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PHYSICAL EXERCISE AS MEDICINE IN CHRONIC DISEASES DURING CHILDHOOD AND ADOLESCENCE

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ABSTRACT:
Background: Engaging in physical activity (PA) and physical exercise (PE) enhances overall quality of life, reduces the risk of developing diseases in healthy children and adolescents, and can be used as a treatment for chronic disorders commonly found in childhood.
Objectives: This article examines the current scientific evidence and provides updated advice for professionals in children's health. It emphasizes the importance of understanding how to prescribe physical exercise and physical activity for various pediatric conditions.
Methods: A review of the current literature and scientific evidence regarding the effects of PA and PE on children's health was conducted. Recommendations from the Association of Pediatrics, via the Health Promotion Committee, were also considered.
Results: PA and PE, when used as medications, can help mitigate the adverse effects of a sedentary lifestyle and inactivity, which contribute to the development of various diseases. A substantial increase in physical activity levels should accompany efforts to reduce inactivity in children and adolescents. Integrated training programs that enhance overall neuromuscular fitness and improve physical, cognitive, and psychosocial performance are essential.
Conclusions: The Health Promotion Committee of the Association of Pediatrics suggests implementing ways to enhance the health of patients by promoting physical education (PE) and increasing physical activity (PA). Efforts to reduce inactivity and promote PA and PE are crucial in improving the overall health and well-being of children and adolescents.

KEYWORD: Physical Activity; Physical Exercise; Exercise as a Treatment; Health; Pediatrics.

INTRODUCTION:

Engaging in physical activity (PA) and physical exercise (PE) enhances the overall quality of life and is a preventive measure against developing diseases in healthy children and adolescents. Additionally, it is crucial in treating chronic diseases commonly found in childhood (table 1). This article examines the current scientific evidence and provides updated advice for experts in children's health. These suggestions can be used in the comprehensive treatment of illnesses, even those for whom rest was previously advised. The World Health Organization (WHO) and the American College of Sports Medicine (ACSM), in collaboration with the Association of Pediatrics (AEP) through initiatives like "Exercise is medicine," provide suggestions for enhancing health through physical activity (Souilla, Larsen, Juhl, Skou, & Bricca, 2024; Stöcker, Gaser, Oberhoffer-Fritz, & Sitzberger, 2024).

Integrating physical activity (PA) into your daily schedule enhances your child's physical fitness and bone and cardiovascular well-being, reduces the chances of obesity, boosts academic achievement, and improves mood. AP is an essential tool for preventing diseases in childhood, youth, and later age. The World Health Organization (WHO) recognizes a sedentary lifestyle as a significant health concern among children and young individuals aged 5 to 17. This issue is on par with other risk factors like hypertension, smoking, or obesity. Among adults, a lack of physical activity is a significant and avoidable factor contributing to mortality. The ANIBES study "Sedentary lifestyle in children and adolescents", released in 2016, found that 48.4% of participants aged 9 to 17 spent over 2 hours per day in front of a screen, and 84.0% did so on weekends. It is crucial to establish and reinforce habits that promote good health during childhood and adolescence. Therefore, it is imperative to develop techniques that encourage physical activity from a young age (Bernard et al., 2024; Fyffe, Orr, Cassimatis, & Browne, 2024; Xavier et al., 2024).

GENERAL RECOMMENDATIONS ON PHYSICAL ACTIVITY IN CHILDREN AND ADOLESCENTS:

When making recommendations for physical activity, it is essential to consider the individual's physical condition, age, and gender, as well as their socio-cultural influences and personal preferences. The AEP Physical Activity Committee has formulated practical and specific recommendations. Parents and staff responsible for children's education must work together with institutional efforts to promote physical education (PE) and physical activity (PA) to create a tangible improvement in community health. This collaboration should involve a practical and specific approach, as outlined in Table 2. The suggestions provided are derived from the guidelines published by the World Health Organization (WHO) in 2010, which have been approved by the recently published Physical Activity Guidelines by the US Department of Health (Biondi, 2024; Lindsay & Hsu, 2024).

