

The role of the physiotherapist in pediatric obesity prevention: comparing experiences

Ruolo del fisioterapista nell'obesità infantile: esperienze a confronto

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ABSTRACT

Background: Obesity is an emerging issue with serious health consequences. It is preventable in pediatric settings through prevention projects and education about healthy lifestyles. The aim of the study is to analyze the problem and the methods of intervention, through the involvement of physiotherapists throughout Italy, and to explore the interest and sensitivity of Italian physiotherapists to the issue.

Study design. A cross-sectional survey of physiotherapists was conducted using a self-completed online questionnaire, from January to March 2020.

Materials and Methods: Literature analysis searching for national and international prevention strategies. Administration of a cognitive questionnaire to the pediatric GIS group.

Results: Ninety-five point seven percent of the interviewees had never taken part in projects dedicated to pediatric obesity. Three experiences emerged, but only two respondents made themselves available for interview. Ninety-four point four percent of the operators considered the contribution to the health problem useful and 82.2% of them expressed a real interest in the topic.

Conclusions: Physiotherapists should play an active role in planning interventions aimed at promoting and supporting healthy lifestyles from early childhood to early adulthood, starting even earlier during the prenatal and perinatal periods.

Key words: Pediatric obesity; prevention; physiotherapist; physical activity.

Background: L'obesità è una problematica emergente, con gravi conseguenze di salute. In ambito pediatrico è prevenibile attraverso progetti di prevenzione ed educazione a corretti stili di vita. Lo scopo dello studio è quello di analizzare il problema e le modalità di intervento, tramite il coinvolgimento sul territorio nazionale della figura del fisioterapista, sondare l'interesse e la sensibilità dei fisioterapisti italiani nei confronti della tematica.

Disegno dello studio: Un'indagine trasversale sui fisioterapisti è stata condotta utilizzando un questionario online auto-compilato da gennaio a marzo 2020.

Materiali e Metodi: Analisi della letteratura ricercando strategie di prevenzione nazionali e internazionali. Somministrazione di un questionario conoscitivo al gruppo GIS pediatrico

Risultati: Il 95,7% degli intervistati non ha mai preso parte a progetti dedicati all'obesità pediatrica. Sono emerse tre esperienze, ma solo due intervistati si sono resi disponibili per l'intervista. Il 94,4% degli operatori ha ritenuto utile il contributo del fisioterapista al problema sanitario e l'82,2% di essi ha espresso un reale interesse per l'argomento.

Conclusioni: I fisioterapisti dovrebbero svolgere un ruolo attivo nell'ambito della prevenzione, tramite la progettazione di interventi volti a promuovere e sostenere corretti stili di vita, dalla prima infanzia alla prima età adulta, iniziando anche prima, durante il periodo prenatale e perinatale.

Parole chiave: Obesità infantile; prevenzione; fisioterapista; attività fisica.

INTRODUCTION

A study conducted by the Imperial College of London and the World Health Organization (WHO), published in *The Lancet* in October 2017, shows that over the past 40 years the number of obese children and adolescents (aged 5-19 years) has increased tenfold.¹ Italy was among the nations with the highest rates of childhood obesity.

Overweight and obesity are defined as an abnormal or excessive accumulation of fat to the extent that it may impair health, usually due to a sedentary lifestyle and an unhealthy diet leading to an energy imbalance between calories ingested and consumed.² Primary or essential obesity accounts for at least 90% of all cases of obesity in children and adolescents, with a steadily increasing incidence. Only a small percentage of childhood overweight is secondary to specific genetic, iatrogenic or endocrine causes. In general, these are hetero-

geneous and multifactorial diseases, with both environmental and genetic factors contributing to their development.^{3,4} In addition to genetics, obesity is influenced by pregnancy-related factors such as exposure to smoking, weight gain during pregnancy, birth size, catch-up growth, breastfeeding and drug prescription.⁵⁻⁹

Environmental factors such as parental eating behaviour, school environment, sleep and emotional distress also play a role. Obesity, particularly in children, leads to short and long-term complications such as hypertension, dyslipidemia, impaired glucose homeostasis and insulin resistance, type 2 diabetes, metabolic syndrome, and musculoskeletal problems.¹⁰

Overall, childhood obesity is associated with an increased risk of premature death and disability in adulthood.^{3,5,11,12} Some authors^{13,14} suggest that pediatric obesity itself may have an impact on health independently of adult weight.^{10,15,16}

There are many tools for assessing obesity, the most common and easiest to use are body mass index (BMI) calculations and abdominal circumference measurements.¹⁷

When considering the pediatric age, BMI typically decreases after birth, then increases during the first 6-8 months and decreases again until 5-7 years of age, which corresponds to a decrease in body fat percentage that then gradually increases to adult levels. Age and sex-specific percentile curves are adopted, due to the wide BMI variability.

