



Climate emergencies, physical activity recommendations, and people with disabilities: new reflections

Emergências climáticas, recomendações de atividade física e pessoas com deficiência: novas reflexões

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ABSTRACT

Introduction: The letter entitled “Physical activity recommendations for health in the context of climate change: are we paying enough attention?”, recently published, highlighted the need to revisit physical activity (PA) recommendations for health in light of the growing scenario of climate emergencies. **Objective:** To broaden this debate by explicitly incorporating the perspective of people with disabilities. **Development:** It is estimated that approximately 16% of the global population and about 14.4 million people in Brazil live with some type of disability, a group that, on average, presents higher levels of sedentary behavior and lower participation in PA compared with people without disabilities. Despite this, current international PA guidelines are largely based on evidence derived from populations without disabilities and from high-income countries, which limits their direct applicability to groups with greater functional heterogeneity and who face additional structural barriers to engaging in PA. These limitations become even more relevant in low- and middle-income countries and in the context of climate emergencies, in which extreme events such as heat waves and environmental degradation may further restrict opportunities for safe PA practice. **Final considerations:** In this scenario, generalized recommendations may present limitations in terms of both feasibility and safety for people with disabilities. Therefore, there is a need for more inclusive and context-sensitive approaches that simultaneously consider functional diversity, social inequalities, and the additional challenges imposed by climate emergencies.

Keywords: Physical exercise; Para athletes; Persons with disabilities; Sports for people with disabilities; Terminology.

RESUMO

Introdução: A carta “As recomendações de atividade física para a saúde no contexto das emergências climáticas: estamos suficientemente atentos?”, publicada recentemente, destacou a necessidade de revisar as recomendações de atividade física (AF) para a saúde diante do cenário crescente de emergências climáticas. **Objetivo:** Ampliar esse debate ao incorporar explicitamente a perspectiva das pessoas com deficiência. **Desenvolvimento:** Estima-se que aproximadamente 16% da população mundial e cerca de 14,4 milhões de pessoas no Brasil vivam com algum tipo de deficiência, grupo que apresenta, em média, maiores níveis de comportamento sedentário e menor participação em AF quando comparado à população sem deficiência. Apesar disso, as atuais diretrizes internacionais de AF são amplamente baseadas em evidências produzidas em populações sem deficiência e em países de alta renda, o que limita sua aplicabilidade direta a grupos com maior heterogeneidade funcional e que enfrentam barreiras estruturais adicionais para a prática de AF. Essas limitações tornam-se ainda mais relevantes em países de baixa e média renda e no contexto das emergências climáticas, nas quais eventos extremos, como ondas de calor e degradação da qualidade ambiental, podem restringir ainda mais as oportunidades de prática segura. **Considerações finais:** Nesse cenário, recomendações generalistas podem apresentar limitações tanto em termos de viabilidade quanto de segurança para pessoas com deficiência. Assim, argumenta-se pela necessidade de abordagens mais inclusivas e sensíveis ao contexto, capazes de considerar simultaneamente a diversidade funcional, as desigualdades sociais e os desafios adicionais impostos pelas emergências climáticas.

Palavras-chave: Exercício físico; Para-atletas; Pessoas com deficiência; Esportes para pessoas com deficiência; Terminologia.

We read with great interest the letter by Porto et al.¹, which provides a timely reflection on the adequacy of physical activity (PA) recommendations for health in

the context of climate emergencies. We commend the authors for bringing to the scientific debate a topic of considerable relevance to contemporary public health,

particularly given the increasing frequency and intensity of extreme climate events and their potential impacts on both opportunities for and the safety of PA participation. In line with this call for reflection and action, the purpose of this letter is to broaden the discussion by explicitly incorporating people with disabilities (PwD). This population group remains frequently underrepresented in global PA guidelines and may be disproportionately affected by both the structural barriers to PA participation and the adverse consequences of climate change.

In addition to the environmental and social barriers previously discussed, certain conditions associated with different types of disability may increase physiological vulnerability during extreme climate events, particularly under conditions of intense heat. In individuals with spinal cord injury (especially those with high paraplegia or tetraplegia), for example, impairments in autonomic control compromise thermoregulatory mechanisms, reducing the ability to dissipate heat during exercise. Among individuals with limb amputations, changes in the body surface area available for heat exchange, combined with the increased energetic cost of locomotion, may contribute to greater physiological strain in hot environments. Similarly, individuals with cerebral palsy or neuromuscular disorders often experience early fatigue and reduced heat tolerance, whereas those with sensory or cognitive impairments may face greater challenges in recognizing or interpreting environmental warning signs. In this context, the interaction between adverse climatic conditions and specific physiological or functional characteristics may impose additional challenges to the safe practice of PA among PwD. Therefore, generic PA recommendations in the context of climate extremes may be inadequate or potentially unsafe for some segments of this population, reinforcing the need for approaches that are more sensitive to the existing functional heterogeneity.

