therefore necessary to redefine the spaces and times of teaching activities, in order to encourage the hours of movement at school, not limiting them only to the curricular hours of Physical Education. Casolo himself recommends, through appropriate programming, the adaptation of physical environments (classrooms, gyms, courtyard, garden) and the predisposition of school times in

which motor activity can be increased in addition to two hours per week and for a period of at least 20 weeks, which are already guarantees of an average increase per year of about 6% in motor skills, strength and endurance. Motor activities can, therefore, also take place during different times of the school day, outside of the traditional Physical Education. Such moments can be, the interval, the breaks between a lesson and the next, or during other hours of curricular lesson. In addition to gyms, some schools are more virtuous, having the advantage of having common spaces that can be used for movement (atria, corridors, courtyards, stairs), or outdoor spaces such as gardens. Each school could use its external environments to respond to the physical and emotional needs of the students to live in contact with nature and feel inserted in an environment that, normally, is, instead, alien to their ordinary daily life (Monti, et al. 2017). In fact, many outdoor movement games can be proposed easily and their implementation over time, produces positive effects on the psychophysical balance and health of pupils, improving cardio-circulatory and respiratory function, the harmonious development of the body through the improvement of conditional (strength, endurance, speed and mobility articulation) and coordination (balance, rhythm, orientation space-time, motor combination, anticipation, differencing and imagination) and the emotional, character and relational sphere (capacity for adaptation, sacrifice, active participation, empathy, discipline and culture of single and group work), Portera (2020). Thus, physical activity in the classroom can differ in:

• Active breaks: short periods of physical activity during the breaks of the curricular activity;

• Integrated motor activity: moments of physical activity that include the school contents of the disciplines.

Physical activity interventions at school can improve children's commitment to the effective solution of the task assigned to them and their behavior in the classroom (Rasberry, et al., 2011). Long periods of teaching time without any breaks can adversely affect the behavior of students as well as the tasks assigned to them and can become counterproductive for academic performance (Mahar et al., 2006). Conversely, it has been shown that short ten-minute breaks of physical activity positively support behavior while performing a task and help students focus better (Grieco et al., 2016). Therefore, such studies confirm that the behavior of children during the curricular lessons can affect the learning of the same disciplines, therefore, performing activities in the classroom can be a valid strategy, as well as low cost, to improve student engagement and learning outcomes (Watson et al.,2017). Physical Education should be compulsory in every school starting from kindergartens, but we should not force learners to do it, the goal should be to make them aware of its benefits. This reinforces the need for physical activity in the school context. In fact, the enactment of the new 2022 bill, art. 103 provides for the introduction of teachers with training suitable for the teaching of motor and sports sciences in primary school. So, with the new ministerial measure, starting from the school year 2022/23, provides for the presence of a specific teacher, trained specifically for the hours of Physical Education. The introduction of the Physical Education teacher is foreseen, for now, only for the fifth class starting from the 2022/2023 school year and for the fourth class starting from the 2023/2024 school year. In summary, despite the scientific evidence, which confirm the effectiveness of active breaks, as a useful means to increase physical activity levels, improve classroom behavior, stimulate the development and performance of executive functions, their effect depends on the degree of active involvement of teachers (Erwin, et al. 2011). An effort is needed to stimulate teachers to the need for movement in the school context, taking into account the non-physical advantages, but above all to reduce risks and improve health. Living well at school, living the daily lessons in an engaging and concentrated classroom atmosphere, benefits everyone and predisposes to long-lasting learning (Masini et al., 2020).

4. Experimental Educational Protocol: Active Breaks

The purpose of this study was to assess whether the active interruptions actually induce the expected improvements and also, what are the personal perceptions of the children involved. The research was proposed and carried out in the children of the last year of a kindergarten in Campania. The survey took place from 4 April to 11 June of the 2021-22 school year. 30 students between the ages of 5 and 6, 16 girls