Table 1: Health Benefits of Physical Exercise

Category	Benefits	References
Adiposity, Bone Health, and Body Composition	- Increased daily energy use - Enhances physical condition by strengthening resistance, increasing speed, improving reflexes, and agility - Controls hunger and hormone synthesis - Builds muscle mass - Hypertrophy and increased oxygen uptake - Reduced adipose tissue and obesity risk - Treats and prevents obesity - Decreased risk of obesity-related comorbidities - Reduced risk of osteoporosis due to increased bone mass and mineral density	Souilla, Larsen, Juhl, Skou, & Bricca, 2024 Stöcker, Gaser, Oberhoffer-Fritz, & Sitzberger, 2024
Risk Factors for Cardiovascular Disease	- Metabolic and cardiorespiratory advantages - Enhances atherogenic lipid profile by lowering triglycerides and raising HDL cholesterol - Decreases insulin resistance, reducing the need for insulin in people with diabetes and preventing diabetes	Bernard et al., 2024 Fyffe, Orr, Cassimatis, & Browne, 2024
Mental Well-Being and Outlook on Life	- Shields against the harmful effects of a sedentary lifestyle - Enhances mood and self-worth (reduces anxiety and depression) - Improves social integration - Enhances underlying disease management - Enhances academic achievement - May help prevent smoking initiation in children and adolescents	Xavier et al., 2024 de Andrade Alvarenga et al., 2024
Enhances Health in Specific Conditions	- Impairment of motor function - Syndromes of hypotonicity - Cardiorespiratory illnesses - Depression - Cancer - Other chronic diseases	Taheri & Proctor, 2024 Módolo et al., 2024

Table 2: Summary of the Physical Activity Committee of the Pediatrics Association Recommendations

Recommendation	Details	References
Daily Physical Activity	Engage in moderate or intense physical activity for at least 60 minutes daily, which can be split into several sessions. This should primarily consist of aerobic exercises and rigorous activities that strengthen muscles and bones, done three times a week.	WHO, 2010 US Department of Health, 2024 Biondi, 2024
Avoiding Sedentary Lifestyle	Refrain from leading a sedentary lifestyle. Engage in daily physical exercise, such as walking, cycling, and climbing stairs. Limit screen time.	Lindsay & Hsu, 2024
Group Outdoor Activities	Engage in group outdoor activities that provide positive reinforcement and can be incorporated as a "fun, daily, healthy habit." Extracurricular activities are highly beneficial.	Bernard et al., 2024
Safe Physical Environment	Ensure the physical setting is sufficient and devoid of hazards, adhering to essential safety protocols for engaging in any sport.	Souilla et al., 2024
Physical Activity for All Health Conditions	Regular physical activity has numerous advantages tailored to particular circumstances or conditions, enhancing general well-being.	WHO, 2010 US Department of Health, 2024
Home-based Physical Activities and Sports	Enhance a child's habits through physical activities and sports within the home setting. Parents should demonstrate leadership by organizing family events in which they actively engage.	Xavier et al., 2024
Adequate Nutrition and Hydration	Ensure sufficient nourishment and hydration to augment and harmonize the advantages of physical exercise.	de Andrade Alvarenga et al., 2024
Moderate Intensity Activities	Aerobic physical activity is characterized by increased body temperature and mild perspiration. Heart rate and breathing rate are elevated, but one can still converse comfortably. Examples: brisk walking, and cycling at moderate speed.	Módolo et al., 2024
Vigorous Intensity Activities	During vigorous aerobic activities, individuals experience significant heat and sweating, increased heart rate, and more difficult breathing, making conversation challenging. Examples: jogging, and rapid cycling.	Zhang et al., 2024

Table 3: Specific Recommendations for Physical Activity in Children and Adolescents

Age Group	Recommendation Details	References
Infants (0-1 year)	Engage in physical activity multiple times a day, including floor-based play. Avoid being restrained in strollers or highchairs for more than one hour at a time.	WHO, 2019 Módolo et al., 2024
Toddlers (1-3 years)	At least 180 minutes of physical activity spread throughout the day, including activities of light, moderate, and vigorous intensity.	WHO, 2019 Zhang et al., 2024
Preschoolers (3-5 years)	At least 180 minutes of physical activity per day, with at least 60 minutes of moderate-to-vigorous intensity activities.	WHO, 2019 Lindsay & Hsu, 2024
Children and Adolescents (5-17 years)	Engage in at least 60 minutes of moderate-to-vigorous intensity physical activity daily, including activities that strengthen muscles and bones at least 3 times per week.	WHO, 2010 US Department of Health, 2024 Biondi, 2024

