# A PRELIMINARY STUDY ON IMPLEMENTATION OF AEROBIC FITNESS TRAINING IN TENNIS COACHES' TRAINING PROGRAM

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**ABSTRACT**

The main aim of this study was to explore the implementation of aerobic fitness training among Malaysian tennis coaches in their training program. Eight qualified with tennis specific and sports science accreditations tennis coaches were interviewed. Their average age and total years of coaching experience are 39.3 ± 10.6 years and 14.9 ± 8.6 years respectively. Five themes were emerged from the qualitative analysis which are the type of training, training period, training frequency, training duration, and training intensity. Analysis of the interviews indicated that the coaches usually allocated about 2 to 4 weeks for aerobic fitness training with frequency of 3 sessions in a week. The coaches also prefer to conduct running activities within 20 to 45 minutes. However, none of the coaches monitor or properly control the aerobic fitness activities. Thus, this study suggesting a specific aerobic fitness training program for tennis players to be developed to assist the coaches conducting a proper aerobic fitness training in the future.

## INTRODUCTION

According to Bompa & Haff (2009), a training program is an organised set of training activities which developed based on the scientific findings, practical experience, previous training models, and based on training principles. As for training principles, in general, it consists of the frequency, intensity, time or duration, and type of training. Implementation of some of the principles, for instance, the frequency and intensity of training, does not necessarily need to be high all the time. It should be specific and fits the unique needs of the individual and the demands of the game (Holly & Shaffrath, 2001).

Fitness training in tennis should not be solely focused on the anaerobic energy systems even though the game is considered as a predominant anaerobic sport due to its quick and explosive nature. On the other hand, the aerobic fitness training is also important for tennis players because the match duration is unpredictable and the game is physically and physiologically demanding (Konig et al., 2001). Thus, the players should have a good aerobic fitness to play throughout the match (Kovacs, 2006). In addition, the game is interspersed with 20 seconds break between points and 90 seconds break during the changeover of the court. The repeated breaks during the game allows the aerobic metabolism to take place to promote recovery (Chandler, 2000). Collectively, this indicates that the aerobic fitness is essential in tennis and it should be given a fair implementation in the training program.

To researcher's knowledge, available literatures regarding the implementation of aerobic fitness training in tennis is scarce, particularly in Malaysia. Therefore, this study has been conducted to explore the implementation of aerobic fitness training among Malaysian tennis coaches in their training program.

## METHODOLOGY

Eight tennis coaches with tennis specific and sports science accreditations were involved in this study. All of them are male and their trainees including the state-level, national and international tennis players.

Respondents were recruited by using purposive sampling method (snowball). Upon verbal agreement from the respondent for the interview, the interview sessions were conducted at the pre-determined venue. Semi-structured interview was used to obtain information from the respondents. All interview sessions were recorded by using a digital voice recorder (SONY ICD-UX543F, China) for further analysis.

## RESULTS

### Demographic Information of the Coaches

As aforementioned, all respondents are qualified coaches with ITF and sports science accreditations. They are coaching players from the state-level to international players. Their mean age and total years of coaching are 39.3 ± 10.6 years and 14.9 ± 8.6 years respectively. Details of the demographic information of the coaches are presented in Table 1.

**Table 1** Demographic information of the coaches

| Coach | Age (Years) | Total Years of Coaching | Coaching Accreditation (Level) | Level of Trainee |
|---|---|---|---|---|
| **A** | 27 | 4 | ITF (1)<br>Sports Science (3) | National junior |
| **B** | 31 | 10 | ITF (2)<br>Sports Science (3) | National junior |
| **C** | 37 | 13 | ITF (2)<br>Sports Science (3) | National junior |
| **D** | 52 | 30 | ITF (3)<br>Sports Science (3) | International |
| **E** | 39 | 18 | ITF (1)<br>Sports Science (2) | National university |
| **F** | 58 | 24 | ITF (2)<br>Sports Science (2) | National junior |
| **G** | 38 | 8 | ITF (1)<br>Sports Science (1) | State |
| **H** | 32 | 12 | ITF (2)<br>Sports Science (3) | State |

