
Elements of Music That Potentially Enhance the Exercise Performance and Motivation for Sedentary People

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ABSTRACT

Music in this day has become one of the important ergogenic aids for athletes and sedentary people when performing exercise and sports competition where the athletes compete in. It is believed that music helps to improve both physically and psychologically to listeners to perform better in sports. The increasing trend in using the music as an ergogenic aid while doing exercise is the result of the existing products such as portable MP3 players, smartphones and smartwatches, that can store thousands of music, and not forgetting the ergonomic design of wireless headphones and earphones that make the users feel so comfortable when wearing it. This study will extract from the previous literatures and its outcomes to gain the elements of music that affecting the exercise performance and motivation the most. Four elements of music that potentially can improve exercise performance and motivation to sedentary people will be studied at: music tempo, music type, music preference, and music intensity (volume). However, there are also several studies that the music does not enhance exercise performance and motivation, especially to the athletes. The outcome from this study will be beneficial to sedentary people when using music during exercise, providing them better performance and also the motivation. The separation of study between athletes and sedentary people when determining whether the music has the effect on performance and motivation are required because athletes might have other ergogenic aids when it comes to performance and motivation other than music such as systematic training programs, scheduled food or supplements consumption, the usage of new technologies, and others.

Keywords: *Music Elements; Exercise; Ergogenic Aids; Performance; Motivation; Sedentary.*

INTRODUCTION

Lei and Huang (2020) stated that the concept of “health first” has been a priority in people’s mindset due to improved living standard and the development of society, it seems to be contradicted in Malaysia, where it was ranked to be the highest obesity problem and had the highest obesity rate not only in South-East Asia but in whole Asia as well (Peng & Hamzah, 2017; Verma et al., 2013).

This triggered the Malaysian government to create such programs ‘My Weight My Health’, ‘10,000 Steps a Day’, ‘Mysihat’, and ‘Eat Right, Move Right: Fight Obesity to combat the obesity problem (Peng & Hamzah, 2017). At global state, it was estimated that 107.7 million children and 603.7 million adults were obese in 195 countries for the past 25 years (“Health Effects of Overweight and Obesity in 195 Countries over 25 Years,” 2017).

This study will examine music elements that may influence in enhancing exercise performance and motivation, with the goal of assisting sedentary persons in maintaining a healthy lifestyle and motivating them to do exercise.

METHOD OF THE STUDY

The major topic of this study will be described using references from respectable journals. The abstract's keywords serve as a starting point for finding relevant references. The study focuses on four music elements that have the potential to improve exercise performance and motivation for sedentary persons.

Four Elements of Music Potentially Improve on Exercise Performance and Motivation

1. Music Tempo

Music has certain emissions based on their rhythms and these emissions will stimulate the nervous cells to strengthen the feeling or motivation and at the same time can weaken the feeling or motivation too (Khazdozi, Bahari & Ashayeri, 2017). The tempo or rhythm is the speed or pace of music and indicated as beats per minute (bpm). Any tempo that has 100 beats per minute and above is considered as fast tempo while less than 100 beats per minute is considered slow tempo (Thakur & Yardi, 2013).

Karageorghis, Jones and Low (2006) described the preference of high tempo music only on high-intensity exercise, which is of 75% maximal heart rate reserve (maxHRR) because of physiological arousal, age (young adults), and positive respond to fast tempo music among people during exercise. Thakur and Yardi (2013) stated the distance and duration of exercise were much longer with fast tempo music compared to slow tempo music for normal individuals. However, there was a study indicated that slow tempo music lowering the heart rate thus it improved the endurance in performing exercise, but it did not increase physiological and psychological arousal (Copeland & Franks, 1991).

On the other hand, (Edworthy & Waring, 2006) showed the tempo of music determined the speed of running on treadmill in their research. The fast tempo of the music caused the higher speed run by the test subjects. Cardiovascular and respiratory were also significantly increased when listening to fast tempo music during steady-state exercise compared to listening to slow tempo music (Birnbbaum et al., 2009).

Chtourou, Chaouachi, Hammouda, Chamari and Souissi (2012) highlighted that warm-up while listening to high tempo music before a Wingate test in the morning can improve commonly poor morning performances and it is advisable to use high tempo music especially in the morning competitive events. Other study of music tempos on anaerobic exercise, where the participants performed Running-based Anaerobic Sprint Test (RAST) and Wingate Anaerobic Power (WAN) indicated that there were no significant differences on subjects anaerobic performance (Atan, 2013).