In detail, for children up to 24 months of age or whose height is more than 2 standard deviations below the population mean,⁴ the diagnosis of obesity is based on the weight/length ratio (Table 1).

In children aged over 24 months, the diagnosis of obesity is based on the BMI: weight (kg)/height (m²) (Table 2).

In order to tackle the obesity epidemic, prevention would seem to be the most promising tool and, in this view, the role of the physiotherapist becomes crucial.

NATIONAL AND INTERNATIONAL POLICIES ON PEDIATRIC OBESITY PREVENTION

On the topic of childhood obesity, the WHO established the Commission to End Childhood Obesity, with the aim of identifying the effectiveness of the various approaches and interventions proposed around the world. In 2016, the Commission produced a report with six recommendations to promote lifestyles that address childhood obesity, starting as early as the prenatal and perinatal periods. A further WHO initiative was the European Childhood Obesity Surveillance Initiative (COSI), which measures rates of overweight and obesity among school-aged children, allowing comparison between all participating countries (more than 30, including Italy).¹⁸⁻²⁰

In Europe, the most relevant document is the Action Plan on Childhood Obesity 2014-2020, which provides a series of basic guidelines distinguishing eight priority areas of intervention with

the aim of promoting a healthy lifestyle from birth. This document seeks both to inform and empower families as well as to assess the impact of the phenomenon and strengthen research.¹⁸

Focusing on the Italian territory, the new National Prevention Plan (PNP) 2020-2025 intends to strengthen the interdisciplinary approach, promoting continuous training of health professionals also in terms of brief advice on lifestyles, identification of risk conditions for chronic non-communicable diseases and adequate 'care taking', fostering the interaction with the National Chronicity Plan (PNC).^{3,21}

In view of the PNP objectives, two national programs are included: "Guadagnare Salute", whose first aim is the prevention and control of chronic diseases, promoting healthy lifestyles with a focus on the main risk factors of chronic-degenerative diseases.²²

OKkio alla Salute, a surveillance program on the weight status of primary school children (6-10 years), on lifestyles, eating behaviors, physical exercise attitudes, as well as on school initiatives promoting physical activity and healthy eating.²³

THE ROLE OF PHYSIOTHERAPISTS IN THE PREVENTION OF PEDIATRIC OBESITY

The Canadian Physiotherapy Association (CPA), after consultation with selected stakeholders' groups, identified the importance of physiotherapists in the primary care of pediatric obesity, and therefore published a document entitled "Physiotherapists and the Management of Obesity" in 2007.

In 2016, the IOPTP (International Organization of Physiotherapists in Pediatrics), in response to the final report of the World Health Organization Commission to End Childhood Obesity, states that each recommendation of the WHO report is of interest to physiotherapists who, therefore, are encouraged to consider their role in health promotion, and in the prevention as well as treatment of childhood obesity.

The physiotherapist becomes a promoter of childhood obesity prevention in terms of:

- encouraging healthy eating
- promoting physical activity and discouraging sedentary behavior in children and adults

Regarding the relationship between obesity and physical activity, the early years of life are essential to undertake preventive

Table 1. Cut-off values with reference to the international tables, published by the World Health Organization (WHO) in 2006.

	WHO 2006	
Overweight risk	>85° percentile	1 SD
Overweight	>97° percentile	2 SD
Obesity	>99° percentile	3 SD

Table 2. Cut-off values with reference to the World Health Organization (WHO) 2006 tables for age 2-5 years, the WHO 2007 tables for age 5-18 years, and the Italian Society of Pediatric Endocrinology and Diabetology (SIEDP) 2006 tables for age 2-18 years.