and 14 boys, were involved in the study. All were informed in advance (school staff and parents) about the objectives of the study. In particular, parents were asked to authorise the participation of their children in the intervention by informed consent. The focus of the research activity is on motor coordination, executive functioning, enthusiasm and perceived pleasure. The aim was also to investigate the effects of active breaks on the usefulness and effectiveness as a teaching and educational tool for the teacher. To this end, two motor tests have been planned to evaluate the aerobic endurance capacity and the coordination of children: the yo-yo endurance test (modified in length from 20 to 8 meters), to establish the levels of aerobic endurance capacity, while to evaluate motor coordination, the Körperkoordinationstest für Kinder (KTK), Vandorpe et al., (2011) was used. The Ktk test, useful in children aged 5 to 14 years, evaluates both coordination and conditional skills. In fact, through the administration of four tests it is possible to verify the balance, laterality, strength, resistance and speed. The executive functioning of the students was verified through the MF20 test (Marzocchi, et al. 2010), useful to evaluate the focus of children on a specific stimulus for a long period of time. The test, suitable for children from 5 to 13 years, is suitable for evaluating the control of the impulsive response. It consists in searching for an objective image present within 5 distractions. Finally, the children found enthusiasm through the use of a self-assessment scale, the Perceived Physical Ability Scale for Children (Colella et al., 2008), while and pleasure was accurate through the Quest Enjoyment test (Di Cagno, et al. 2006).

Perceived Physical Ability Scale for Children

The group of children who participated in the experimental protocol performed the exercise of 1 active break per day, twice a week, for a total period of ten weeks of testing. After each active break, the children were asked to complete, two questionnaires on which the scales of evaluation were reported, referring to the feelings-perceptions of self-efficacy and satisfaction of the activity carried out. Everything was agreed with the teachers, including the scale used and proposed to the children, at the end of the active break. This scale, the Perceived Physical Ability Scale for Children, developed by Colella et al., (2008), was necessary to assess the self-perception of one's motor skills, identifying six elements representing strength, speed and coordinating abilities. The children were asked to think about themselves while they were taking the test and to choose answers whose score to be attributed by the teacher, ranged from 1 (I run slowly) to 4 (I feel very fast when I run). The total test score could vary from 6 to 24. If a child had obtained a high score, it meant that they had a significant perception of their physical abilities, while lower scores reflect a low perception of themselves.

Quest Enjoyment Test

The Quest Enjoyment Test (Di Cagno, et al. 2006), proposed to students after each active break, to evaluate the perceived pleasure, allowed each child to evaluate their appreciation for the activity of active break just carried out. The evaluation scale including six pairs of elements, organized in a scale whose pair was inclusive of two elements extreme to each other (Contented to - Discontented to, Amused to - Bored to). At the maximum score of 5 were attributed the most positive moods perceptions, on the contrary, approaching 1 or 2 scores related to negative moods.

Educational Intervention of Active Breaks

The active break interventions took place over a period of 10 weeks twice a week, for a total of 20 active breaks carried out. In each active break a game or physical exercise of the teacher's own choice has been

https://doi.org/10.32043/gsd.v6i2.644

proposed. An active break widely used by the two classes was through mirror play. The spaces used were the classrooms, because they were large enough to allow all the students to do the exercises without hindrance. The windows were also opened for the duration of the activity so as to allow air circulation and make the room well ventilated. After a first phase of training and explanation of the rules, which lasted three days, we entered the stable action of the active break whose purpose was to prioritize the attention of children on the correct execution of the exercise within the available spaces, rather than on the rules of the game itself. This phase lasted from 3 to 4 minutes and was usually followed by a moment of recovery. In the game of the mirror, name chosen by the children themselves, the children imitated the indications of an Avatar placed in the LIM, repeating movements on the spot such as: the march, the monopodalic steps in all directions, rotations, jumps and the combination of the same movements with the movement of the upper limbs. The physical effort has also been progressively increased, in order to reach a higher level of intensity. In fact, the teacher increased the rhythm of the actions indicating through the Avatar movements faster enough to increase the motor effort required to the pupils. The active break ended after 10 minutes of motor action and immediately the self-assessment scales of enthusiasm and perceived pleasure were delivered to the children. The children indicated on the card their name and the date of the day on which the active break had taken place, and, after completing it, the card was immediately given to the teacher. No time limit has been imposed on the compilation of self-assessments to allow children to respond calmly.

