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Neonatal Water Movement (3 months - 3 years) and Physical Literacy

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Abstract

This paper proposes neonatal water movement (3 months - 3 years) as an inclusive teaching-learning strategy based on a recreational-educational motor education in a water environment, useful to contribute to the promotion of one's own well-being through the achievement of a Physical Literacy. An essential human capability that includes motor, emotional, relational and cognitive skills (life skills) useful to consolidate the awareness of the value and importance of a constant practice of motor activity throughout life. Particular attention has been paid to water as a unique resource capable of offering a multisensory, perceptual and dimensional stimulation accessible in the first years of life, even in conditions of diversability.

Keywords

Baby, Physical Literacy, water movement in the early years, Wellbeing, Life Skills, Inclusion

Introduction

The definition *physical literacy* indicates "the literacy of the body", which is articulated throughout life and affects the emotional, social, cognitive and motor areas. This is a key opportunity to acquire, from the birth and up until the old age, a series of good practices aimed at a healthy and active lifestyle (Whitehead, 2010,2013b); it also includes maintaining the ability to interact with different environments through the senses, to perceive and to better manage, with control and economy, one's own body in movement (Whitehead, 2001).

Motor education must be the starting point on which to base a didactics able to guarantee a harmonious development of the physical-motor, psychological, cognitive, and affective-relational functions in every child.

Immersion in water widens the field of human experiences, allowing making experiences at motor, sensory, emotional, affective and social level, in a different way from the life of terrestrial relationship, by significantly changing the physiological responses of the organism, both during resting and when exercising (Pendergast, Moon, Krasney, Held, & Zamparo, 2015). Carrying out the activity in an unusual environment such as water allows children experiencing peculiar spatial conditions and movements that, at that age, cannot be lived in the terrestrial environment.

The human body immersed in water, being it completely enveloped by that element, is constantly stimulated to multisensory and multidimensional experiences fundamental to enrich the corporeal Self (Whitehead, 2001), thus promoting, through the involvement of the *whole* person, the physical, psychosocial, (Benetton, 2014) and emotional-motivational well-being.

Water can be the tool for expanding the newborn's perceptions and cognitive component fields, through a better self-awareness and positive mental representations. By learning to act safely in the water, it is possible to develop self-esteem, mental health and the serenity necessary to carry on the activity with joy and satisfaction (Moody, Hale, & Waters, 2012).

The water environment generates an impressive mass of completely new sensations (of visual, tactile, kinesthetic and labyrinthine type) while, at the same time, the usual and reassuring signals of the ground are missing. The sensorimotor system (perceptual system + motor system, strongly connected with each other) is overwhelmed by a large amount of unknown information and goes "into crisis" (Di Palma, Ascione, Rosa, 2018).

The aim of this article is the valuable aspect of motor education proposed in the water environment, in the first years of life, and the way the concept of Physical Literacy represents the aims of an educational process aiming at the autonomy of the child, future adult and elderly man. The expression of Physical literacy occurs through choices, attitudes and behaviors, aiming at an active lifestyle corresponding to a set of skills and competences (life skills) that make it possible for the individual to realize positive life behaviors aimed at maintaining and improving the physical, psychological, cognitive, affective and social well-being (Whitehead, 2010)

1. Motor Education and Physical Literacy

The definition of Motor Education refers to a type of activity that is not only based on muscular-skeletal development, but which aims at the child's holistic growth that guarantees the improvement of psycho-intellectual and social-relational abilities.

Motor activity and game are not moments of fun with an end to themselves, but they have repercussions on the child's emotional dimension and, by enhancing sensory-protective activities (Piaget, 2000, Gesell 1950), guarantee the learning and development of Multiple Intelligences (Gardner, 2013; Goleman, 1995) and promote the acquisition of important moral values such as respect, solidarity, mutual help, and inclusion.

Motor education can and must be considered as co-essential and co-disciplinary to the education of every human being, and must not be included in the practical-training activities.

It is essential that, in the teaching of motor and sports education, the innate potential that describes the *embodied dimension* of human nature (Whitehead, 2010) and the objectives of Physical Literacy are pursued.

Movement is the main way to express oneself, communicate and understand. All the experiences that involve the corporeity and the emotional sphere strongly influence the identity of every human being.