## Qualitative Analysis from the Interviews

The interviews were focusing on the implementation of aerobic fitness training in the coaches' training program. Based on Table 2, five themes were emerged from the interviews which are the type of training, training period, training frequency, training duration, and training intensity. These themes led to produce the sub-theme (components of aerobic fitness training) and eventually the main theme (implementation of aerobic fitness training)

**Table 2** Themes Emerged from the Interviews

| Themes Emerged from the Interviews | Sub-theme | Main Theme |
|---|---|---|
| Type of training<br>Training period<br>Training frequency<br>Training duration<br>Training intensity | Components of Aerobic Fitness Training | Implementation of Aerobic Fitness Training |

Some quotes by the coaches regarding the implementation of aerobic fitness in their training program according to the emerged themes are described in the following topics.

### *Type of Aerobic Fitness Training Implemented*

*"Besides running, I usually conduct LSD (long slow distance) training" [Coach A]*

"*Normally, I'll ask them [players] to run on the treadmill. Besides, they will have to run around the hill" [Coach B]*

*"We would go to the track and make them run 800m, maybe 4 times, maybe for 6 times" [Coach D]*

*"Yes you can do hill running but hill running with intensity" [Coach D]*

"*Fitness training is performed without using the racket. The training has combination of running, interval training and shuttle training" [Coach E]*

*"For example, running around the court, LSD (long slow distance), and other cardio activites" [Coach F]*

*"I will ask my players to run on variety of surfaces. On the court, we will combine the running activity with technical activities to avoid boredom. Rope skipping also will be conducted" [Coach G]*

*"I encourage my players to swim" [Coach G]*

*"For aerobic training, we usually ask the players to run, non-stop. We conduct long slow distance (LSD) too" [Coach H]*

***Aerobic Fitness Training Period***

*"I may get about 8 weeks for aerobic fitness training. It may extended up to 12 weeks" [Coach A]*

*"I usually spend about 2 to 3 weeks for aerobic training but it depends on the fitness of the players" [Coach B]*

*"The aerobic fitness training usually conducted in 3 or 4 weeks" [Coach C]*

*"We conduct the aerobic training for about a month" [Coach H]*

***Aerobic Fitness Training Frequency***

*"Aerobic training is included in my weekly training plan. I'll pick one day, usually on Thursday morning, it will be fully aerobic training" [Coach A]*

*"Three sessions of aerobic training in a week, it's on Monday, Wednesday, and Friday" [Coach B]*

*"Three sessions in a week and normally during the pre-season" [Coach C]*

*"We (referring to himself & fellow coaches) conducts aerobic fitness training to maintain the players' fitness at least once in three weeks" [Coach E]*

*"Averagely 3 times a week" [Coach F]*

*"Usually, it's three times in a week" [Coach H]*

***Aerobic Fitness Training Duration***

*"Before the training begin, we will perform about 20 minutes or more for aerobic training' [Coach A]*

*"Okay, I mean...if you jog for 5km but somebody will do that in one hour. I think it's useless. I would keep it to 45 minutes" [Coach D]*

*"I usually conduct the aerobic training for about 30 minutes" [Coach F]*

*"20 to 30 minutes is adequate" [Coach G]*

*"In every training session, at least 20 minutes allocated for aerobic fitness training" [Coach H]*

*"Basically, the athlete need to complete the exercise in 20 minutes. That's it." [Coach H]*

***Aerobic Fitness Training Intensity***

*"We do everything with measurement and we want them to do at higher intensity" [Coach D]*

*"... hill running with intensity" [Coach D]*

*"In terms of intensity, it is done by controlling the exercise duration. The heart rate is not monitored, just based on exercise duration" [Coach H]*

