



Invited Editorial

Physical Activity and Physical Fitness in Pediatric Obesity: What are the First Steps for Clinicians? Expert Conclusion from the 2016 ECOG Workshop

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ABSTRACT

International Journal of Exercise Science 10(4): 487-496, 2017. One of the main aims of the European Childhood Obesity Group (ECOG) is to assist healthcare workers in delivering evidence-based assessment and treatment of childhood obesity. Every year the ECOG Congress includes working groups whose objective is to highlight concerns faced by clinicians and practitioners who work in the field of pediatric obesity. This year, a working group was devoted to the assessment of physical activity and physical fitness in this population. The present commentary attempts to summarize the main themes identified by practitioners during these workshops in order to provide the basic and essential first steps required to address physical activity and fitness in children with obesity.

KEY WORDS: Physical activity, physical fitness, clinical assessment, pediatric obesity

INTRODUCTION

Poor diet and a sedentary lifestyle with a lack of physical activity and suboptimal physical fitness play a pivotal role in the development of chronic diseases such as type 2 diabetes, cardiovascular diseases, some cancers and orthopedic complications. Obesity is a crucial determinant of these diseases. With more than 42 million children under the age of five with obesity worldwide (WHO), there is a pressing need to adequately address the multitude of driving forces at a global level. However, at the same time, state-of-the-art diagnostic and evidence-based therapeutic procedures have to be available for the individual patient.

A remit of the European Childhood Obesity Group Congress is to assist healthcare workers in delivering evidence-based assessment and treatment of childhood obesity. For the last number of years, specific ECOG working groups have been conducted addressing physical activity (PA) and physical fitness (PF). During the annual meeting in Thessaloniki, Greece (October 2016), a workshop was convened to address physical activity and fitness in the area of childhood obesity. The discussions that developed during the workshop clearly highlighted the major concerns faced by clinicians and practitioners who work in the field of pediatric obesity but who are not specialized in assessing or addressing physical activity and physical fitness.

The available literature supports the central role for physical activity and play in child health and development. In addition, there is a large body of evidence addressing the beneficial effects of regular physical activity (in addition to healthy nutritional habits and behaviors and adequate sleep) for the prevention of pediatric overweight and obesity (25). By focusing on the physical activity levels of children and youth, not only do we intend to increase daily energy expenditure, but we also aim to maintain and improve physical fitness, i.e. functional capacities (motor skills, musculoskeletal, metabolic and cardiovascular structures and functions, etc.).

While public health recommendations for health-enhancing physical activity are largely aimed at maintaining and promoting general health and well-being in children and adolescents, it must be clearly noted that they are not aimed at inducing weight loss or for treating pediatric overweight, obesity and their associated metabolic and physical comorbidities. In essence, it is essential that clinicians consider the guidelines for physical activity as 'threshold' levels recommended for healthy childhood growth and development. Reaching these levels for any sedentary child is a key primary goal. In order to treat childhood obesity and its related comorbidities, moving beyond these thresholds may be necessary though achieving these may be challenging and will often require adapted techniques and therapeutic exercise strategies.

As part of its activities, the ECOG facilitates practical workshops during its annual scientific meeting, in an attempt to address the practical issues and barriers reported by clinicians and practitioners working in the field of pediatric obesity. The contemporary evidence together with national and international policies recommend that pediatricians and other healthcare practitioners promote appropriate behavior change within the family in an effort to prevent

and manage childhood obesity (5) (10). Key changes include limiting screen time, increasing physical activity and sleep and adopting healthy eating behaviors. Such targets should be an integral part of regular counseling, however practitioners report that encouraging such change is difficult to achieve in their daily practice.

Although pediatricians are perceived by most parents as valued advisors concerning their children's weight management (16) (18); they face a number of barriers which can limit their weight-related counseling and the referral to and delivery of lifestyle-based treatment.

Considering the very first step, most pediatricians and practitioners express difficulty explaining to parents that the existence of childhood obesity is a familial challenge which requires behavioral adaptations (16) (7) (17). In addition, the time needed to raise the issue sensitively and the resources required to address treatment effectively are often unavailable to practitioners. Practitioners are aware of the limits of their competencies but do not know how to improve this background: they report an actual lack of competence in delivering effective treatment (31) (15). Practitioners' confidence and competence are essential for establishing an authentic and trusting relationship and for preventing the stigma or discrimination that too often leads to iatrogenic effects in medical care (32) (14) (8) (19). Such barriers explain why pediatricians and practitioners often express a lack of effective counseling skills (23) (25) (33) (19). Indeed several authors have noted that there is a pressing need to increase the core treatment skills, self-confidence and efficacy related to pediatric obesity assessment and treatment (19).