The educational and social value of the movement is recognized and promoted internationally, and is combined with a reconsideration of the concepts of health and well-being, taking on increasing importance in the lives of all human beings with or without disabilities (De Vita e Rosa, 2018).

The paradigm *of the Embodied Cognitive Science*, starting from the assumption of the centrality of the emotional-bodily dimension as the foundation of the cognitive processes involved in the development, and from Neuroscientific studies concerning the valorization of the *extended corporeality* (mind-body-emotions), recognizes in the corporeality the primary dimension for the success of the processes that influence and lead the changes in human behavior, through which related actions and relationships are developed.

According to the theory of the *embodied cognition,* every form of human cognition is *embodied*, i.e. it is rooted in the corporeal experience. The apparently more "abstract" cognitive activities are, in fact, transformations of more basic corporeal experiences too.

Body and movement are the first tools we use to experience and through which we perceive, seek and learn.

Making the experience of corporeality and movement significant is related to the teacher's ability to stimulate reflection and creativity in learners, and to create contexts and learning environments that guide or facilitate the discovery of new knowledge in the techniques of inductive didactics of motor activities, contributing to the achievement of a *Physical Literacy*

Physical Literacy can be described as motivation, trust, physical competence, knowledge and understanding to evaluate and take responsibility for the commitment to physical activities for life (IPLA - International Physical Literacy Association, 2017).

Its meaning is linked to that of *capability*, which is: a provision to capitalize on innate essential human capabilities useful to develop awareness of the value of physical activity throughout one's own lifetime.

Physical literacy is a fundamental and precious human capability to understand the importance of physical goals aimed at maintaining personal well-being as an integral part of lifestyle (Almond, Whitehead, 2012).

In order to develop physical literacy already in childhood, children and adolescents should learn basic movement skills and basic sports skills in each of the four basic environments:

1. On the ground: as a basis for most games, sports, dance and physical activities
2. Into the water: as a basis for all water activities
3. On snow and ice: as a basis for all winter sliding activities
4. In the air: as a basis for gym, diving and other aerial activities (Balyi, Via, Norris, Cardinal & Higgs, 2005; Higgs, Balyi, Way, 2008)

The fundamental and significant aspects of physical literacy (*Whitehead, 2010)* are:

- everyone can be physically literate, being appropriate to what he is endowed with
- everyone's physical literacy journey is unique
- physical literacy is relevant and valuable in all life phases and ages
- the concept involves much more than physical competence
- the heart of the concept is motivation and commitment to be active
- the disposition is highlighted by the love to be active, born from the pleasure and satisfaction of people participating in the action
- a physically literate individual assesses and takes responsibility for carrying out targeted physical activities throughout his life

- Tracing the progress of a subject's personal journey must be assessed by making comparisons with previous outcomes, and not with any form of national benchmark.

A positive assessment criterion for the teaching of motor education can be considered as an element favoring *life skills*, which are included in the concept of *physical literacy* (Evans & Sleap, 2012; Taplin, 2011).

In 1986, in the Ottawa Charter for Health Promotion, the World Health Organization (WHO, 1986) recognized *Life Skills* as the skills necessary for people to make health-oriented choices and to develop and learn throughout life, and defines "Health promotion" as the process that enables people to increase control over their health and to improve it.

The ten *Life Skills,* identified by the World Health Organization (1993, 2003) following the elaboration from the "*Pan American Health Organization"* (PAHO, 2001), have been grouped together in three areas: that Emotional, Relational (social and interpersonal), and Cognitive.

- Emotional area:

1. Self-knowledge (Self-awareness): competence related to the knowledge of oneself, recognizing one's own resources and the limits of one's own behavior.
2. Emotion management: competence related to the ability to recognize and regulate one's own emotions and those of others.
3. Stress management: competence related to the ability to recognize and manage stressful events, and to implement strategies aimed at reducing their impact.

- Relational Area:

1. Effective communication: competence related to the ability to know how to express verbally and non-verbally, in an effective way, depending on the situation and the interlocutor. It means being able to actively listen to the other and expressing one's own needs and feelings.
2. Interpersonal relationships ability: understood as the ability to enter into relationships with others by managing to create and maintain meaningful interpersonal relationships.
3. Empathy: ability to feel and understand the emotional world of the other, to "put oneself in his shoes", even in unfamiliar situations, to facilitate the understanding and acceptance of different people too.