Table 4: Barriers to Physical Activity in Children and Adolescents

Barrier	Description	References
Sedentary Lifestyle	The high prevalence of screen time, including television, video games, and mobile devices, contributes to reduced physical activity.	ANIBES Study, 2016 Bernard et al., 2024
Lack of Safe Spaces	Insufficient access to safe parks, playgrounds, and recreational facilities for physical activity.	Souilla et al., 2024 Xavier et al., 2024
Socioeconomic Factors	Limited financial resources to participate in organized sports or access necessary equipment.	Fyffe et al., 2024
Cultural and Social Influences	Cultural norms and peer influences do not prioritize physical activity.	Taheri & Proctor, 2024
Parental Support	Lack of parental involvement and encouragement in children's physical activities.	de Andrade Alvarenga et al., 2024

Table 5: Strategies to Promote Physical Activity in Children and Adolescents

Strategy	Description	References
School Programs	Implement comprehensive school-based programs that include physical education classes and extracurricular sports.	WHO, 2010 US Department of Health, 2024 Biondi, 2024
Community Initiatives	Develop community-based programs and facilities to promote physical activity among children and adolescents.	Lindsay & Hsu, 2024
Parental Involvement	Encourage parents to model active behaviours and engage in physical activities with their children.	Xavier et al., 2024
Policy and Environmental Changes	Advocate for policies that create safe and accessible environments for physical activity, such as bike lanes and parks.	Souilla et al., 2024
Education and Awareness Campaigns	Raise awareness about the benefits of physical activity and provide education on how to incorporate it into daily routines.	Stöcker et al., 2024

Table 6: Potential Health Risks of Inactivity in Children and Adolescents

Health Risk	Description	References
Obesity	Increased risk of becoming overweight or obese due to lack of physical activity and poor dietary habits.	Bernard et al., 2024
Cardiovascular Diseases	Higher risk of developing cardiovascular diseases such as hypertension and atherosclerosis.	Fyffe et al., 2024
Type 2 Diabetes	Increased risk of developing insulin resistance and type 2 diabetes.	Taheri & Proctor, 2024
Mental Health Issues	Greater likelihood of experiencing anxiety, depression, and low self-esteem.	Xavier et al., 2024
Poor Bone Health	Lower bone mineral density and increased risk of osteoporosis later in life.	de Andrade Alvarenga et al., 2024

Table 7: Benefits of Physical Activity on Mental Health in Children and Adolescents

Benefit	Description	References
Improved Mood	Physical activity can reduce symptoms of anxiety and depression, leading to improved mood.	Módolo et al., 2024
Enhanced Self-Esteem	Regular physical activity helps boost self-esteem and confidence in children and adolescents.	Zhang et al., 2024
Better Social Integration	Participating in team sports and group activities fosters social skills and integration.	Bernard et al., 2024
Reduced Stress Levels	Engaging in physical activity helps manage stress and promotes relaxation.	Fyffe et al., 2024
Improved Academic Performance	Regular physical activity is associated with better concentration, memory, and academic performance.	Lindsay & Hsu, 2024

In the latter scenario, the significance of engaging in physical activity at a moderate to robust level is further emphasized to get health advantages. Nevertheless, despite endeavours to encourage physical activity, the PASOS survey in Spain 2019 reveals that 63.6% of children and adolescents still need to meet the recommended threshold of 60 minutes of moderate to strenuous physical exercise daily. The proportion of girls who do not adhere to the recommendations set by the World Health Organization (70.4%) is greater than the proportion of males (56.3%) (de Andrade Alvarenga et al., 2024; Taheri & Proctor, 2024).

Adiposity, Bone Health, And Body Composition:
- Increased daily energy use
- Enhances physical condition by strengthening resistance, increasing speed, improving reflexes, and improving agility.
- Controls hunger and the synthesis of hormones.
- Builds up muscle mass.
- Hypertrophy and increased oxygen uptake
- Reduced adipose tissue and obesity risk can help treat and prevent obesity.
- Reduces the chance of obesity-related comorbidities.
- Decreased risk of osteoporosis due to increased bone mass and mineral density

Risk Factors for Cardiovascular Disease:
- Metabolic and cardiorespiratory advantages
- It enhances the atherogenic lipid profile by lowering triglycerides and raising HDL cholesterol.
- It decreases insulin resistance, which lowers the need for insulin in people with diabetes and helps them avoid diabetes.

