

Opinion

Time to Focus on Movement and Active Play Across the First 2000 Days of Life

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Abstract: Chronic health conditions including obesity, cardiovascular diseases, type 2 diabetes, and depression are rising in Australia, and are often addressed reactively in adulthood rather than proactively during childhood. Evidence highlights the first 2000 days (from conception to five years of age) as a critical window for prevention, where movement, active play, proper nutrition, and adequate sleep are key to reducing chronic disease risk. Despite this, limited longitudinal data on children's growth and development hinders effective intervention. Up to one in four Australian children are living with overweight or obesity, with poor movement behaviours, sedentary lifestyles, unhealthy diets, and inadequate sleep as primary contributors. Active play fosters motor skill development and lifelong health but faces barriers like overprotective caregiving and sedentary environments. Actionable strategies to enhance activity levels in this age group include providing educator training, developing online resources, fostering communities of practice, improving infrastructure, and advocating for policy changes. A coordinated effort by parents, caregivers, educators, and health professionals is essential to prioritise movement in early childhood, laying the foundation for healthier growth and reducing the burden of chronic diseases.

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1. Scene Setting

Media and research outlets provide a steady stream of reminders regarding the increasing prevalence of chronic health conditions in Organisation for Economic Co-operation and Development countries, including Australia. These reports frequently address conditions such as obesity, cardiovascular diseases, type 2 diabetes, osteoporosis, and depression. For example, the recent World Obesity Atlas 2024 details the global prevalence and consequences of obesity [1]. The etiology of many of these conditions invariably includes a lack of engagement in age-appropriate levels of physical activity. Many may not realise that the genesis of chronic health conditions occurs in the first 2000 days of life, that is, from conception to five years of age. A common scenario is that we do not focus on prevention but rather wait until a health problem occurs, (typically during adulthood), before choosing to intervene. Even more concerning is the added expectation that the system will “fix” us if we are unfortunate enough to face a serious health issue.

2. Relationship, Interaction, and Health Synergies Between Activity, Nutrition, and Sleep in Early Life

While more work is needed to determine the optimal dose of physical activity for health benefits in early life, the current consensus suggests that integrating regular physical activity into the daily routines of infants, toddlers, and preschoolers is important in optimizing health and development. Specifically, engagement in consistent activity is linked to enhancement of motor development, favorable body composition profiles, improved psychosocial well-being, and advanced brain development [2,3]. Likewise, reducing overall sedentary time—including screen exposure, prolonged sitting, and supine positioning—has been linked to beneficial effects on adiposity and motor development outcomes [4]. The findings regarding sleep are also interesting, with shorter sleep duration typically associated with higher adiposity, poorer emotional regulation, and impaired growth [5]. Nutrition habits are also equally pertinent to any of the factors listed above. In this context, the consensus remains that early life dietary practices can foster optimal growth and development in young children and also play a key role in establishing long-term food preferences and habits [6]. Importantly, existing evidence suggests that early-life dietary habits can influence key aspects of a child's growth, including brain development [7], and play a crucial role in shaping their long-term health trajectory. These habits can also significantly impact their susceptibility to developing chronic conditions later in life. The dynamic interplay among these three lifestyle factors creates a synergistic 24 h movement framework, shaping metabolism, neurodevelopment, immune function, and the risk of chronic diseases such as obesity. Their interdependence manifests in various ways. For example, physical activity and sleep share a bidirectional relationship, where regular activity enhances sleep quality, while poor sleep can lead to fatigue and reduced cognitive development. Similarly, sleep influences the endocrine environment, affecting the neurophysiological regulation of dietary intake and vice versa. Additionally, physical activity and nutrition work together to regulate energy balance, supporting muscle and bone development.

