

## Exercise and Physical Activity Diversity

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### Abstract

In this reflective opinion piece, we introduce the concepts of exercise diversity and physical activity diversity. Similar to dietary diversity and dietary variety, exercise/physical activity diversity represents part of a comprehensive target of ideal health, an objective parameter to audit one's progress towards such a goal, and a means of accomplishing this aim. We define this concept as the number of types of exercise, the number of limbs and body parts exercised or muscle groups involved, the variety of intensity, or the number of variations in methods of exercise used. A non-weighted score may be allocated to each exercise, limb, and muscle group to get a raw idea of diversity.

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### Introduction

The World Health Organization (WHO) defines physical activity (PA) as any bodily activity produced by skeletal muscle that requires energy expenditure.<sup>1</sup> PA strongly predicts morbidity and mortality risk due to major non-communicable diseases (NCDs) like cardiovascular disorders, hypertension, diabetes, obesity, dyslipidaemia, bone and joint infections (osteoporosis and osteoarthritis), and depression. Lack of PA is recognized as a major modifiable risk factor for most of these NCDs. Despite enough evidence stating the protective role of PA to protect against these prevalent NCDs, adequate PA is abysmally low. The global age-standardized prevalence of insufficient PA was around 27.5% in 2016 and was higher among women (31.7%) than men (23.4%). Physical inactivity accounted for 1.3 million deaths in 2017 globally.<sup>2</sup> Exercise, a component of PA, is a structured activity specifically planned to develop and maintain physical

fitness. With increasing age, the maintenance of adequate PA can support healthy aging. Physical fitness itself is a vast construct, including health-related and motor-performance fitness.

### Variability and Variety

WHO offers person-centric recommendations for PA based on the age, phase of life, and comorbid health/disability status of the person. These guidelines do allude to the vast diversity of PA. For example<sup>1</sup>

“Children 1-4 years should spend at least 180 minutes in various types of physical activities at any intensity.”

“Adults should also do muscle-strengthening activities at a moderate or greater intensity that involve all major muscle groups on 2 or more days a week.”

“Older adults should do varied multicomponent physical activity that emphasizes functional balance and strength training.”

“All pregnant and post-partum women without contraindication should incorporate various aerobic and muscle-strengthening activities.”

Unlike the commonly used term ‘dietary diversity’, there is no mention of the term ‘exercise diversity’(ED) or ‘physical activity diversity’ (PAD) in medical literature. These terms refer to ethnic and racial diversity in competitive and recreational sports.<sup>3,4</sup> This is surprising because ED or PAD are important components of the overall physical fitness regimen. It is also in contradistinction to the field of nutrition, where the phrase ‘dietary diversity’ is well entrenched. Dietary diversity is the number of unique food groups consumed over time and can be measured by a validated Dietary Diversity Score (DDS).<sup>5</sup> The terms ‘dietary diversity’ and ‘dietary variety’ can be used interchangeably or to refer to the number of food groups and food items separately.<sup>6</sup>

### Diversity in Exercise

Just as dietary diversity relates to dietary quality and health outcomes, ED or PAD are linked with quality and outcomes. There are different ‘groups’ of exercise: balancing, flexibility, aerobic, and resistance. All are equally important for fitness and health. All muscle groups working at different joints

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**Table:** Proposed exercise diversity score/ physical activity diversity score.**Exercise Score**

- Balancing
- Flexibility/stretching
- Aerobics
- Resistance/ strengthening

**Muscle Score**

- Upper limbs
- Lower limbs
- Chest
- Back

**Variation Score**

- Variation in venue/ ambience of exercise
- Variation in type of exercise
- Variation in timing of exercise
- Variation in exercise companion

**Intensity Score**

- Low intensity
- Moderate intensity
- High intensity
- High impact aerobics

must be exercised/sufficiently mobilized to ensure optimal functionality. Different exercise means may be adopted to prevent boredom and enhance the exercise experience. In all these ways, the concept of ED and PAD are similar to those of dietary diversity and variety.

We, therefore, call for a discussion on ED and PAD. While conceptualizing it is relatively easy, defining ED or PAD is challenging. It may be perceived as the number of types of exercise, the number of limbs and body parts exercised or muscle groups involved, the variety of intensity, or the number of variations in methods of exercise used. A non-weighted score may be allocated to each exercise, limb, and muscle group to get a raw idea of diversity. The Table shows a proposed scoring system, which can be used to assess exercise diversity.

The rubric includes four sub-scores based on the type of exercise, muscle group utilization, intensity, and variety of exercise. These can be taken as an ED score if referring to exercise. The first three can be used to calculate a PAD score as well. The 4x4 framework we propose makes it easy to understand and practice. The ED/PAD score will find maximal utility if used in conjunction with objective tools of exercise measurement, such as accelerometers and others.<sup>7</sup>

**The Way Forward**

Physical activity and exercise are important means of lifestyle management, and they continue to increase in prevalence; their necessity is bound to grow. This is reflected in the emergence of sports and exercise medicine as distinct specialties.<sup>8</sup>

To improve, however, it should be accompanied by an assessment of exercise and physical activity diversity. This will ensure a comprehensive evaluation of the vast spectrum of these therapeutic modalities. We hope this opinion piece will stimulate further rationalization and research on this topic.

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