Mental Well-Being and Outlook on Life:
- Shields against the harmful consequences of a sedentary lifestyle
- Enhances mood and self-worth (reduces anxiety and despair)
- Enhances societal integration. (Teaches you to embrace and cherish teamwork, integrate and assume responsibility, and lessens the propensity to adopt confrontational attitudes.)
- Enhances underlying disease management Enhances academic achievement
- It may aid in keeping kids and teenagers from beginning to smoke.

In The Following Situations, It Enhances Health and Advances Therapeutic Development:
- Impairment of motor function
- Syndromes of hypotonicity
- Illnesses that affect the cardiorespiratory system inhalation
- Depression
- Cancer
- Others

Table 1 Health Benefits of Physical Exercise

1) It engages in moderate or intense physical activity for at least 60 minutes daily, which can be split into many sessions. This should primarily consist of aerobic exercises and rigorous activities that strengthen muscles and bones, done three times a week. Prolonged aerobic exercise lasting over 60 minutes yields further health advantages.
2) Refrain from leading a sedentary lifestyle. Engaging in daily physical exercise is preferable to leading a sedentary lifestyle. This includes walking from home to work, cycling, and climbing stairs. It is advisable to restrict the amount of time that your kid or teenager spends looking at the television or other electronic gadgets as much as possible.
3) Engaging in group outdoor activities that provide positive reinforcement is preferable, as they can be incorporated as a "fun, daily, healthy habit." Engaging in extracurricular activities is highly beneficial for this objective.
4) The physical setting where an activity occurs must be sufficient and devoid of hazards, adhering to the essential safety protocols for engaging in any sport.
5) PA is indicated for all health conditions. Regular physical activity has numerous advantages, tailored to particular circumstances or conditions, enhancing general well-being.
6) Physical activities and sports within the home setting enhance a child's habits. Parents should demonstrate leadership by organizing family events in which they actively engage.
7) Sufficient nourishment and hydration Augment and harmonize the advantages of EF.
a. At A Moderate Level of Intensity:
Aerobic physical activity (PA) is characterized by increased body temperature and the onset of mild perspiration. Additionally, both heart rate and breathing rate are elevated; however, one may still converse comfortably without experiencing breathlessness. For instance, one may engage in brisk walking (at a speed exceeding 6 km/h) or cycling (at a speed ranging from 16 to 19 km/h).
There is no text provided.
b. At A Vigorous Level of Intensity:
During aerobic BAF, individuals experience a heightened sensation of heat and sweating. During practice, the heart rate increases, and breathing becomes more difficult, making it challenging to talk, such as while jogging or cycling rapidly at 19-22 km/h.

Table 2 Summary of the Physical Activity Committee of the Paediatrics Association recommendations aimed at the population aged between 5 and 17 years.