It is estimated that approximately 16% of the global population and about 14.4 million people in Brazil live with some type of disability (<https://censo2022.ibge.gov.br/panorama/>), a population group that, on average, exhibits higher levels of sedentary behavior and lower participation in PA compared with people without disabilities². Furthermore, due to persistent social and structural inequalities, PwD are at greater risk of developing adverse health outcomes, including obesity, cardiovascular disease, and type 2 diabetes mellitus². In this context, regular participation in PA represents a fundamental strategy for promoting health, maintain-

ing functional capacity, and preserving independence across the lifespan. However, developing a single set of PA recommendations capable of addressing the broad diversity of health conditions, functional limitations, and physiological profiles among PwD remains a significant challenge³. The adoption of uniform recommendations may result in either underestimation of exercise load, leading to insufficient physiological stimulus, or overestimation of physical demands, increasing the risk of injury or adverse events³. The heterogeneity of disabilities, encompassing both congenital and acquired conditions, varying levels of functional impairment, and diverse clinical profiles, requires caution when applying generalized recommendations. Despite these particularities, widely disseminated guidelines, such as the World Health Organization PA recommendations and the Physical Activity Guidelines for Americans, largely apply the same parameters to people with disabilities as those established for adults without disabilities. These recommendations advise accumulating 150–300 minutes per week of moderate-intensity aerobic PA or 75–150 minutes of vigorous-intensity PA, in addition to muscle-strengthening activities on two or more days per week and reducing sedentary behavior^{2,3}. However, these parameters have been developed predominantly from evidence derived from populations without disabilities, limiting their direct applicability to groups with distinct physiological and functional characteristics.

International evidence indicates that adults with disabilities may be up to 62% less likely to achieve the recommended 150 minutes per week of moderate-to-vigorous PA compared with adults without disabilities⁴. Furthermore, current guidelines place limited emphasis on the principles of training progression required for individuals with functional limitations to safely and sustainably achieve recommended PA levels. Individuals undergoing rehabilitation or adapting to wheelchair use, for example, often require progressive and individualized exercise prescriptions, including clearly defined intermediate goals, before reaching the thresholds proposed by existing guidelines. These limitations become even more evident when considering the structural realities of low- and middle-income countries⁵. In such settings, socioeconomic inequalities, limited availability of accessible and safe public spaces, restricted access to qualified professionals, assistive technologies, and rehabilitation services, as well as cultural and informational barriers, substantially hinder engagement in PA²⁻⁴. In many countries, PA occurs

predominantly within transportation and occupational domains rather than during leisure time, reflecting reduced opportunities for voluntary and planned participation in PA among people with disabilities.

In this context, climate emergencies add an additional layer of complexity. Within a setting marked by socioeconomic and regional inequalities, events such as heat waves, floods, and deteriorating air quality have unequal impacts across different populations within the same country or city and may further restrict opportunities for PA participation. In large urban centers, peripheral areas often experience inadequate infrastructure, residential clusters located in high-risk zones, and average temperatures that may exceed those observed in greener neighborhoods with better urban infrastructure. Likewise, riverine populations and residents of arid or desert-climate regions may face heightened risks and consequences associated with extreme climate events, including severe flooding and prolonged droughts. For PwD, these constraints may be even more pronounced, given their greater reliance on accessible environments, adapted transportation, specialized equipment, and professional support to engage in PA.

It is important to emphasize that PwD constitute an extremely heterogeneous population and that many do not present physiological limitations directly related to their condition. Therefore, the particularities discussed here apply to specific conditions and reinforce the need for individualized assessments, without assuming reduced functional capacity or diminished potential for physical activity participation. In this context, the current scenario prompts reflection on the need to adapt the Brazilian Physical Activity Guidelines not only concerning recommended physical activity thresholds but also in relation to a broader understanding of the etiology of different disabilities and their implications for interaction with and adaptation to the environment, grounded in a comprehensive biopsychosocial framework. Such a process should incorporate an intersectional approach, recognizing that opportunities, barriers, and experiences related to physical activity participation are shaped not only by disability but also by other social determinants, including gender and sex, socioeconomic status, and race/skin color, all of which may exacerbate situations of vulnerability and health inequities.