3. Benefits of Physical Activity

The benefits of physical activity for children and adolescents aged 5–17 is well-documented, encompassing enhanced well-being and cognitive function, among other advantages [8–10]. Nonetheless, this relationship in the early years (i.e., first 2000 days) remains relatively underexplored. Humans are inherently designed for movement, and regular physical activity from birth is essential for health, while its absence can contribute to a range of potential health issues. Increasing evidence highlights the critical role of physical activity and exercise across the lifespan, commencing with movement and active play from birth, is central to the prevention and management of chronic diseases [11]. Alongside proper nutrition, ensuring sufficient physical activity and sleep at every stage of life—starting from early childhood—represents one of the most cost-effective strategies for reducing disease risk and its associated burdens [12]. Notably, as emphasised in the World Bank's report *The Economic Benefits of Investing in Child Health*, early investments in child health generate significant economic and social advantages. These benefits include lowering childhood mortality by preventing disease, enhancing the cost-effectiveness of immunisation programs, improving cognitive and educational outcomes, and, in some cases, breaking the cycle of poverty [13]. As such, investing in early childhood is not only a moral imperative but also a strategic economic decision with high returns. Encouragingly, recent years have witnessed a surge in research highlighting the importance, impact, and feasibility of physical activity and active play in early childhood [2,4,5,14]. As a result, authorities are increasingly formalizing and standardizing practices through the publication

of well-researched guidelines specifically for children aged 0–4 years. However, achieving widespread implementation of these guidelines remains an ongoing challenge [15].

This brief paper addresses the importance of regular movement and physical activity, commencing with active play in the first 2000 days, and its critical role in the prevention and management of overweight and obesity and other related conditions [16,17]. We contend that a working knowledge and understanding of this evidence is of paramount importance to all parents, caregivers, and educators of young children.

4. Scale of the Problem

In Australia, there is limited information about the typical longitudinal changes in the growth, development, and body composition of young children. This gap largely stems from the historical failure to prioritise systematic measurements of size, shape, and body composition (including fatness) throughout childhood. For example, until recently, the global literature was lacking with respect to the body composition or ‘quality of growth’ of infants across the first 1000 days [18,19]. Despite the lack of Australian longitudinal data, current best estimates from cross-sectional studies are that a significant proportion of infants, children, and adolescents may be classified as living with overweight or obesity. The best-case scenario in Australia is that one in five children are living with overweight or obesity; the worst-case scenario may be as many as one in four children! Irrespective of the exact proportion, we can be confident that without appropriate intervention, the earlier poor body composition is established in life, the greater the likelihood of progression to overweight and obesity across childhood, adolescence, and into adulthood [20]. Given this trajectory, it is unsurprising that inappropriate movement behaviours—characterised by insufficient physical activity, excessive sedentary time, poor dietary habits, and inadequate sleep—serve as primary contributors to overweight and obesity during the formative years.

5. Physical Activity and Movement in the Growing Years

As mentioned, the benefits of physical activity to health and well-being of adults are very well-documented, but until recently, relatively less mainstream information has detailed the interrelationships between physical activity, fitness, and health during the growing years. Despite the recent publication of evidence-based guidelines, there is a fundamental lack of public awareness and appreciation of the foundational importance of movement and active play across the first 2000 days of life [21].

The lack of opportunities for young children to engage in sufficient active play and physical activity as they grow and develop remains a significant concern. Reduced opportunities for movement, an increase in sedentary behaviours, along with overprotective parents and caregivers, are contributing to low levels of habitual physical activity and reductions in activity energy expenditure. The constellation of limited play and activity opportunities, inactive behaviours, poor eating, and sleep habits, are major determinants of the increasing prevalence of overweight and obesity, and children would greatly benefit from the active involvement of both parents [22].

Ensuring appropriate movement behaviours from birth for all children should be a national priority. To achieve this goal, a coordinated approach is required from everyone who has an influence on the knowledge, attitudes, and behaviours of young children, including parents, caregivers, educators, and health professionals. A useful starting point would be for all stakeholders to have a sound working knowledge of individual variability in physical growth and development across the first 2000 days. Even better would be a detailed understanding of changes across the subsequent life stages of childhood and adolescence. An appreciation of normal variability in body size, shape, and composition, along with an acceptance of the central role of movement and active play in the growth

and development of children, would be ideal. Since young children rely heavily on adults for guidance and support, responsible role models play a crucial role in shaping movement behaviours. In fostering active play, adults must also consider the child's perspective, emphasizing a child-centred approach that maximises enjoyment and ensures safety.