Results

In addition to the descriptive statistical analysis of the sample of participants (average BMI ± SD), the analysis of enthusiasm and perceived pleasure data, collected through the use of self-assessment scales of pupils, was performed. For each active pause intervention, the average of the scores obtained by the children was determined and the same were then inserted in a Cartesian diagram showing the trends of the two variables examined during the course of the intervention program. The scores were calculated and analyzed using the Microsoft Excel program. Over time, there has been a progressive, albeit irregular, improvement in the levels of self-effectiveness of one's motor skills, as pointed out by the students. The data have shown that, as the programme progresses, there can be a slight improvement, both of perception that children have with respect to their motor skills and both with respect to the positive emotional states associated with fun and involvement in the practice of physical activity proposed. Table 1 shows the recorded data on the average self efficacy of pupils and pupils. It can be noted that the girls have expressed increasingly higher ratings than the male companions.

Giornale Italiano di Educazione alla Salute, Sport e Didattica Inclusiva / Italian Journal of Health Education, Sports and Inclusive Didactics - Anno 6 n. 2 - ISSN 2532-3296 ISBN 978-88-6022-450-7 - aprile - giugno 2022 - CC BY-NC-ND 3.0 IT- https://doi.org/10.32043/gsd.v6i2.644

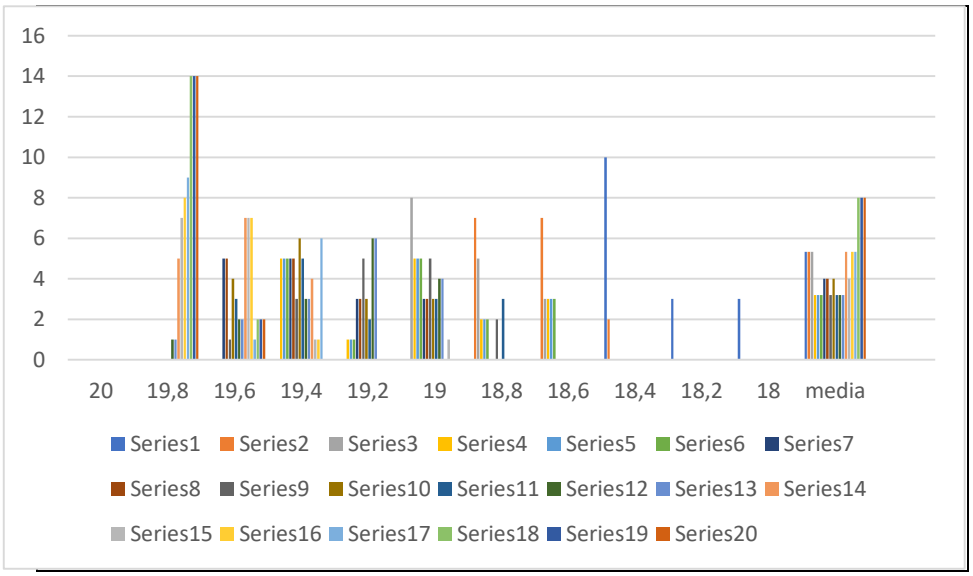

Table 1 - Effects of Active Pauses on Usefulness and Effectiveness as a Teaching Tool

In Table 2, on the other hand, we can observe the trend and the changes in the average of all children in the 10 weeks of application of the active breaks of intervention.