	Age 2-5 years WHO 2006	WHO 2007	Age 5-18 years SIEDP 2006
Overweight	>85° percentile	>85° percentile	>75° percentile
Obesity	>97° percentile	>97° percentile	>95° percentile

approaches that can have an impact on lifestyle and the development of overweight or obesity. The WHO 2020 guidelines recommend 60 minutes of moderate-intensity aerobic activity per day for children/adolescents in the light of a decrease in sedentary activities combined with good sleep hygiene.

In detail:

- infants and young children not yet independent in movement, when awake, at least 30 minutes of prone positioning, spread throughout the day; in a sitting position, storytelling should be encouraged, thus avoiding exposure to screens/displays; sleep until 3 months of age should cover 14-17 hours/day, gradually decreasing to 12-16 between the period 4-11 months.
- children between 1 and 4 years of age should spend at least 180 minutes/day on the move; screen time should be discouraged (maximum 1 hour/day at 2 years of age); sleep should cover 10-13 hours/day at fixed times.

In Italy, in order to have data on these important early health indicators, the Children's 0-2 years Surveillance program is currently operational and collects information on children's health. These reports reveal that 34.3% of children under the age of 6 months, 64.1% of those between 6 and 12 months and 76.4% of children over one year old spend time in front of the TV, computer, tablet or mobile phone. Exposure time also increases with age: although most exposed children, both younger and older, spend less than one hour a day in front of a screen, those who spend at least 1-2 hours in front of a screen increase from 8.7% in the age group up to 6 months to 31.5% over 12 months.²⁴

The physiotherapist, who recognizes skills at all levels of prevention, is an important resource and could play a more distinct role in pediatric obesity.

The purpose of our study was to investigate, through the administration of a questionnaire to the therapists enrolled in the AIFI Pediatric GIS, the involvement of physiotherapists in Italy in relation to the problem of pediatric obesity, to identify any projects carried out and to explore the interest of Italian physiotherapists in this issue. At the same time, the study, through the analysis of existing experiences and a deeper understanding of the topic, intends to be a starting point for the AIFI Pediatric GIS for a future health education project.

MATERIALS AND METHODS

Study design

A cross-sectional survey of physiotherapists was conducted using a self-completed online questionnaire from January 2020 to March 2020.

Participants

All participants of the Pediatric GIS group of the Italian Association of Physiotherapists (AIFI). The number of members of the pediatric GIS in 2020 was 243; we asked them to forward the questionnaires to their contacts.

Questionnaire development

Considering the research conducted and the demands that emerged within physiotherapy clinical practice, a cognitive questionnaire was created, structured through Google Questionnaire, it was then forwarded to all participants of the Pediatric GIS group

of the AIFI. The construction of the questionnaire was inspired by the IOPTP model proposed in 2016, with due adjustments related to the different needs and purposes. The questionnaire was composed of 19 questions, some of which were open-ended, investigating the level of awareness and consciousness regarding the obesity issue, the commitment to dedicated projects, and in general the interest in the topic with the relevance of the role of the physiotherapist on this issue.

Questionnaire distribution

The invitation to complete the questionnaire was sent to all participants of the Pediatric GIS group of the AIFI, with a request to extend it to their contacts to maximize the response rate. The invitation letter briefly introduced the problem and described the purpose of the study. The invitation also included instructions for completing the questionnaire.

Statistical analysis

For all variables, descriptive statistics were used using SPSS version 25.

The percentages were calculated based on the answers to each question, excluding unanswered questions.

RESULTS

Pediatric obesity questionnaire

Seventy-three physiotherapists answered the questionnaire, but it was not possible to trace the total number of questionnaires sent (the number of members of the pediatric GIS in 2020 was 243).

The most interesting aspects that emerged from data analysis are as follows:

Training in pediatric obesity

Lack of training regarding pediatric obesity: 54.8% of operators had not received any specific training on the topic; of the remaining percentage, 30.1% had studied the topic in detail independently, 12.3% followed FAD courses and 5.5% received brief in-service training, a very small percentage (2.8%) were informed of the Pediatric Physiotherapy Master's degree.

Work experience

Work experience with overweight and obese patients concerned mainly the adult population: only 39.1% were adolescents and 30.4% were children.