Table 1. Self-assessment for obesity practitioners on physical activity and fitness.

Steps	
1	Determine how you define physical activity <i>What does health-enhancing physical activity mean to me?</i>
2	Identify a basic measure of the patients physical activity level <i>Does my patient reach the daily physical activity recommendation for his/her age (>60 minutes of mod-vigorous activity per day for those 6-18 yrs; 3 hours per day for those <6 years)</i>
3	Explore the determinants of physical activity for each patient <i>Family and peers: For how many days per week and for how many minutes each day does the child engage with family members or friends in active play, sport, exercise or active hobbies?</i> <i>Environment: Are there safe areas for the child to play (e.g. parks, cycling tracks or games areas near the home or school)? How far from school does the patient live? How does he/she go to school every day (cycling, walking, bus, car)?</i>
4	Identify the time devoted to sedentary behaviors <i>How many minutes/hours does your patient report sitting each day? For how many minutes/hours does the patient use screens (TV, laptop, smartphone, tablet, video console, Internet) per weekday and weekend day?</i>
5	Determine whether there are barriers to movement: <i>Does your patient report any difficulties in performing childhood activities of daily living (e.g. climbing stairs, tying shoe laces, showering, jumping, skipping, walking, running, playing team games, carrying bags, etc.)?</i>
6	Determine whether additional assessment and treatment will be required: <i>Do you have any indication that the child has physical or psychosocial barriers that might limit participation in physical play? Do you have access to a physiotherapist or exercise physiologist who can provide assessment and treatment? Are you aware of evidence-based childhood obesity treatments/interventions in your area?</i>

Practitioners, despite their commitment and willingness to be involved into the prevention or treatment of childhood obesity expressed a lack of knowledge regarding the physical

impairments and difficulties associated with obesity, and especially tools that would allow simple and effective assessment of them. These debates and discussions pinpointed the necessity to provide such professionals with the first necessary steps to facilitate a basic assessment of physical activity, physical fitness and physical function in children and adolescents with obesity. The present commentary attempts to summarize the main themes identified by practitioners during these workshops in order to provide the basic and essential first steps.

Importantly, it has to be noted that the objective of the commentary is not to provide practitioners without formal accredited training in the fields of physiotherapy, exercise science sports medicine or exercise physiology, the knowledge and skills to prescribe motor tests, physical activity programs or exercise training. Rather, we aim to ultimately reinforce the necessity for practitioners to adequately consider the role and importance of activity and fitness when it comes to assessing obesity in youth; and to encourage a greater understanding of when and to whom an onward referral may be necessary.

COMMON GAPS IN PRACTICE RELATED TO PHYSICAL ACTIVITY

When questioning practitioners on how they tend to assess a child's physical activity level it became evident that structured physical activities were usually considered as the main opportunity for energy expenditure in children. Practitioners reported questioning the child, the adolescent or parents about engagement in physical exercise sessions such as physical education classes or sport club sessions. On the other hand, very rarely practitioners elicited information regarding active free play, or active transport (walking or cycling to school). Similarly, very few explored whether their patients were at the very least reaching the age-related recommended levels for activity and sedentary behavior (20). From the initial discussion it became clear that a consensus understanding regarding the definition of physical activity was required.

While structured physical activity sessions (i.e. targeted games and exercise training sessions) are part of weight management programs to beneficially improve body composition, metabolic profile, psychological profile and functional capacities, daily physical activity and active play must be promoted in order to promote longer-term weight management and avoid the progression of co-morbidities. Any bodily movement that requires muscle work thus increasing energy expenditure above the resting metabolic level has to be encouraged in first instance. Before considering any specific physical activity intervention, practitioners must promote daily active play and movement by also setting goals aimed at reducing sedentary behavior. Although encouraging active play and movement in youth appears to be the first logical and natural step, it is important to keep the goal of activity recommendations in mind. While both parents and health care professionals assume that children are "naturally active" when young, the research indicates the opposite. At 4-years of age, children already engage in alarmingly high rates of sedentary behaviour (more than 7 hours/day) and very low levels of vigorous physical activity (average 7 min/day) (13).

Table 2. Template assessment for physical activity in childhood obesity.