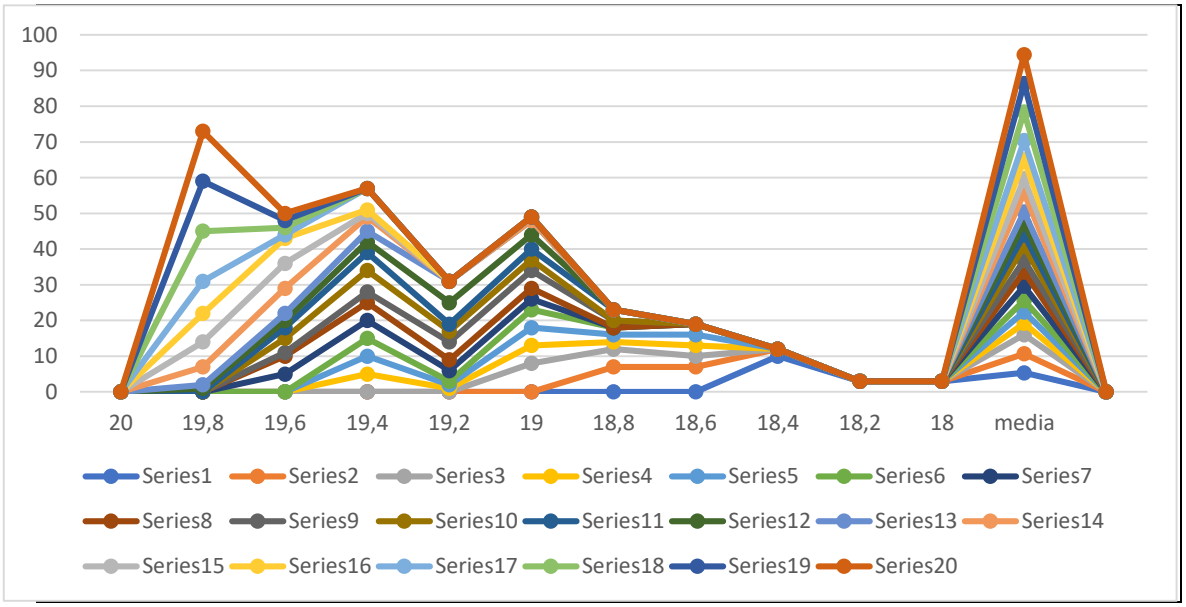

Table 2 - Trends and changes in the averages of all children

The average value (Table 3) was 15,8 ±1,16 points, recorded in the first active pause, is observed from the graph a gradual, albeit irregular, increase in the level of perceived self-awareness, up, in fact, to a maximum of 19,8 ±1,69 obtained in the fifteenth and sixteenth intervention.