Multidisciplinary approach

The need for a multidisciplinary approach is already evident. In fact, in 58,7% of the cases there was the involvement of other professionals such as: psychologists, endocrinologists, nutritionists, dieticians, nurses, cardiologists, social and healthcare workers (OSS), paediatricians, surgeons, nutritionists/dietologists, teachers, motor science professionals, orthopedists, social workers, physiatrists, internists, child/ pediatric neuropsychiatrists, general practitioners, speech therapists for nutritional plans, general practitioners (mmps/pls), pneumologists.

Methods of treatment

Different intervention modalities are present: individual outpatient treatment (57.8%) and group treatment (6.7%) as well as inpatient treatment (28.9%). Group treatments for children and families and dedicated residential camps emerge as isolated experiences.

Prevention projects

Another interesting aspect which emerged from the questionnaires collected was the discovery of three prevention projects in which the physiotherapist was involved: two in Piedmont and one in Tuscany. The experiences of the Piedmont centres are as follows.

The Alessandria Hospital experience (the AO AL hospital experience)

This experience was the result of a joint project against obesity in childhood and adolescence activated by the Complex Hospital Structure (SOC) of Pediatrics during the period 2014/2016 in collaboration with the Rehabilitation Service. The aim of the project was to try to overcome the classic prescriptive therapy based on diet and calorie restriction with an integrated path of psychological, neuropsychiatric, clinical and rehabilitation support with an educational and motivational approach centred on the family. The project developed following two different paths: a three-month outpatient program and a three-week inpatient family-room program. The aim was to accompany the families involved to higher levels of self-efficacy and self-management (EFTE: Empowering Family Therapeutic Education; RME: Empowering Metabolic Education), with the simple and basic “therapeutic” advice to do more movement/exercise and eat better with the philosophy “I support you, I don’t control you”.

The three-week inpatient course involved only two cases: S., 14 years old, with severe metabolic syndrome and O., 4 years old with genetic syndrome. S and O. were admitted to the Family Room, an independent space in the hospital, where minors can stay together with a family member. From the physiotherapeutic point of view, two daily accesses to the gym were scheduled with variable timings, possible thanks to the collaboration of the volunteers of the Association of Hospital Volunteers for Children (AVOI) involved in the project. Each program was customized and elaborated with the family, adapted during the course of the project, with the preparation of strategic motivational movement and play activities settings. Shopping and mealtimes, sometimes shared with some members of the team, were part of the educational approach. S., as a first case, was involved in the development of the project itself. She was therefore subjected to evaluation scales (walking test and Borg), aerobic exercises (Wii platform programs, dance, walking and jogging in the gardens or on treadmills), self-massage programs, stretching, yoga exercises. In terms of nutrition, efforts were made to broaden the choice of food, making it more mindful and responsible. The improvements at the end of the course were evidenced not only by weight loss (-8 kg) but also in terms of increased energy, quantity and quality of movement, as well as a general reduction in pain. In the follow-up at six and twelve months, S. had lost further weight and maintained, with the support of the family, the new attitudes. The second case in the project (O.) also gave positive feedback in terms of increased general movement, participation to group activities, proactivity and seeking interaction. At the 12-month follow-up, O. had no weight gain, had maintained the dietary supplementation of fruit and vegetables, eliminated sweet drinks, and improved sleep quality.

Seven patients aged 6 to 11 years were enrolled from the outpatient obesity clinic. The psychologist, paediatrician and neuropsychiatrist offered the families an educational course, a behavioural therapy course and a group parenting support course. The physiotherapists’ role in this course was to motivate the children to move. The physiatrist for a global assessment of osteoarticular health then visited each child recruited. At the beginning and end of the course, each child was tested for physical capacity, walking ability and fatigability using the Borg scale and the Shuttle test (a modified walking test, a 30-metre run to exhaustion with lap count, and monitoring of pressure and frequency). In addition to their function as indicators of variations-increases in functional capacity, the tests were valuable opportunities to stimulate and motivate the children, familiarize with their individual personalities, and create groups in a positive and fun atmosphere. There were 12 weekly meetings led by two/three physiotherapists, over three months, lasting about one and a half hours per meeting. Each session included an initial and final plenary activity, with several activities, on which to rotate individually. The program integrated shuttle tests, abdominal breathing exercises, gentle gymnastics and global stretching, activities chosen by the children performed with the Nintendo Wii console, as well as aerobic activities on treadmills and laughter yoga. The initial and final relaxation moments were an opportunity for the children to listen to their personal problems. At the end of the course, feedback of the experience was provided for parents and other team members, commented directly by the children through a presentation of slides prepared by the physiotherapists.