## DISCUSSION

The general purpose of aerobic fitness training is to improve athletes' performance in endurance events (Reuter & Hagerman, 2008). Aerobic fitness training also intend to elicit aerobic metabolism at higher ratio than anaerobic metabolism (Billat, 2001) and improve the cardiovascular system to supply more oxygen to the working muscles (Collingwood, 1997). Thus, aerobic fitness training could be very important in preparing the players to play in a match that could last about 1.5 hours (Kovacs, 2006) to 5 hours (Fernandez, Mendez-Villanueva, & Pluim, 2006). Based on the analysis of the interviews, running and LSD were among the preferred type of aerobic fitness training. Both training are considered as the typical types of aerobic exercises (Reuter & Hagerman, 2008). Other aerobic fitness that conducted by the respondents like the rope skipping and swimming also fit the characteristics of aerobic fitness because those activities involve the whole body movement particularly the big muscle groups (Roetert & Ellenbecker, 2007).

Referring to LSD training, Reuter & Hagerman (2008) stated that the training can improve cardiovascular fitness, oxidative capacity mitochondrial energy production, and increase utilisation of fat to supply energy. However, the training distance should be greater than the race distance, or performed between 30 and 120 minutes (Reuter & Hagerman, 2008). However, analysis of the interviews in this study indicated that most of respondents conducted aerobic training less than 30 minutes. Thus, there is a possibility that the

duration of LSD training could be insufficient to produce the best outcomes.

In terms of aerobic fitness training period, most coaches conducted the training for about 2 to 4 weeks only. Only Coach A stated that he might get about 8 to 12 weeks to conduct aerobic fitness training. Number of weeks that aerobic fitness training could be conducted may varies due to training periodisation and/or depending on the frequency of the athletes participating in competitions.

For the duration of one month aerobic fitness training, most of the coaches conducted 3 sessions in a week for aerobic training. The training duration varies from 20 to 45 minutes. The training duration applied by the coaches is within the range of duration (20-60 minutes) as suggested by Roetert & Ellenbecker (2007). However, only one coach (Coach A) who set one specific day in a week for aerobic training and the training usually performed at least for 20 minutes. Besides, Coach E conducted aerobic fitness training once in 3 weeks but the training duration was not mentioned.

With regard to the training intensity, the imposed load should resemble the demands of the game (Fernandez et al., 2006). It can be monitored based on the heart rate responses during the training (Fernandez-Fernandez et al., 2011) or by using the scale of perceived exertion (Robertson, 2004). However, findings of this study indicated that despite many activities of aerobic exercise were conducted by the coaches, none of them mentioned the training intensity specifically. As an example, Coach H stated that:

*"In terms of intensity, it is done by controlling the exercise duration. The heart rate is not monitored, just based on exercise duration"*

## CONCLUSION

Fernandez et al. (2006) suggested that tennis is an intermittent sport with an aerobic recovery phase. There are short bouts of play of less than 10 seconds, short recovery bouts about 10-20 seconds, and longer period of play which may last up to 120 seconds (Martin & Prioux, 2011). Furthermore, the match duration is unpredictable (Konig et al., 2001). These statements describe that tennis play is not relying solely on anaerobic metabolism for energy supply to execute explosive actions. The aerobic metabolism also plays an important role during the game to help the players perform well throughout the match (Lees, 2003). Further, aerobic fitness helps in recovery during the short breaks by facilitating the regeneration of the high-energy phosphates through oxidation (Smekal et al., 2001), and assists in clearance of lactate and reduce the reliance on anaerobic glycolysis for energy production (Bergeron et al., 1991). Therefore, implementation aerobic fitness training should be given priority. Excessive training on technique and tactics may improve the athletes on those aspects. However, to assure the players to be able to perform consistently well throughout the match as well as throughout the competition, there is a necessity for the tennis players to have a specific aerobic fitness training program alongside the anaerobic-based training program. Thus, this study suggesting a specific aerobic fitness training program for tennis players to be developed to assist the coaches conducting a proper aerobic fitness training in the future.

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