- Cognitive area

1. Decision-making as the ability to implement decision-making processes to face and solve different situations, through an assessment of possible alternatives and the consequences that each of them implies.
2. Problem-solving as a competence that allows solving problems in a positive and constructive way; problems that, if not resolved, can generate mental stress and physical tensions.
3. Creative Thinking (Creativity): competence that allows finding original solutions to deal with the situations of everyday life in an adaptive and flexible way, by analyzing the different solution possibilities.
4. Critical thinking: the ability to analyze experiences and situations in an objective way, by evaluating the influencing factors, i.e. the advantages and disadvantages. This allows assessing the different elements that condition the behavior.

2. The Game: recreational-educational strategy to promote learning

The game is a behavior common to all the most advanced animal species, and it is the main commitment of childhood. As an improvisation and combination vehicle, it is the primary inductor of regulatory systems by which the world of impulsive incentives replaces the cultural limitations (Bruner, Jolly, Sylva, 1995). For children, "game is life". In the game there is a great emotional participation that keeps the child gripped by engaging him in all his personality, guaranteeing the internalization of the effects much more than the outcomes of a "job".

Every human activity can be learned under the form of a game, based on a strong cognitive motivation understood as a desire to get to know and dominate the environment, to experiment one's own competence by pushing to learn and master new techniques, (problem solving) explore new possibilities, and challenge one's own limits.

Through the game, the need for self-realization is satisfied, since through trials, challenges, confrontation, affirmation and self-confirmation, it is possible to respond to that powerful inner incentive that leads to measure up with new skills.

The surprising aspect of the positive features of the game is that they are developed independently of the child's awareness that plays for mere pleasure, free from concrete purposes (Hahn, 1985)

It is the teacher's competence to suggest proposals that are educational in their content, but that do not distort the structure of the game by guaranteeing the child a high motivational state, which facilitates learning by making the efforts easily bearable.

The pedagogical and recreational-educational capacity of the game is therefore to use this innate behavior to predispose effective learning situations for personal growth.

From this analysis, it emerges that a greater quantity and quality of movement, carried out in a playful form and integrated into various activities, allows both for a better learning and for a better child's overall development.

The role of the structured game as an efficient strategy for increasing levels of motor skills has been highlighted by recent studies (Cardonm Van Cauwenberghe, Labarque, Haerens & De Bourdeaudhuij, 2008; Parish, Rudisill, & St. Onge, 2007).

The game in movement is the very first activity that the child naturally carries out by meeting every need he has, gratifies him by making him feel good, and the others feel good with him.

To favor a *healthy movement while playing*, in the evolutionary age, will lead to develop and strengthen not only the motor area, but it will inevitably effectively influence all the others: that social, emotional, relational and cognitive, allowing for complex learning with more motivation, interest, by consolidating, at the same time, positive learning and personality styles. (Valentini, Morbidelli, 2017).

The child has an innate instinct in learning, determined by the great metabolic activity and receptiveness of the Central Nervous System, resulting very sensitive to stimuli and naturally led to certain behaviors: tendency to play, need of competence, pleasure of discovery, and tendency to repetition.

Innate attitudes can be strengthened or dampened by experiences. Therefore, affectionately supported successful experiences favor an attitude of willingness to commit oneself by offering his best (self-esteem), respecting one's own potential and capabilities (self-efficacy, self-regulation, and self-perception).

Neurophysiological studies (Berthoz, 2003 - Damasio, 1994 - Edelman, 1993, Le Doux 1996, Goleman, 1995) underline how emotions can both influence and modify learning processes, and change a neural map becoming a fundamental element to facilitate or not its memory, whether it has a positive or negative value.

Emotions leave a mark and lead the thought negatively (determining inadequacy) or positively (acting as facilitators and catalyzing learning).

Research has highlighted how important the emotional dimension in the learning process is in the brain.

The pleasant effects on cognition would favor a creative and flexible way of thinking, helping create essential resources to cope with the most difficult life situations too.

Circularity is established between emotions and the learning context. Daniela Lucangeli (2011), with her theory of *Warm Cognition,* showed that, in learning, the child places in his memory the information and the emotion with which it was acquired; the information is placed in the semantic memory or in the procedural memory, while the emotion connected to it is placed in the autobiographical memory.