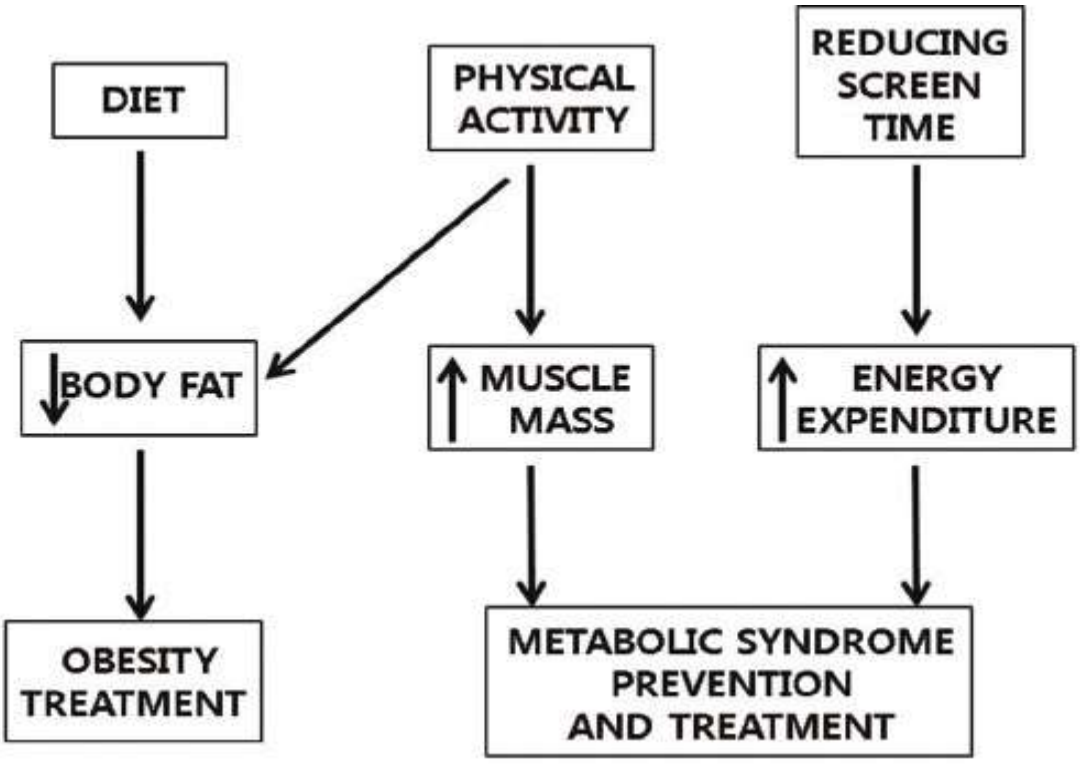

Figure 1 Mechanisms of PA in obesity prevention and treatment.

The latest 2019 WHO recommendations on physical activity (PA) for children aged 0 to 5 emphasize the significance of promoting PA early. These guidelines suggest that newborns should engage in physical activity multiple times a day by playing on the floor and interacting with others. It is advised that they should not be seated or restrained in strollers, high chairs, or backpacks for more than an hour at a time. Individuals who cannot walk should allocate a minimum of thirty minutes daily to lie in a prone position while conscious. Starting at the age of one, children are advised to engage in at least 180 minutes of physical activity every day. By age three, this should include at least one hour of physical activity of "moderate to vigorous" intensity, such as games that require running or jumping (Módolo et al., 2024; Zhang et al., 2024).

OBESITY AND CARDIOVASCULAR RISK:

The incidence of juvenile overweight as well as obesity in our nation appears to be reaching a plateau, yet 18.1% of children (20.4% among boys and 15.8% among girls) continue to experience obesity. Excessive body fat in children and teenagers increases the likelihood of developing further health problems, including high blood pressure, abnormal cholesterol levels, reduced ability to process insulin and glucose, non-alcoholic fatty liver disease, high levels of uric acid, decreased physical fitness, and an increased risk of sleep apnea. All these cardiovascular risk factors are associated with developing cardiovascular disease in adults. A significant aspect contributing to this predicament is the considerable decline in physical activity levels among children and teenagers. If lack of physical activity is the underlying factor behind an illness, engaging in physical activity (PA) serves as the remedy for two distinct reasons (Bachmann et al., 2024; Kubek, Claus, Zernikow, & Wager, 2024).

On one side, it enhances energy expenditure, enabling the reduction of fat deposits. Conversely, PA enhances the metabolic profile by improving short- and long-term insulin sensitivity. Additionally, it promotes an increase in muscle mass, which benefits cardiovascular health and physical fitness (fig. 1). This positive impact has been proven by multiple cross-sectional, cohort, and experimental research. Table 3 provides a concise summary of the clinical signs. When dealing with obesity in children and adolescents, the suggestions adhere to general criteria, considering the limits that may arise from their compromised physical state. The metabolic risk can be substantially decreased, particularly by gradually enhancing the activity level to 7.8 in sedentary youngsters. During the initial phase, engaging in high-impact motor activities like running is not recommended. Instead, brisk walking is considered one of the most appropriate forms of physical exercise for kids and teenagers with obesity (Itriyeva, 2024; Watson et al., 2024).