The Fossano experience

The “Mountain and Childhood Overweight” project involves the promotion of sports activities in mountain locations as a secondary prevention strategy for pediatric obesity. The initiative takes inspiration from a similar project which has already been successfully addressed, aimed at nutrition, behavioral and health education in childhood and juvenile diabetes.

The project “Mountain and Childhood Overweight” was conceived and proposed by the Medical Commission of the Italian Alpine Club (C.A.I.) of Liguria, Piedmont and Valle d’Aosta (L.P.V) and intends to collaborate with the Pediatricians of the Fossano District of ASL Cn1. They will be asked to raise awareness and inform their patients, in agreement with their parents, of children and young people (aged between 8 and 14) suffering from non-severe obesity or overweight identifiable as the cause or effect of a hardship (family, school, social...), inviting them to join the project. The project plans to recruit 8-10 children between the ages of 8 and 14, divided into two age groups: 8/11 and 12/14. A wide range of stakeholders will be involved in the project, from various health professionals to alpine environment experts.

The enrolled participants will be accompanied by a working group (made up of paediatricians, nurses, psychologists/educators, pediatric physiotherapists and dieticians, guides from the Fossano section of the CAI (Italian Alpine Club) and instructors from the Fossano Athletics Society), in “school camps” at mountain shelters in the province of Cuneo during the summer. During the trips and recreational activities, an attempt will be made to instruct participants towards a personalized and correct diet, supplemented by modulated physical exercise with the aim of reducing overweight in the medium term. There will be a preparatory phase in which fitness parameters will be assessed in terms of the 6-minute walking

test, the time and speed taken to cover one kilometer on an athletics track, and a questionnaire on eating habits will be administered. These evaluations will then be repeated at the last meeting to check for any improvement in physical performance. The summer camp program includes 4 days of shared meals, daily walks and afternoon and evening activities.

The effectiveness of the methodology adopted will be evaluated in relation to the improvement of physical performance, the interest and motivation aroused in the participants by physical activity in a mountain environment, the maintenance and attention to hygiene and healthy living standards as well as the observation of the school camp nutritional proposals.

DISCUSSION

The results of the study demonstrate the role that physiotherapists could play in the management of obesity in the pediatric population. The role of physiotherapists in health promotion, prevention and treatment of childhood obesity is predominant in scientific publications;¹⁸⁻²⁰ however, the study underlines a lack of training for these professionals. More than half of the respondents stated that they had not received any specific training on the subject other than through independent training. The professional training needs that emerged in our study are aimed at strengthening skills related to disease and physiology knowledge, prevention in the newborn and infant and to the treatment plan.

Literature reports the need for experienced pediatric professionals capable of providing age-appropriate physical activity interventions based on the unique physical and psychosocial needs of children,²⁵ and physiotherapists are the most appropriate professionals for this purpose. It is therefore essential to expand pediatric content training in physiotherapy curricula,²⁵ including content specific to childhood obesity.

The use of a multi-component behavioral program carried out by a multidisciplinary team is considered best practice and has been shown to be effective in the treatment of childhood obesity,²⁶ in agreement with the results of our study which underline the need for an integrated approach by multiple professionals.

The considerable interest in conducting multidisciplinary interventions can be linked to WHO guidelines on diet, physical activity and health;²⁷ recognition of the increasing burden of non-communicable diseases such as obesity, has led governments to recommend the promotion of applied research, with intervention programs aimed at improving diet and/or physical activity.²⁷

Multicomponent interventions are further supported by previous NHMRC guidelines;²⁸ part of the multidisciplinary team includes physiotherapists who have an important role and expertise in both physical activity and exercise, but also in understanding the barriers that may affect an individual's ability to make positive lifestyle changes.²⁸ Our study presents some prevention projects activated in Piedmont which demonstrate the importance of physiotherapists in implementing multidisciplinary interventions aimed at modifying the behaviour of pediatric patients, with the involvement of families, towards health improvement through fun, engaging and age-appropriate activities.