Water is a powerful "emotional activator". Depending on the way in which we learn within

that situation, the intensity, the emphasis on one aspect or another, the way of seeing the world after that experience, the reconfiguration of previous experiences, and system of synaptic intertwining established, will be different.

3. Water Environment, Neonatal Water Movement (3 months - 3 years), Benefits

Water is the first cradle of life and, for the newborn, to go back into it after his birth is an experience that can revive emotions, helps find ancient origins, encourages new opportunities for growth, stimulates psycho-physical and affective-relational attitudes. Thanks to the presence and constant contact with his mum and dad, as points of reference mediated by the attentive presence of the teacher, the exploration of the outside world is facilitated in a favorable climate aimed at a serene learning.

Into the water, children feel free thanks to the almost total absence of gravity. They can perform more complex movements, develop faster the awareness of their limbs in space, and increase the perception of their own body thanks to the stimulation of the vestibular analyzer with passages through the various positions (erect, in lateral decubitus, prone, supine).

Neonatal water movement is based on the knowledge of the effects directly deriving from the physical characteristics of the water (specific density, buoyancy, hydrostatic pressure, viscosity), using water and its physical properties as an unconventional learning environment useful to favor:

- an *education through water,* aimed at developing cognitive, psychological, affective, motor-sensory aspects, by also allowing for the acquisition, through the experience, of some *motor schemes* like walking, body balance and coordination of upper and lower limbs;
- A *water education* aimed at developing the functional morphological sphere, and at facilitating the adaptation to the water environment (and *not* the teaching of swimming techniques).

The child's development, from his first months of life, must be assessed globally, by taking into consideration the physical and psychological aspect in all the basic components: that neuromotor, cognitive, and affective-relational. In the first years of life, perceptive-kinesthetic stimulation and movement, in a favorable emotional climate, are essential requisites for motor, cognitive, affective and relational development, and contribute decisively to the optimal development and full realization of human potentialities.

The positive effects of an early water motor stimulation (adjusted to the age) on the intellectual processes are found above all in the improvement of attention capability, behavior and autonomy. (Zimmer, 1990; Miller, 1973; Erikson, 2003).

Water activity is rich in exteroceptive (tactile) and proprioceptive (kinesthetic and labyrinthine) sensations, and is an excellent tool for stimulating and developing perceptive and motor systems.

The plurality and variety of the stimuli offered in this unusual situation, in the first years of life, enriches the heritage of "backgrounds" (Bernstein, 1989), i.e. the perceptual and motor experiences that the child uses, in the sensorimotor period (up to 2 years), to build up his motor skills by favoring cognitive development (Piaget, 2000).

The optimal age for the approach to water is around the 3 months of life. The child has not yet received negative influences, nor he has developed anxieties and fears (which instead characterize the 8/10 months), allowing shortening the adaptation processes, favoring the development of potentialities and a global and balanced growth, facilitating the establishment of a good relationship with water useful to ensure a certain autonomy. This autonomy is not only introductory to a future teaching of how to swim, but it is also functional to the prevention of possible accidents.

The water environment is used as a stimulus to psychomotor development and to enrich the children's emotional and perceptive baggage through play experiences, mediated by the mater-

nal / paternal figure: the most suitable person to mediate the approach with the new and unusual experience in an emotionally favorable climate.

The general purpose of neonatal water movement is *the development of children's potentialities*. The strengthening of the parent-child bond promotes: security, self-confidence, self-esteem, autonomy, ability to interact, socialize, manage anxieties and fears, and respect for the first behavioral rules.

The continuous adjustment to the characteristics of the new environment allows also maintaining a high level of attention and discovering new motor *patterns* of both locomotor and postural type, useful in everyday life too (Evans & Sleap, 2012).

Physical Benefits. Motor activity carried out into the water promotes the production of endorphins in the body, chemical substances that have positive effects on the general humor of the human being and on the regulation of sleep, with the consequent decrease of anxiety and stress and the increase of general psychophysical and emotional well-being.

The immersion into the water allows people with motor difficulties performing certain movements that are difficult to be performed on the ground (Bertini, 2005, Pacelli, 1991).