HEALTH ISSUE	SAMPLE STUDIED	EFFECT	PA VOLUME REQUIRED TO OBTAIN THE HEALTH BENEFIT
Obesity	Overweight, obesity	1	F: 3-5 days/week I: moderate to vigorous D: 30-40 minutes/day T: different aerobic activities
Cardiovascular Health			
Metabolic syndrome	Overweight, obese	1	Not clear
Lipids			
Overall cholesterol		0	Not clear
HDL-cholesterol		1	Not clear (like obesity)
LDL-cholesterol		0	Not clear
Triglycerides		1	Not clear (like obesity)
Blood Pressure	Hypertensive	1	F: 12-32 weeks, 3 days/week I: intensity sufficient to improve physical condition D: 30 min/session T: aerobic exercise
	Normotensives	0	Not clear
0 is indefinite effect; 1 is positive effect; T is type; F is frequency; D is duration; I is intensity.			

Table 3 Association between practising PA and cardiovascular risk factors

BONE HEALTH:

Osteoporosis, a prevalent condition among older individuals, originates in childhood. During the process of growing, bone mass is gradually accumulated by a combination of proper nutrition and mechanical stresses. During puberty, there is a significant rise in bone mineral content (BMC) and height development. This increase in BMC reaches its most critical point right after the peak of height growth. Over 4 years, which includes the most significant bone gain period, around 39% of the total amount of bone mass is acquired. In the subsequent 4 years, until around the age of 20, roughly 95% of the total bone mass that would be present in maturity is reached (Farrow et al., 2024; Salam et al., 2024).

An individual's bone mass percentile typically remains stable throughout their lifetime. Low levels of bone mineral content (BMC) and bone mineral density (BMD) throughout adolescence contribute to the development of early osteopenia and osteoporosis in adulthood and an increased risk of future fractures. Hypovitaminosis D is caused by a decrease in the use of milk and dairy products and an increase in the ingestion of sugary drinks. This dietary shift results in a low intake of calcium as well as a high intake of phosphorus (Minotti et al., 2024).

The child population is considered a risk category for several reasons, including the widespread occurrence of overweight and obesity, the excessive use or misuse of sunscreens, and the decline in physical activity. After identification, appropriate measures should be taken to enhance bone mass levels. This can be achieved by modifying the nutritional and metabolic environment and recommending osteogenic physical sports activities involving jumping and running, which benefit bone health (Codazzi, Frontino, Galimberti, Giustina, & Petrelli, 2024).

PSYCHOAFFECTIVE ASPECTS AND ACADEMIC PERFORMANCE:

Engaging in sports can yield significant physical, psychological, and social advantages for individuals, essential to a person's whole education. Sport has long been thought of as a means of character development. Sports practice has excellent educational and training value since it fosters the development of traits like loyalty, collaboration, strength, focus, tenacity, discipline, opposition, dedication, or perseverance. Sports should be viewed as a form of education, social interaction, health promotion, stress reduction, exploration of new experiences and adventures, and amusement rather than as a show in the never-ending quest for greatness and victory (Dang et al., 2024; Mohamed, Abd-Elmageed, & Ramadan, 2024).

Participating in sports enhances a person's quality of life, academic achievement, and sense of self-worth. Severe exercise also raises neurotransmitter concentrations that influence cognitive functions, including memory storage. Intelligence and educational attainment are favourably correlated with physical fitness level; studies have found a relationship between physiological fitness level and success in subjects like reading and math. Consequently, enough data supports the idea that physical activity espe, especially aerobic-cardiovascular exercise, improves kids' cognitive achievement (Aratti & Zampini, 2024; Duan et al., 2024).

BRONCHIAL ASTHMA:

PA is associated with improved cardiorespiratory health in children and adolescents by enhancing physical condition. The most prevalent chronic respiratory illness is asthma, which affects 10% of the Spanish population and has been on the rise recently. It has been demonstrated that PA practice lessens the frequency and intensity of asthma attacks. Therefore, physical activity and additionally competitive sports can assist in enhancing asthma management since the goal of treatment for asthma is to ensure that the kid or teenager with the condition has an everyday life. In this instance, sequential sports like badminton, tennis, judo, or swimming are far less likely to cause a crisis than sports with longer durations like athletics, basketball, football, etc (Doenhardt et al., 2024; Rask, Duholm, Poulsen, Rimvall, & Wright, 2024).