Thus, the discussion proposed by Porto et al.¹ reveals an additional and highly relevant gap: the need to explicitly incorporate the specificities of PwD into reflections on PA recommendations in the context of

climate emergencies, particularly when considering the important socioeconomic intersections that characterize many low- and middle-income countries. Recommendations derived predominantly from evidence generated in high-income countries and among populations without disabilities may have limited applicability in settings marked by greater social inequalities, structural constraints, and functional diversity. In light of this scenario, we believe that future revisions of PA recommendations should move toward more inclusive and context-sensitive approaches. This entails recognizing the heterogeneity of disability conditions, incorporating principles of gradual exercise progression, considering different levels of functional capacity, and developing implementation strategies that are compatible with the social, environmental, and climatic realities of different regions of the world.

In summary, although current PA recommendations represent an important global framework for health promotion, their direct application to PwD, particularly in low- and middle-income countries and within the context of climate emergencies, remains limited from both scientific and practical perspectives. Expanding the debate initiated by Porto et al.¹ to explicitly include this population constitutes a fundamental step toward the development of PA recommendations that are more equitable, context-sensitive, and effectively applicable across diverse population groups. Such progress is essential to ensure that PA guidelines fully achieve their intended role as effective tools for health promotion and for reducing health inequities on a global scale.

Conflict of interest

The authors declare no conflict of interest.

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Author's contributions

Ribeiro Neto F: Conceptualization; Investigation; Project administration; Visualization; Writing – original draft; Writing – review & editing; Approval of the final version. Bezerra SAS e Winckler C: Conceptualization; Investigation; Supervision; Writing – review & editing; Approval of the final version.

Declaration regarding the use of artificial intelligence tools in the article writing process

The authors declare that the English version of the manuscript

was translated by the authors themselves, with the assistance of the artificial intelligence tool ChatGPT (OpenAI), used as support for translation, grammatical review, and the improvement of academic writing in the English language. All scientific content, interpretation of results, arguments presented, and the final version of the text were fully reviewed, verified, and approved by the authors, who assume full responsibility for the accuracy, integrity, and quality of the submitted manuscript

Availability of research data and other materials

The contents underlying the research text are contained in the manuscript.

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Reviewers' assessment

The reviews of this article were originally conducted in Portuguese. This version has been translated using ChatGPT and subsequently reviewed by the Chief Editors.

Reviewer A

Anonymous

Comments to the author

- The editorial presents pertinent and relevant recommendations regarding the need to expand the debate on guidelines for healthy physical activity practice among people with disabilities (PWD). The critique and the warning about the need for individualized and careful assessment of each case, in order to verify the applicability of international evidence-based guidelines developed from samples in which PWD are underrepresented, should be taken into account. The editorial provides examples of physiological particularities associated with certain disabilities and also highlights climate-related issues that may increase the risk of engaging in physical activity without specific guidance. As a suggestion, the authors should consider whether it would be appropriate to add a sentence to the text to avoid a generalized assessment that all PWD have physiological restrictions associated with their condition, so as not to reinforce a depreciative view of PWD, as if they were more “fragile” or “less capable.” Certainly, PWD should receive appropriate professional attention in planning regular physical activity, as should other conditions that deviate from the standards of the majority of the healthy young population. Therefore, a PWD reading the editorial should understand that this is the authors' intention, as they are highly knowledgeable about both the

specific needs and the potential of this population.

Final decision

- Accepted for publication in its current format

Reviewer B

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Comments to the author

- The reflection is relevant, appropriate, and necessary. As a suggestion, I recommend considering and including some discussion about the Brazilian Physical Activity Guidelines. Additionally, it would be important to address intersectionality, considering people with disabilities (PWD), gender, socioeconomic status, and skin color.
- I suggest not using the plural form in the acronym PWDs. The acronym PWD already functions as an invariable form.
- Page 4, Line 21: In the sentence “applied to people with disabilities... the same parameters,” I suggest revising to “are applied to people with disabilities...” or “are adopted for people with disabilities...”
- Page 6, Line 3: In the sentence “large floods,” I suggest replacing it with “floods of great magnitude and prolonged droughts.”

Final decision

- Minor revisions required