Physiotherapy is continually evolving and provides a holistic approach to the prevention, diagnosis and therapeutic management of motor difficulties related to childhood obesity.

Although physiotherapists have been identified as health professionals suitable for the care of children with obesity, a cross-sectional survey on trends in physiotherapy practice and professional needs found that only half of the physiotherapists providing care to pediatric patients provided specific services to children with overweight or obesity.²⁹ This result is consistent with that of our study in which physiotherapists report having little experience with the pediatric population in relation to the treatment of obesity.

There are many barriers to the treatment of childhood obesity, such as: difficulties in family involvement, lack of motivation, lack of time, inflexibilities also present in the medical environment, inadequacies of the health care organization and costs. In addition to this, there are the obvious difficulties and complexities of multi-dimensional treatment with a behavioural approach to childhood obesity. The development and implementation of this type of intervention require a combination of cognitive, behavioural, psychomotor and caring domains; by establishing a multidisciplinary network, each patient would be followed in a specific and personalized manner.

LIMITS

The results of this study must be considered in the light of sampling limitations. The survey was also limited to physiotherapists who were members of the pediatric GIS. As the questionnaire was disseminated to the GIS members, the data on the number of invitations made were missing for the calculation of the response rate. In addition, the questionnaire proposed a limited number of questions: partially this choice penalized the in-depth study of certain topics but facilitated the acceptance of the questionnaire. Respondents reported working in a variety of settings and not exclusively with pediatric patients. Nevertheless, we did not research or analyze these subgroups separately; future research should consider the different perspectives of physiotherapists working in inpatient and outpatient settings and exclusively with pediatric populations.

CONCLUSIONS

The pediatric physiotherapist as an expert in the child's neuro-psycho-motor development must inevitably become a promoter of health, empowerment and prevention. The Piedmont projects that emerged from the survey are therefore in line with these principles. The answers that emerged from the questionnaire lay the base for future involvement of the Pediatric GIS in the primary and secondary prevention of childhood obesity, in collaboration with families, schools and paediatricians. As widely evidenced in the literature, physiotherapists' interventions should therefore start from the breastfeeding phase and accompany the child's growth into adulthood.

ANNEX 1: QUESTIONNAIRE

The WHO considers obesity to be the most important problem in childhood and defines it as a real alarm. With the aim of evaluating, through a nation-wide survey, of the role of physiotherapists in the prevention and treatment of obesity and overweight in childhood, we ask you to fill in the short questionnaire below. The results will become part of a study project for the thesis of the Physiotherapy degree course, in Novara.

1. Are you aware that obesity and overweight are an alarming emerging problem in our country?
 - YES
 - NO
2. Are you aware that this problem mainly affects children?
 - YES
 - NO
3. Are you aware of the existence of projects concerning the "Taking care" of these children/adolescents?
 - YES
 - NO
4. If YES, which one?.....
5. Are you aware of the importance of adequate nutrition in infants and young children to prevent this problem?
 - YES
 - NO
6. Where do you work as a physiotherapist?.....
7. In what context do you mainly work?
 - public
 - private
 - contracted-private
8. Do you work exclusively in pediatrics?
 - YES
 - NO
9. Do you have or have you had experience of working with overweight or obese people?
 - YES
 - NO
10. If YES, were they.
 - Adults
 - Adolescents
 - Children
11. It was...
 - A sporadic experience
 - An experience within a project
 - Work in a specialized center
12. Which intervention modality was used?
 - Individual outpatient treatment
 - Outpatient group treatment
 - Inpatient treatment
 - Group treatment for children and families
 - Residential camp for obesity
 - Online treatment program (administered via computer)
 - Other.....
13. Has the intervention included/includes collaboration with other professionals (multidisciplinary team)?
 - YES
 - NO
14. If YES, which professionals?.....
15. What kind of training have you had in relation to the obesity topic?
 - No training
 - Self-directed study
 - Short in-service training
 - FAD training
 - Other.....
16. Have you participated in any projects or research on childhood obesity?
 - YES
 - NO
17. If YES, please provide details.....
18. Are you interested in the topic?
 - YES
 - NO
19. Do you think that physiotherapists can contribute in taking care of the problem through their own projects?
 - YES
 - NO

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