To make their practice feasible, the kid or teenager must select the sport or physical activity they enjoy, and the physician must modify the course of therapy accordingly. Recommendations need to be tailored to any circumstance. Adopting sports hygiene practices, such as refraining from playing

sports during an asthma attack that has already occurred, playing sports in hot, muggy conditions, warming up, and gradual training, is vital to prevent attacks. The young person needs to learn how to breathe by utilizing their mouth and nose appropriately, and their nasal passages must be clear. Medication must be started when a youngster or adolescent exhibits symptoms frequently, either daily or before engaging in sports. When practising PA, if a crisis arises, the exercise must end (Flasch, 2024; Robinson et al., 2024). This is frequently the only way the individual in need quits and can resume the activity later. You should adhere to your pediatrician's directions regarding the flare-up scenario if this doesn't happen. The young person needs to be watched over and accompanied. Adopting these recommendations and PA considerably exceed the potential dangers, even in cases of exercise-induced asthma. Furthermore, these dangers are significantly reduced by gradually extending AP's time frame and intensity. Parents of children and teenagers with asthma should be able to recognize them, let instructors and coaches know about any medication they might require, and bring the medicines alongside them in case they're needed (Chan, Lai, Ma, & Chan, 2024; Rustamova & Ismailova, 2024).

CANCER:

Due to the relatively high rate of survival for pediatric cancers, efforts have been focused on reducing the side effects of radiation and chemotherapy for the children who survive, as well as on preventing the spread of malignancies altogether. Over 75% of kids and teenagers with cancer will fully recover from their illness. However, almost 60% of them will be doomed to live with long-term health issues for decades after receiving therapy. Treatments for childhood cancer have been associated with a wide range of negative consequences and relapses. Improving the quality of life is necessary because of the disease's evolutionary path and high survival rate (Black et al., 2024; da Costa et al., 2024).

The treatment's side effects include the low blood pressure that pediatric patients frequently encounter and the reduction in their muscle strength and cardiorespiratory capacity when contrasted with healthy patients. Checks: it is understandable that children with cancer experience fatigue quickly, which lowers their quality of life and their capacity to manage everyday activities. Additionally, this problem is made worse by the overly protective mindset that these children's parents and guardians typically adopt. Because EF positively affects the immunological system, the system of muscles and tendons, the cardiovascular system, the central nervous system, and the inflammatory and oxidative systems, it can lessen the adverse effects associated with the treatment (Gkintoni, Vantaraki, Skoulidi, Anastassopoulos, & Vantarakis, 2024; Kieling et al., 2024).

Regular physical education enhances an individual's capacity to perform daily chores with increased efficiency and comfort. In the past, medical professionals advised cancer patients to limit their physical activity both during and after treatment. This advice was especially detrimental to children, as physical activity is necessary for healthy development and offers additional psychological and social advantages. Recent research has demonstrated that exercise intervention programs are safe for children with cancer, both during and after therapy, and that they positively impact muscular strength and cardiorespiratory fitness. However, most exercise regimens are designed for kids with hematological malignancies. At the same time, solid tumours, whose therapies are more severe and have a higher impact on the child's organ systems, have less evidence (Barretto, Gouveia, & Alves, 2024; Zhou et al., 2024).

Regular, moderate exercise can enhance immune function (NK cell function, dendritic cell count, anti-inflammatory substances). However, this kind of non-pharmacological intervention has no side effects. It raises two crucial markers of overall health status in children with malignancy: muscular strength and cardiorespiratory fitness. Children with cancer can have a better quality of life and less suffering from the devasting effects of treatment, particularly chemotherapy if they exercise. Frequent exercise, such as walking quickly for a minimum of thirty minutes on nearly every day of the week, produces benefits contrary to cancer treatment (Danielson et al., 2024; Greco, 2024).

The combined efforts of endurance and strengthening exercises and individualized, hospital-based physical exercise have yielded the most significant effects in intervention studies, including

children with cancer. Moreover, the gains made persisted, at least in part, for several months following the intervention's conclusion. However, it has been demonstrated that unsupervised exercise and exercise outside the hospital typically at the patient's home are less beneficial (Hu et al., 2024).