Already at an early age, this experience promotes the improvement of muscle control and general coordination, balance and posture; moreover, it promotes relaxation, physical and mental health to keep the body active and accustom the child to the importance of movement, promoting a greater security and autonomy in *terrestrial motor patterns* (Scurati et al., 2016).

Psychological Benefits. By stimulating the problem-solving ability, neonatal water movement allows the child gaining greater confidence in the things he does and towards himself, helping strengthening confidence in his potentialities and in others (Pacelli, 1991). Moreover, by experimenting with one's own abilities and skills, with one's own possibilities and limits, one acquires greater self-knowledge by encouraging the development of self-regulation and self-efficacy capabilities (Piredda, 2012). Positive effects are also found on the stimulation of intellect and creativity (Piredda, 2012).

Recent studies have shown how physical activity can stimulate the growth of new cells in the hippocampus, the brain structure that controls memory and learning (Erickson et al, 2011; Olivieri, 2017). Motor activity carried out into the water develops learning capabilities, thus improving levels of understanding and cognitive capabilities (Jorgensen, 2012).

Affective-Relational Benefits. By getting in touch with teacher, parents and other children, during the activity, there are multiple interactions that correspond to the complex panorama of relationships which allow the subject experiencing a wide range of feelings and emotions, managing any relationship conflicts and learning to adapt relationship to the people with whom he interacts. In the interpersonal relationships, the subject has his own goals and a specific role, thus enhancing the process of personal identity building (Guiggi, 2012).

The *skin-to-skin contact* into the water, as on the ground, strengthens the bond between parents and children, becoming a valuable opportunity to spend quality time useful not only to establish a good mother / father / children relationship, but also to be familiar with the water in order to increase *the children's sense of security and trust*

By learning to act safely into the water, it is possible to develop self-esteem, mental health and the serenity necessary to carry on the activity with joy and satisfaction (Moody, Hale, & Waters, 2012).

Socio-relational benefits. In fact, the neonatal water movement experience becomes the child's first social activity. Even if they do not initially interact with each other, it can still be considered a social activity as it offers the peers and their parents the possibility of sharing spaces, experiences, regular times and the acquisition of rules, contributing to the realization of one's own performance and that of everyone (Di Palma et al, 2016).

It also turns out to be a further motivating factor for the whole family as it also offers parents the opportunity to make friends, feel part of a group, form networks of mutual help and solidarity also useful for promoting inclusion (Rowe & Kahn, 1998; Steverink & Lindenberg, 2006).

The figure of the teacher

The teacher plays a central role in the lives of children and parents during neonatal water movement, and is considered a very important and essential figure for facilitating participation (Fisken et al.2015), thanks to his abilities to make the lessons pleasant (especially from the emotional point of view), and effective (from that physical) (Evans & Sleap, 2012; Moody et al., 2012).

Through the proposal of corporeal perception exercises it is important that the teacher positively influences the sense of self-efficacy by experimenting, for example, unusual actions and variations of the proposals that favor positive emotions (McAuley, Blissmer, Katula, Duncan & Mihalko, 2000).

The teacher, a fundamental figure, is a guide that reassures parents, suggests games and catches, and gradually becomes part of the parent-child relationship, gaining the child's trust and thus creating the conditions for the separation and the total future care of him that would take place in two or three years.

Conclusions

By combining free play and structured activity, neonatal water movement (3 months / 3 years) is a good physical activity important for the child's development, for his health, self-perception, social skills, school preparation and educational success.

We can consider the following points as *the Core aspects* of this activity:

- the recreational proposals that promote a better awareness of the corporeal self;
- The problem-solving strategies based on the stimulation of experience in water, considering every subject's individuality and characteristics.

A strong incentive to the movement is given in the child by the perception of corporeal and mental progresses that help him acquire better security, a sense of self-efficacy and self-esteem also through an improved ability to reduce potential risky situations, such as drowning and environmental hazards.

In this sense, the culture of the body can assume, both in the child and in the adult/elderly, the same pedagogical value of an intellectual culture that enriches and educates globally, consistently with the most current theories of the *physical literacy* (Delaney, Donnelly, & News, 2008), intended to promote: the understanding of the importance of physical activity as a lifestyle and its positive implications for health, the motivation and a concrete continuity in the practice of physical-motor activities throughout life.

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