CONCEPTS OF HIGH INTENSITY INTERVAL TRAINING: A KEY OF ENHANCED SPORTS PERFORMANCE

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ABSTRACT

High Intensity Interval Training (HIIT) is a type of high and low intended exercises in a certain time interval. It is very effective and efficient to improve the physical parameters. This study aims to explore the concepts of HIIT on gaining sound health and enhancing sports performance in respective sport. The type of research method used in this study is descriptive and for this, articles published on HIIT were taken for clarifying the benefits of HIIT. The study concluded that, Exercises of High Intensity Interval Training is significantly beneficial in optimizing the sports performance and provides future directions for research.

Keywords: *Fitness, Interval Training, Sports Performance, Health etc.*

Introduction

Achievements of an athlete is always related to how he/she practices, what is practiced and what its purpose. Selection of right type of exercise and training methods will support the success of the exercise itself. The aim of any type of sports training is to achieve maximum individual or team efficiency in a selected sports discipline.In any athletic movement, the human body works as a fully integrated system and needs to be trained in such a way to maximise performance, reduce risk of injury and produce best results. The quality and intensity of movement are the key areas to ensure effective progression towards thegoal performance. There are four major parts of while designing a sports training program i.e. conditioning training (strength training, endurance training; and flexibility training); technical training; tactical training; and psychological training. Now-a-days HIIT training is one of the best methods and right kind of exercise as it very efficient and effective method to develop and improve the physical components.

Research Method

This study used descriptive research method to identify the benefits of HIIT exercises in the enhancement of performance across various sports disciplines.

Methodology

What is HIIT?

High-Intensity Interval Training (HIIT) or High-Intensity Intermittent Exercise (HIIE) is a cardiovascular exercise strategy alternating short periods of intense anaerobic exercise with less intense recovery periods, until too exhausted to continue. Though, it is also known as SIT Training i.e. Sprint Interval Training which can improve cardiac performance and impact on the body's metabolism is also increased sharply. Metabolism herein relates to the body's ability to convert fat into energy. However, there is no universal duration of HIIT session, these intense workouts typically last under 30 minutes, with times varying which is based on current fitness level of an individual. Largely, the intensity of HIIT also depends on the duration of its session. HIIT may not be as effective for treating hyper lipidaemia and obesity, or improving muscle and bone mass. However, research has shown that HIIT regimens produced significant reductions in the fat mass of the whole-body in young women.

High-intensity interval training (HIIT) identifies any exercise that alternates between intense activity bursts and defined less-intense activity intervals or even complete rest.

For instance, a good starter workout is running as fast as for 1 minute and then walking for 2

minutes. For a 15-minute, fat-burning workout, repeat that 3-minute interval five times. It sounds too easy to be effective, but science suggests it's worth the workout style.

If you want to get in a workout during your lunch break or to get in shape for a fast-approaching case, HIIT is the perfect workout for a busy schedule. Research demonstrates that in a mere 15 minutes of interval training (done three times a week), you can make more success than the person who jogs for an hour on the treadmill.

High Interval Intensity Training is ideal workout for a busy timetable–whether someone want to congestion in a workout through outthe lunch break or to get in shape for a fast-approaching occurrence. Many studies show that an individual can achieve more progress in a measly 15 minutes of interval training (performed3 times a week) than an individual performing jogging on the treadmill for an hour.

Procedure for HIIT

Training sessions for High Intensity Intervals normally consist of a warm-up cycle accompanied by repetitions of high intensity exercises separated for recovery by medium intensity exercises, then a cool down period. At maximum intensity, HIIT exercises to be conducted. The medium workout should have an intensity of about 50 percent. The number and length of the repetitions depend on the exercise.

The number of repetitions and duration of each one depends on the exercise, but with only 20 seconds of intense exercise, it can be as few as three repetitions. The basic exercises conducted during the portions of high intensity differ. Most of the HIIT research was done using a cycling ergometer, but other exercises such as a rowing ergometer, biking, climbing stairs, and walking uphill can also be effective.

There is no clear HIIT formula. The moderate-level speed can be as slow as walking, depending on one's level of cardiovascular growth. For example, a typical formula requires a 2:1 ratio of work to recovery periods, 30-40 seconds of hard sprinting alternated with 15-20 seconds of jogging or walking, repeated to failure.It will last between four and thirty minutes for the entire HIIT session, which means it is an excellent way to optimize a workout constrained by time constraints. To preserve precise times, the number of rounds, and speed, it is recommended to use a clock or timer.