6. Take Every Opportunity to Support Movement and Active Play

Young children crave the opportunity to explore their physical environment through active play and experimenting with the movement capabilities of their bodies. If movement is limited, or children are unnecessarily constrained by adults, this may have serious implications for motor development. The foundations or 'building blocks' of motor development and learning are facilitated through activity during the early years. This includes the progression from rudimentary movement skills to the development of fundamental movement (or motor) skills such as catching, kicking, running, jumping, and throwing [23]. Early movement experiences provide the foundation for the child to build more complex and skilled performances later with appropriate teaching and instruction. Across the first 2000 days, all children have a need and desire to participate in more vigorous and challenging self-initiated activities.

7. Movement and Active Play to Optimise Motor Control

Given the opportunity and encouragement, young children commonly engage in different types of active play depending on their age, stage of development, and their experiences of movement. For example, during infancy, activities involve gross motor movements that may not be purposeful or goal-driven. For many, this type of activity may peak part-way through the first year of life. Later, commonly at the beginning of the second year, many children become involved in more physically vigorous activities often described as gross motor movements within a playful context. For some, this type of play occurs in a social context, increases from toddler age onwards, and peaks at the end of the first 2000 days before declining during the primary school years [24]. If activity opportunities for young children are limited or restricted, the expectation of 'normal' skill progression and associated health benefits may not be achieved. When opportunities for movement are restricted, typical skill progression and the associated health benefits may not fully develop. Low levels of activity, particularly when combined with sedentary behaviours, increase the risk of unhealthy body composition, including excessive fat accumulation.

As with acknowledged individual differences in normal growth and development across the first 2000 days, there is also considerable variability in the attainment of motor milestones and other markers of physical maturation across the growing years. Particularly during the first 2000 days, young children receive and respond to sensory information from a wide range of internal and external stimuli. In the context of activity, their engagement in movement has been described as 'learning to move' and 'learning through movement'.

During the first 2000 days, socialisation becomes increasingly significant, shaping behavioural norms while children remain highly dependent on responsible adults to provide opportunities for active play. Over time, most young children progress from a more self-centred approach to actively seeking support and approval from others in relation to their physical performances, and continue to rely on parents, teachers, and other caregivers. The context in which movement and active play is fostered for children across the first 2000 days also influences the development of self-esteem and self-confidence, as well as feelings of mastery and competence. More vigorous play, including rough-and-tumble activities and so-called 'risky' play behaviours, contributes significantly to these developmental outcomes but is heavily influenced by adult supervision and attitudes.

Too often, many young children are restricted from experiencing a wide range of activity opportunities by adult caregivers.

In short, movement and active play, along with healthy eating and sleep behaviours across the first 2000 days, are essential ingredients in the prevention of overweight and obesity and other related chronic health problems. A variety of actionable strategies can be implemented to enhance activity levels in this age group, including (but not limited to) providing accessible training for educators, developing online tools and resources, fostering communities of practice, improving physical infrastructure, and advocating for policy changes [25,26]. Measures such as enhancing activity spaces with varied terrains, open areas, and diverse play equipment, which promote active play, exploration, creativity, and problem-solving, should be prioritised, especially when they are relatively easy to implement [27]. Investing in methodological frameworks like “complexivist bricolage”, which frames teaching and learning in physically active play as a collaborative exploration between children and teachers, could help standardise practices in the field and promote greater equity [28]. Last but not least, adequate consideration of contextual differences such as economic climate and circumstances in various localities is important as there is documented evidence regarding adherence to optimal levels of activity in different regions [29].

8. Summary

- Early establishment of appropriate movement behaviours (activity, eating, and sleep) is critical across the first 2000 days.
- All children should be provided with every opportunity to engage in fun and enjoyable movement and active play.
- Experiencing a measure of success in the activity setting influences engagement in habitual physical activity across childhood, adolescence, and into adulthood.
- Movement competency is likely to have a bearing upon participation levels in later years.
- A wide range of movement and active play experiences across the first 2000 days helps to promote enjoyment and spontaneity in the activity setting.
- In contrast, poor activity experiences from a young age may contribute to lower levels of participation and may be a major contributor to unhealthy body composition.
- Quality activity opportunities are essential for the development of health and motor-related components of fitness.
- An understanding of individual variability in body size, shape, and composition across the growing years is critical for children and adults.
- For young children with an unhealthy body composition, a focus on movement behaviours may be the most important gift society can provide.

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