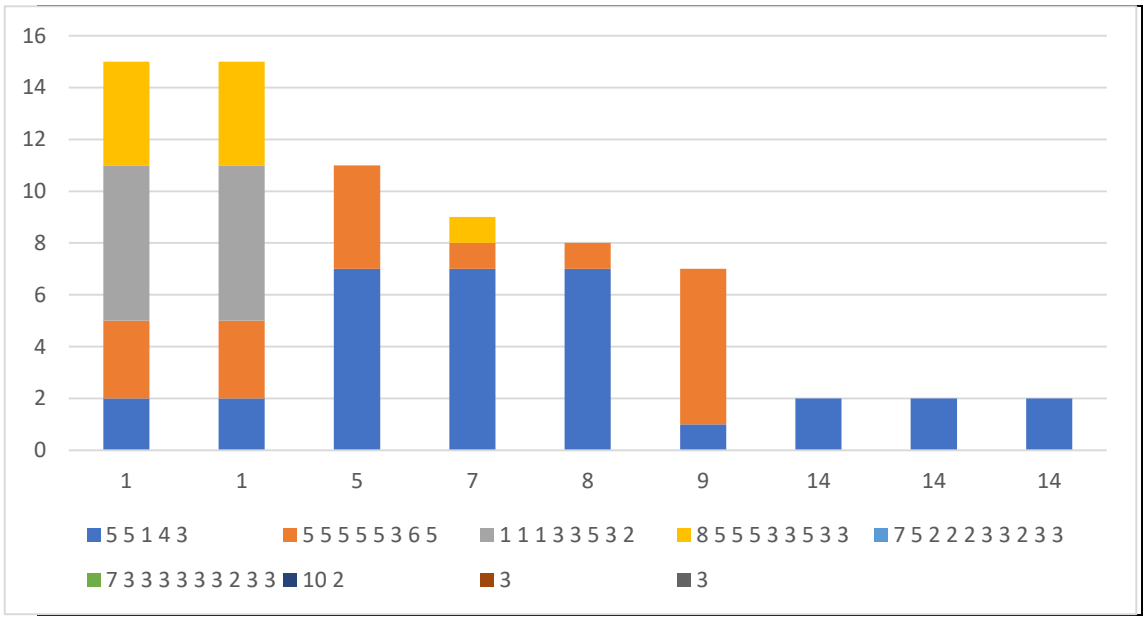

Table 3 - Average Value of Self-awareness

5. Impact of Research on Motor Education

This study evaluated the effectiveness of physically and cognitively engaging active breaks on the enthusiasm and perceived pleasure of children aged 5-6, attending the final year of kindergarten. In 10 weeks, active breaks of increasing intensity, lasting 10 minutes, have slightly improved the pupils' perception of their motor skills with regard to personal strength, speed and perceived coordinating abilities. The proposed results, on pleasure and self-efficacy, do not differ much from other studies, confirming that the pleasure of a motor experience affects the sense of perceived self-efficacy, thus confirming the difficulty of perceived experience. Therefore, the pleasure in performing the motor activity is as important as the perception of the satisfaction index. It is therefore essential to consider the quality of the educational proposals to encourage children to participate in physical activity (Fish & Ben-Soussan, 2016) because the increase in positive experiences achieved by pupils determines, in them, also a greater intrinsic motivation to engage in active behaviors protracted over time. In addition, it should be considered that increasing levels of physical activity are a valuable tool for reducing the health risks related to children caused by excessive sedentary behaviour (Colella, et al. 2020). This study allows us to observe how important it is to satisfy the physical need for movement and to encourage the psychological well-being of children, an objective that must necessarily include all teachers and not only the teacher of Physical Education. Finally, we can confirm, that active breaks can be included in the school curriculum of kindergarten.

Bibliographical References

Anderson, P. M. & Butcher, K. F. (2006). Childhood obesity: trends and potential causes. The Future of children, 19-45..

Bangsbo, J., Iaia, F. M., & Krustrup, P. (2008). The Yo-Yo intermittent recovery test. Sports medicine, 38(1), 37-51.

Casolo, F. (2019). Scuola primaria: Spazi ambientali e temporali per l'educazione motoria. Pedagogia Oggi, 17(1), 493-508.

Clark, J. E., & Metcalfe, J. S. (2002). The mountain of motor development: A metaphor. Motor development: Research and reviews, 2(163-190), 183-202.

Colella, D., Morano, M., Bortoli, L., Robazza, C. (2008). A physical self-efficacy scale for children. Social Behavior and Personality: an international journal, 36(6), 841-848.

Di Cagno, A., Crova, C., Pesce, C. (2006). Effects of educational rhythm-based learning on coordinative motor performance and sports enjoyment of male and female pupils. Journal of Human Movement Studies, 51(3), 143-165.

Dietz Jr, W. H., & Gortmaker, S. L. (1985). Do we fatten our children at the television set? Obesity and television viewing in children and adolescents. Pediatrics, 75(5), 807-812.

Drummy, C., Murtagh, E. M., McKee, D. P., Breslin, G., Davison, G. W., Murphy, M. H. (2016). The effect of a classroom activity break on physical activity levels and adiposity in primary school children. Journal of paediatrics and child health, 52(7), 745-749.

Eccles, J. S.& Wigfield, A. (2002). Motivational beliefs, values, and goals. Annual review of psychology, 53(1), 109-132.

Epstein, L. H., Paluch, R. A., Consalvi, A., Riordan, K., Scholl, T. (2002). Effects of manipulating sedentary behavior on physical activity and food intake. The Journal of pediatrics, 140(3), 334-339.

Erwin, H. E., Beighle, A., Morgan, C. F., Noland, M. (2011). Effect of a low-cost, teacher-directed classroom intervention on elementary students' physical activity. Journal of School Health, 81(8), 455-461.

Grieco, L. A., Jowers, E. M., Errisuriz, V. L., Bartholomew, J. B. (2016). Physically active vs. sedentary academic lessons: a dose response study for elementary student time on task. Preventive medicine, 89, 98-103.

Haywood, K. M. & Getchell, N. (2021). Life span motor development. Human kinetics.

King, A. C., Whitt-Glover, M. C., Marquez, D. X., Buman, M. P., Napolitano, M. A., Jakicic, J., Tennant, B. L. (2019). Physical Activity Promotion: Highlights from the 2018 Physical Activity Guidelines Advisory Committee Systematic Review. Medicine and science in sports and exercise, 51(6), 1340-1353.

Mahar, M. T., Murphy, S. K., Rowe, D. A., Golden, J., Shields, A. T., Raedeke, T. D. (2006). Effects of a classroom-based program on physical activity and on-task behavior. Medicine and science in sports and exercise, 38(12), 2086.

Marzocchi, G. M., Re, A. M., Cornoldi, C. (2010). BIA. Batteria italiana per l'ADHID per la valutazione dei bambini con deficit di attenzione-iperattività. Con DVD e CD-ROM. Edizioni Erickson.