Effects of HIIT

- **Cardiovascular Effects**

A systematic review and meta-analysis of randomized controlled studies in 2015 found that HIIT training and conventional endurance training can contribute to substantially improved cardiovascular fitness in healthy adults aged 18-45, although those engaging in the HIIT exercise routine have seen greater improvements in VO2 max. Another study has found that one month or longer HIIT regimens effectively boost adolescent cardiovascular health and lead to mild changes in body composition. In addition, a separate systematic review and meta-analysis of seven small randomized controlled trials found that HIIT (defined as four four-minute intervals at 85-95 percent of max heart rate with three-minute intervals at 60-70 percent of max heart rate) was more effective at improving blood vessel function and markers of blood vessel health than moderate-intensity continuous training.

A 2015 meta-analysis comparing HIIT in people with coronary artery disease to moderate intensity continuous training (MICT) found that HIIT leads to greater changes in VO2 max, but that MICT leads to greater decreases in heart rate and body weight. A 2014 meta-analysis showed that the cardiorespiratory fitness of people with lifestyle-induced chronic cardiovascular or metabolic disorders (including high blood pressure, obesity, heart failure, coronary artery disease, or metabolic syndrome) who completed an HIIT exercise program was almost twice that of people who completed a MICT exercise program, as calculated by VO2 max.

- **Metabolic Effects**

Relative to continuous exercise or monitoring conditions, HIIT substantially decreases insulin resistance and leads to modestly lowered fasting blood glucose levels and increased weight loss compared to those who do not undergo physical activity intervention.Another

research showed that HIIT at fasting insulin levels was more successful than moderate-intensity continuous training (31 percent decrease and 9 percent decrease, respectively).

- **Fat Oxidation**

HIIT's physiological effects on fat oxidation in moderately active women were investigated in a 2007 report. HIIT (defined as ten sets of 4-minute cycling bursts at an intensity of 90 percent VO2max separated by 2 minutes of rest) was performed every other day over a 2-week duration by the study participants.The study found that in moderately active women, seven HIIT sessions over a 2-week span increased the oxidation of whole-body fat and the capacity for skeletal muscle to oxidize fat. The findings of HIIT on fat loss were summarized in a 2010 systematic review of HIIT and reported that HIIT can lead to modest reductions in subcutaneous fat in young and healthy individuals, but greater reductions in overweight person. A 2018 meta-analysis of 39 studies found that HIIT, particularly running, was a time-efficient strategy for reducing deposits of abdominal and visceral fat mass.

- **Brain Power**

A 2017 study explored the impact of HIIT among a group of children on cognitive performance (N=318). The authors show that when compared to "a blend of board games, computer games, and trivia quizzes" HIIT is beneficial for cognitive control and working memory ability, and that this effect is mediated by the polymorphism of BDNF. The study concluded "a promising alternative to improve thought process, via short and potent exercise routines" A meta-analysis by the same group found that High Intensity Interval Training, like those normally observed with aerobic exercise, would induce short-term brain improvements.

What workouts work with HIIT?

HIIT is familiar as a cardio workout, and it's true that it does lend itself well to cardio-based sprints, whether you're running, on a bike, or on a rower. But, HIIT can be used as strength-based workouts too. HIIT routines that involve bodyweight work or added weight, such as kettlebells, medicine balls, or dumbbells, will work on muscles while spiking heart rate.

An individual or a trainer need to make sure about chosen exercises that encourage to be explosive, instead of moving like a bench press or lat pull-downs, push-ups, squats, or kettle-bell swings.

Some errors or safety matters to avoid?

Speaking of exercise choice, one mistake Tamir sees a lot is people trying to go all-out on moves when they don't have the form down.

"The safer movements are going to be more bodyweight movements,". "When you add weight, technique is really important. A proper warm-up is also vital, while doing cardio-based HIIT or strength-based HIIT. This should comprise mobility changes, like hip-opening stretches and thoracic spine turnings, as well as slower-tempo repetitions of the exercise you aim to use for HIIT, like squats.

While doing correct HIIT or modified interval training, don't underestimate the importance of recovery: Prioritizing frequent, intense workouts while neglecting rest days can not only lead to diminishing performance returns with your fitness, but can also leave you open to injury, fatigue, or burnout, as SELF recently reported. Bound the HIIT to 1 or 2 workouts a week, and make sure you're balancing them with plenty of easy workouts—as well as at least one conventional recovery day per week.

Discussion and Conclusion

In conclusion, High-intensity interval training is currently among top fitness trends in the world. It is a training technique that requires high effort through intense burst of exercise followed by short rest period. According to recent researches, supervised HIIT can lead to beneficial impact on athletic performance and fat loss but should not be used by an inexperienced individual as well as elder population. There is lot of benefit of HIIT on health and fitness as discussed in the article. Many researches on HIIT highlights the significant benefits on the various parameters of sports performance.

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