Physical Activity Overview		
Does parent know that 60 mins of PA is needed for the child's health everyday (6-18 yrs) / 180 mins per day (<6 years)?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is child getting recommended 60 mins of PA (that makes them breathe hard) everyday (6-18 yrs) / 180 mins per day for <6 years?*	Yes <input type="checkbox"/>	No <input type="checkbox"/>
*Use age-specific standardised questionnaires where possible. How does child get to school?	Car <input type="checkbox"/> Bus <input type="checkbox"/> Walks <input type="checkbox"/> Cycles <input type="checkbox"/> Other:	
Is active transport to school possible?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Is child active at break times in school? For how many mins?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Does child engage in physical activity after school?	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Hours per week in planned activity (details: type frequency, duration of activity/sport and time spent in play)		
Does child have:	A safe place to play? Games / equipment?	Yes <input type="checkbox"/> No <input type="checkbox"/> Bicycle Y <input type="checkbox"/> N <input type="checkbox"/> Scooter Y <input type="checkbox"/> N <input type="checkbox"/> Trampoline Y <input type="checkbox"/> N <input type="checkbox"/> Garden Y <input type="checkbox"/> N <input type="checkbox"/> Exergame Y <input type="checkbox"/> N <input type="checkbox"/> Balls Y <input type="checkbox"/> N <input type="checkbox"/>
Barriers to physical activity (detail)	Pain <input type="checkbox"/> Safety concerns <input type="checkbox"/> Falls <input type="checkbox"/> No Time <input type="checkbox"/> Inclement Weather <input type="checkbox"/> No friends <input type="checkbox"/> Self-conscious <input type="checkbox"/> Enuresis <input type="checkbox"/> Breathlessness <input type="checkbox"/> Other: <input type="checkbox"/>	

Recommendations for childhood physical activity in children 5-18 years are a minimum of 60 minutes per day of moderate to vigorous physical activity (24) and children under 6 years should engage in physical activity (play and exercise) for at least 3 hours daily (WHO guidelines). Similarly sedentary guidelines suggest a maximum screen time of 2 hours per day in children over 5 years, not more than 1 hour of supervised screen-time in those 2-5 years. In those under 2 years, it is recommended that screens are only used for supervised communication (video-conferencing) with parents. Although these recommendations are encouraged by scientific societies and public health bodies, data clearly show that few children and adolescents meet them and that a large proportion of the population are not aware or do not understand these recommendations (30). It is definitely a challenge to effectively promote structured physical activity in children and adolescents with obesity as highlighted by the high dropout rates reported in the literature. Similarly, activity promotion is even more difficult for children who are largely sedentary and who may have low perceived confidence and competence in movement. Adapted and structured physical activity interventions designed to treat pediatric obesity must be implemented in addition to advising on activity recommendations in a counseling-style session (21). Similarly, children should be encouraged and supported to stay active (achieving activity recommendations) outside and upon completion of their weight-management exercise intervention. This is the only way to avoid any potential compensatory responses in energy balance regulation (for more details about

these energetic and nutritional compensatory responses see Thivel et al., (28) and Thivel et al. (29). Where activity recommendations are given as passive information by practitioners to keep children healthy, adapted physical activity interventions are designed and delivered actively and through physical practice in order to promote motor confidence for the ongoing successful treatment of childhood overweight and obesity. It should be noted that parents and other family members demonstrate less concern about children’s lack of physical activity and screen-time habits than about their food habits (3) (6). Research suggests that family’s attitudes toward children’s screen-time are influenced by parents’ own television viewing practices (26), as well as by the perceived utility of television viewing in „babysitting“ or calming children (3), particularly when parents are engaged in household chores (9), or when their sleep schedules do not align with their children’s (4).

Table 3. Template assessment for sedentary time in childhood obesity.

Sedentary Time Overview		
<i>Does child spend most of their free time sitting/doing inactive hobbies ?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>Does the child have a smartphone or tablet?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>Does the child have a TV in the bedroom?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>Are screens left on when the child is sleeping (e.g. phone /tablet /TV)?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>On an average schoolday how many hours does the child spend doing the following:</i>	Homework/ study	_____
	Watching TV	_____
	Talking on phone	_____
	Texting	_____
	Using a PC/laptop/tablet	_____
	Video/online games	_____
	Watching movies (in theatres or online)	_____
	Reading for leisure	_____
	Listening to music	_____
	Other :	_____
<i>On an average weekend day how many hours does the child spend doing the following:</i>	Homework/ study	_____
	Watching TV	_____
	Talking on phone	_____
	Texting	_____
	Using a PC/laptop/tablet	_____
	Video/online games	_____
	Watching movies (in theatres or online)	_____
	Reading for leisure	_____
	Listening to music	_____
	Other :	_____
<i>Are there house rules around use of screens?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>Are screens on when the child is eating?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>When watching TV do you skip/mute the advertisements?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<i>Is child’s use of the Internet supervised?</i>	Yes <input type="checkbox"/>	No <input type="checkbox"/>