Masini, A., Marini, S., Leoni, E., Lorusso, G., Toselli, S., Tessari, A.,Dallolio, L. (2020). Active breaks: A pilot and feasibility study to evaluate the effectiveness of physical activity levels in a school based intervention in an Italian primary school. International journal of environmental research and public health, 17(12), 4351.

Mazzoli, E., Koorts, H., Salmon, J., Pesce, C., May, T., Teo, W. P., Barnett, L. M. (2019). Feasibility of breaking up sitting time in mainstream and special schools with a cognitively challenging motor task. Journal of sport and health science, 8(2), 137-148.

McKenzie, T. L., Sallis, J. F., Broyles, S. L., Zive, M. M., Nader, P. R., Berry, C. C., Brennan, J. J. (2002). Childhood movement skills: predictors of physical activity in Anglo American and Mexican American adolescents?. Research quarterly for exercise and sport, 73(3), 238-244.

MIUR, Ministero dell'Istruzione, (2012). Indicazioni nazionali per il curricolo della scuola dell'infanzia e del primo ciclo d'istruzione. Roma.

Ministero della Salute. (2019). Linee di indirizzo sull'attività fisica per le differenti fasce d'età e con riferimento a situazioni fisiologiche e fisiopatologiche e a sottogruppi specifici di popolazione.

Monacis, D., Colella, D., Scarinci, A. (2020). Health education intervention in primary school: active breaks for the promotion of motor activity. Form@ re-Open Journal per la formazione in rete, 20(1), 336-355.

Monti, F., Farné, R., Crudeli, F., Agostini, F., Minelli, M., Ceciliani, A. (2019). The role of Outdoor Education in child development in Italian nursery schools. Early Child Development and Care, 189(6), 867-882.

Pesce, C. & Ben-Soussan, T. D. (2016). "Cogito ergo sum" or "ambulo ergo sum"? New perspectives in developmental exercise and cognition research.

Pesce, C., Vazou, S., Benzing, V., Álvarez-Bueno, C., Anzeneder, S., Mavilidi, M. F., ... & Schmidt, M. (2021). Effects of chronic physical activity on cognition across the lifespan: a systematic meta-review of

randomized controlled trials and realist synthesis of contextualized mechanisms. International review of sport and exercise psychology, 1-39.

Portera, A. (2020). Manuale di pedagogia interculturale: risposte educative nella società globale. Gius. Laterza & Figli Spa.

Rasberry, C. N., Lee, S. M., Robin, L., Laris, B. A., Russell, L. A., Coyle, K. K., Nihiser, A. J. (2011). The association between school-based physical activity, including physical education, and academic performance: a systematic review of the literature. Preventive medicine, 52, S10-S20.

Rochat, P. & Striano, T. (1999). Social-cognitive development in the first year. Early social cognition: Understanding others in the first months of life, 3-34.

Stodden, D., Lakes, K. D., Côté, J., Aadland, E., Brian, A., Draper, C. E., Pesce, C. (2021).Exploration: an overarching focus for holistic development. Brazilian journal of motor behavior, 15(5).

Stodden, D. F., Goodway, J. D., Langendorfer, S. J., Roberton, M. A., Rudisill, M. E., Garcia, C.,Garcia, L. E. (2008). A developmental perspective on the role of motor skill competence in physical activity: An emergent relationship. Quest, 60(2), 290-306.

Stonerock, G. L. (2015). Exercise as Treatment for Anxiety: Systematic Review and Analysis. Annals of behavioral medicine: a publication of the Society of Behavioral Medicine, 49(4), 542–556.

Vandorpe, B., Vandendriessche, J., Lefèvre, J., Pion, J., Vaeyens, R., Matthys, S., Lenoir, M. (2011). The Körperkoordinationstest für kinder: Reference values and suitability for 6–12-year-old children in Flanders. Scandinavian journal of medicine & science in sports, 21(3), 378-388.

Watson, A., Timperio, A., Brown, H., Best, K.,Hesketh, K. D. (2017). Effect of classroom-based physical activity interventions on academic and physical activity outcomes: a systematic review and meta-analysis. International Journal of Behavioral Nutrition and Physical Activity, 14(1), 1-24.

WHO. (2010). Global recommendations on physical activity for health. World Health Organization.

WHO. (2020). WHO guidelines on physical activity and sedentary behaviour. Ginevra.