PHYSICAL OR MENTAL DISABILITY:

For those with either mental or physical challenges, PA and PE are essential to their overall development. In populations with features, including those with impairments, the beneficial effects of PAs are even more significant. PE is a practice that most people with disabilities may profit from, and it can be tailored to each person's unique situation. Lack of movement and hypokinesia are common symptoms of disability. People with disabilities who are too cautious, fearful, or ignorant become sedentary. A disability does not warrant this decline in functional capacity caused by this absence of muscle activation. In the end, the functional decline brought on by immobility exacerbates the clinical picture by compounding the impairment with obesity, hypertension, or diabetes (Bhoopathi & Tripicchio, 2024; Fornefeld, Fricke, Schulte, & Schmidt, 2024).

To interrupt this vicious cycle, we must offer this population group appropriate, inclusive options for physical education. These disabled individuals have inferior physical and body composition than other people because they have less muscle, less bone mass and density, more body fat, and lower levels of aerobic capacity and muscle strength. These findings are significant since there is a connection between these physical condition factors and the capacity to carry out autonomous work and daily activities. These relationships could also result in severe issues like osteoporosis, sarcopenia, or cardiovascular events. It is necessary to suggest an activity or sport that best fits the needs of each impaired youngster (Chandra et al., 2024).

This is essential to living a self-sufficient, fulfilling, and complete existence in social interactions. Beyond swimming, water sports are the most engaging options for individuals with disabilities because they offer a variety of advantages (such as the absence of gravity and temperature changes) and can be easily customized to meet the unique needs of each participant based on their disability. It has been demonstrated that PE and PA, in general, improve muscle mass and health and positively impact various health variables in individuals with impairments, such as balance, strength in the muscles, aerobic capacity, and body weight. The success of this kind of intervention depends on how well PE is tailored to the goals and features of the individual with a disability. It also needs to be inclusive and occur in a setting like his personal and social environment (Krieger, Piškur, Beurskens, & Moser, 2024).

TRIAD OF PEDIATRIC INACTIVITY:

A novel idea called the pediatric inactivity triad (PIT) was put out to assess inactivity in terms of its three constituents: physical illiteracy, pediatric daphnia, and PA deficit. While each of the three elements is distinct and significant, they are also interconnected and need to be considered together, particularly when addressing inactivity in any of the conditions this page lists. A person with moderate-to-severe blood pressure that is not within recommended ranges is regarded as a health risk. It should be managed similarly to other risk factors like smoking or hypertension. This is the initial element of the TIP. The exercise deficit is modified by two additional factors, which are identified by the second or third elements of the TIP (Kang et al., 2024).

Low levels of muscle power and strength unrelated to neuromuscular disease and associated functional restrictions are the hallmarks of pediatric daphnia. Dynapenia increases a child or adolescent's risk of inactivity, functional impairments, and exercise-related injuries. To enable these at-risk individuals to attain PA levels comparable to their more capable peers, it is imperative to identify them, develop targeted therapies to improve their muscle health and establish physical activity habits that enhance their strength. Physical illiteracy, or the third TIP component, is characterized by a lack of self-assurance, skill, drive, and knowledge (Delahunt, Oligbo, Hart, & Thompson, 2024).

This is a collection of detrimental elements about psychomotor, cognitive, and affective components of learning stages that result in PA deficiencies and pediatric daphnia. To help inactive youth understand the need for physical activity, interventions aimed at enhancing the third TIP component must be accompanied by education incorporating social and motivational tactics. Treatment plans focusing on only one TIP component are less likely to produce the intended effects. Throughout integrating and training programs that jointly improve physical, cognitive, and psychosocial performance as well as neuromuscular physical condition, the intervention's goal should be to raise the level of PA (Sun et al., 2024).

FINAL CONSIDERATIONS:

All this data suggests that physical inactivity and a sedentary lifestyle are the root causes of disease, and PE is a medicine. As a result, people in charge of providing pediatric care must be aware of how PE is prescribed and actively advocate for its use both within and outside consultations. Using the Health Promotion Committee, the AEP provides its members with resources to aid in the attainment of this audacious goal: enhancing patient health via this "treatment" that is so compassionate and characteristic of childhood along with adolescence: the practice of PE or the rise in PA in our community.

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