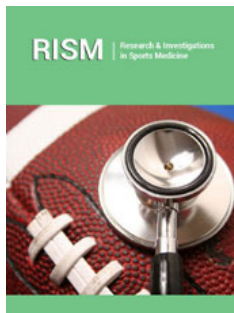



Further Defining High-Intensity, Multimodal Exercises, and Functional Training as Part of the Working Definition for High-Intensity Functional Training

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Introduction

A working definition of High-Intensity Functional Training (HIFT) has been provided stating that, “[HIFT] is a training style (or program) that incorporates functional, multimodal movements, performed at a relatively high intensity, and designed to improve parameters of general physical fitness and performance” [1]. This working definition has initiated a starting point to more clearly describe this new exercise training program and has provided a platform for those in the field to build upon. However, this definition leaves much room for questions and interpretation. For instance, what is “relatively high-intensity”? Multimodal has been used in the description of aerobic training as well as improving golf performance and requires further clarification as it relates to HIFT [2,3]. Lastly, functional training and functional exercise or movements have been used within the literature with no clear definition or distinction between functional training and functional exercises [4,5]. Therefore, it is important to further support the working definition by quantifying HIFT intensity as well as provide perspectives on the use of the terms multimodal and functional as they relate to training and exercise.

Quantifying High-Intensity Functional Training

Exercise intensities have previously been quantified for both cardiorespiratory endurance exercise and resistance training [6]. Though, no quantification of high-intensity has been provided for HIFT. HIFT has been described as taking an autonomous approach placed on the athlete or coach to make the movements or combination of movements intense by pace, load, reps or some combination [1,7,8]. However, in order to be considered high-intensity training, workouts must meet already accepted high or vigorous intensities [6]. Previous studies have quantified physiological responses to various HIFT workouts (displayed in Table 1) and may provide quantifiable support for HIFT being high-intensity exercise. Cardiovascular and metabolic variables, as well as subjective perceived exertion displayed in Table 1, quantitatively define HIFT as high-intensity as performance across multiple workouts yielded values within the classification of vigorous intensity [6]. This evidence supports that HIFT may provide an environment in which people autonomously exercise at a high-intensity.

Table 1: Intensity of HIFT workouts.

	HRav (bpm)	VO ₂ av (ml/kg/min)	%HRmax	%VO ₂ max	RPE	METs
Fran [9]	179.0 ± 8.4	29.1 ± 1.1	95.4 ± 3.0	56.7 ± 6.2	X	~8.31
Fran [10]	159 ± 10.62	44.5 ± 8.3	88.0 ± 6.45	79.5 ± 12.1	~15**	~10.9
Fran [11]	176 ± 6	X	91 ± 4%	X	~9*	X
Cindy [9]	182.2 ± 6.6	34.4 ± 3.5	97.4 ± 2.4	66.2 ± 4.8	X	~9.83
Cindy [12]	170.8 ± 13.5	33.5 ± 5.5	91 ± 4.2%	63.8 ± 12.3	X	~9.5
Cindy [13]	174.1 ± 2.6	X	~90.4%	X	~6*	X
Donkey Kong [10]	164.5 ± 10.03	34.5 ± 7.23	91.0 ± 4.55	84.5 ± 5.35	~17**	~11.6
Fight Gone Bad [11]	174 ± 3	X	90 ± 3%	X	~10*	X
Modified Rahoï [14]	X	37.0 ± 4.8	X	X	X	~10.6

Abbreviations: HRav: Average Heart Rate; VO₂av: Average Oxygen Consumption; %HRmax: Percentage of Maximum Heart Rate, %VO₂max: Percentage of Maximal Oxygen Consumption; RPE: Rate of Perceived Exertion; METs: Metabolic Equivalent

*Note: Rate of Perceived Exertion Scale 0-10

**Note: Rate of Perceived Exertion Scale 6-20

Multimodal Exercises

As previously described, HIFT is a modality of training consisting of multimodal movements or exercises [1]. Mode is the way, manner, fashion, method, form, style, technique, approach, or procedure of something. Essentially, mode describes a type of treatment, training program, or exercise [15-17]. Multimodal exercise describes multiple types of exercise. Though, aerobic training also utilizes multimodal exercises consisting of rowing, running, and cycling; what differentiates HIFT multimodal exercises from others, like HIIT, is the multicomponent nature of HIFT [2].

HIFT aims to improve parameters of general physical fitness and performance [1]. General physical fitness is defined as, “a state of ability to perform sustained physical work characterized by an effective integration of cardiorespiratory endurance, strength, flexibility, coordination, and body composition” [18]. There are five health-related components of physical fitness: body composition, muscular strength, muscular endurance, flexibility, and cardiorespiratory fitness [19]. Unlike training programs, such as HIIT, which may only challenge a single component of physical fitness, HIFT challenges multiple components of physical fitness. This supports the definition that HIFT consists of multimodal movements/exercises which challenge multiple components of physical fitness to improve general physical fitness and performance.

Functional Exercise and Training

No distinctly supported definition exists as to what comprises functional training and/or functional exercise within a healthy

population. Functional exercise is common within dependent populations in which functional capacity has been lost as functional incapacity refers to the inability to perform normal activities of living [5,20,21]. This indicates there must be a loss of function before there is functional exercise. However, this is not relevant to a healthy population participating in HIFT.

Functional exercises within HIFT are those that, “involve whole body, universal motor recruitment patterns in multiple planes of movement such as squats, deadlifts, cleans, snatches, pull-ups, vertical jumps, and more” [1,8,22,23]. This may provide a starting point in describing functional exercises, though, classifying some exercises as functional would imply others are non-functional. Also, the list of movements (and workouts in Table 1) lack multiplanar movements as they all occur along the sagittal plane lacking multiplanar movement. Lastly, it may be argued that some single joint exercises assist to maintain or improve human body function as well [24,25]. It may not be appropriate to classify exercises as functional as all exercise aims to improve or maintain human body function.

Though exercise may not be classified as functional, we may be able to distinguish training as “functional training” like aerobic and resistance training. While training and exercise are commonly used interchangeably, training is distinct from exercise in that training consists of undertaking a course of exercise and exercise is a subset of physical activity [26]. It may be postulated that what distinguishes functional training as “functional” is that it challenges multiple components of physical fitness. Functional training focuses on improving strength, flexibility,

coordination, spinal stability, and balance to improve functional capacity [5,27-29]. Superior levels in all components of physical fitness may provide optimal human body function. Given that HIFT utilizes multiple modes of exercise to improve general physical fitness (which consists of multiple components) it may be classified as functional training.

Conclusion

In conclusion, evidence further substantiates as well clarifies the working definition for HIFT. Cardiovascular, metabolic, and perceived exertion values quantitatively corroborate the classification of HIFT as high-intensity. Upon further examination of the literature, a clearer description of the term multimodal has been provided and these multimodal exercises challenge multiple components of physical fitness. Lastly, upon further exploration of the term functional (as used in conjunction with training and exercise), it may not be appropriate to classify exercises as functional as we would then assume other exercises as non-functional. Though, it was substantiated that HIFT is functional training in that it focuses on multiple components of fitness. HIFT may be further described as a functional training program, consisting of multimodal exercises performed at a high-intensity, designed to challenge and improve multiple components of general physical fitness and performance.

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