INTRODUCING REGULAR ASSESSMENT OF PHYSICAL FITNESS

Themed discussions with ECOG participants revealed the necessity to clarify the differences and similarities between physical activity and physical fitness. Obviously activity and fitness are highly dependent and inter-related, however they are two distinct constructs that should also be considered in isolation. It was understood by participants that fitness relies on the level of physical ability (e.g. being able to participate in a mainstream PE class would rely on being able to walk or run) however it was more difficult for attendees to identify the principal components of overall fitness. Similarly, clearly identifying the importance of evaluating such components and their physical indicators was a challenge for the group. Although it appeared obvious to our practitioners to evaluate physical activity or at least to introduce its beneficial effects to children and their parents, the important role of fitness as a facilitator of or a barrier to activity and long-term health remained confusing.

Physical fitness represents the ability of an individual to perform daily activities with no excessive pain or energy expenditure (1). It was interesting to observe that our audience was surprised that the definition of fitness rests on activities of daily-living and not specifically structured and controlled exercise, play or sport activities. Participants considered fitness as a concept related to sports and fitness training rather than to the everyday functional needs of a healthy child like playing active skipping games with friends, being able to run or to kick a ball or being able to self-propel a wheelchair to school. Similarly, the group was challenged when encouraged to identify appropriate indicators and methods of assessing physical fitness. Since it is not the purpose of this paper to detail all the available recommended methods of assessing fitness, from laboratory-based tests to field tests, we do recommend the reader to become acquainted with supplementary reading in the area (22, 29). Briefly, cardiorespiratory fitness, muscle function, agility, balance, and flexibility are the main health-related and skill-related components of fitness which should be screened in youth with obesity. Assessment and subsequent treatment for these is indicated due to the ample evidence which describes the multitude of obesity-related physical comorbidities. Such comorbidities include: impaired cardiorespiratory health; impaired muscle strength; impaired motor competence and balance; orthopedic impairments and impaired gait and posture (27) (11) (12).

As part of a staged-treatment approach every practitioner assessing a child for obesity should introduce the theme of physical activity and fitness at initial assessment.

Simple age-appropriate questions can be posed to the child, adolescent and their parents to briefly identify any potential physical difficulties in their daily living (i.e. "can you sit down on the floor and get up again on your own and can you do this without feeling any pain?"). A simple functional test such as this can be very helpful in identifying physical strengths and difficulties. Beside that basic trait, assessing the child's capacity to perform physical tasks provides both qualitative (motor development) and quantitative (level of performance) information, identifying not only whether the child can perform the task properly but also how he/she can complete it. Pediatric movement specialists such as physiotherapists, exercise physiologists, sports physicians, occupational therapists and adapted-PA teachers are

trained to identify and address the barriers to efficient movement which can often impede the effectiveness of attempts to increase energy expenditure through active play and movement (2).

DISCUSSION

Following the 2016 ECOG workshop it was concluded that there is variation in the understanding of practitioners regarding the definition, measurement and prescription of physical activity for the promotion of fitness and management of co-morbidity in pediatric obesity. It was agreed that simple tools are needed by practitioners across Europe in order to develop a standardized approach to assessing and promoting physical activity and fitness in children attending for obesity treatment. Table 1 provides a framework for the practitioner to self-reflect on his/her understanding of activity and fitness in obesity and Table 2 and 3 provide an assessment template for inclusion in clinic assessment forms. For a detailed discussion of physical activity and fitness in childhood obesity (including standardized measurement of these domains) the reader is directed to the ECOG eBook at <http://ebook.ecog-obesity.eu>.

Note. *Physical activity assessment, promotion and performance in relation to child and adolescent obesity is a field new to medicine and should be taught to undergraduates and practitioners. The complexity of the field and the overlap with several fields such as physiotherapy, psychology, sleep medicine and cardiology, require development of appropriate practical tools. The ECOG has published free online tools (www.ecog-obesity.eu) that are intended as a basis for the next steps: establishing practical courses and detailed recommendations.*

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