2. Music Type

Atan (2013) also emphasized that the type of music also had no significant effect for RAST and WAN exercise. From this study however, it showed that the subjects were only given one choice of music preference for fast and slow tempo selected from the CD of 'The Beiderbecke Connection' played by the Frank Ricotti Allstars. Pujol and Langenfeld (1999) also mentioned that there was no significant effect on the usage of music on WAN, except for submaximal performance and endurance performance because music effect was only seen as a diversion of mental from physical feeling derived from the exercise.

Another study conducted on participants using rock, dance, and inspirational music, and without music had shown that music type had no effect on heart rate (HR), ratings of perceived exertion (RPE) and exertion sensations. Somehow, 30% of participants mentioned that the music had helped them in the beginning of the run as music directed their attention and encouraged them to keep running but not after the running effort became more intense (Tenenbaum, Lidor, Lavyan, Morrow, Tonnel, Gershgoren, Meis & Johnson, 2004).

In other studies had shown that the music type had significant effect on physiological exercise performance in terms of peak anaerobic power and it could delay the onset of neuromuscular fatigue (Brohmer & Becker, 2006; Centala, Pogorel, Pummill & Malek, 2020; Eliakim, Meckel, Nemet &

Eliakim, 2007).

3. Music Intensity (Volume)

A study conducted on 75 students whose active in sports in identifying the reaction time whenever they listened to various volumes of music showed that there were no significant effect on reaction time using various volumes of music (Balkó, Waśik, Chytrý, Dunajová & Škopek, 2017). However, it may affect the mood and influence behaviour but not the performance (Van Der Zwaag, Dijksterhuis, De Waard, Mulder, Westerink & Brookhuis, 2012). There were certain factors that can be taken into consideration on reaction time, such as preparedness for the sporting event or recovery from exercise-induced fatigue and perhaps genetic factors even though it has limited impact on reaction time (Jing & Xudong, 2008).

A study on untrained young adults on exercise performance and HR had shown the exercise duration increased when using music, particularly self-selected music with a fast tempo and high volume compared to without music and as well it increased the HR (Thakare, Mehrotra, & Singh 2017). Somehow, the study was inconsistent in developing the exercise procedure, thus made the study could not identify the correlation between increase in HR and the presence or absence of music.

Another study conducted on 30 volunteers aged from 18 to 63 years on a 10-minute treadmill showed that there was a relationship between music volume and tempo in general, had an impact on performance, HR, and perhaps some other variables. Loud music was principally helpful in improving the speed of running but it did not make faster speeds (Edworthy & Waring, 2006).

4. Music Preference

Nakamura, Priscila, Pereira, Papini, Nakamura and Kokubun (2010) mentioned the HR did not change whether using preferred music, non-preferred music or without music for cycling exercise performance, but it increased when the time trials changed to much higher. They also discovered that the music no longer could influence the physiological response when the intensity of the exercise is high regardless of the type of music they listened to. Ballmann, Maynard, Lafoon, Marshall, Williams and Rogers (2019) also supported that preferred music had no effect on Wingate Anaerobic Tests (WAnTs) but increased the motivation to help to perform repeated high-intensity sprints and decreased the RPE. However, the limitation of conducted study only tested young males and untrained anaerobic sprinters.

Few studies had shown that gender differences react separately in music while performing exercise (Hallett & Lamont, 2015; Tounsi, Jaafar, Aloui, Tabka & Trabelsi 2019). Self-selected music (SSM) between two genders showed that it did not have significant anaerobic performance on both genders (Rhoads, Sosa, Rogers, Kopec & Ballmann, 2021). However, it reduced exhaustion and increased motivation compared to without music but only reflected to females. Females can use SSM as an ergogenic aid for their best possible use on their training because SSM will reduce their exhaustion and increase motivation.

Other study towards athletes on using preferred and without music on the feeling, strength, and explosive performance showed that explosive performance had improved and it was concluded in this study that the preferred music enhanced acute strength performance and as well changing the feeling state of the athletes to perform better (Biagini, Brown, Coburn, Judelson, Statler, Bottaro, Tran & Longo 2012). A study on twelve male football players on self-selected motivational music, non-preferred music and without while warming up had shown that the short-term maximal performance (STMP) and the feeling conditions improves much better when listening to self-selected motivational music compared to non-preferred and without music (Belkhir, Rekik, Chtourou & Souissi, 2019).

CONCLUSION AND RECOMMENDATIONS

Even though most research conducted shows that music has a positive effect towards performance, (Dyer & Mckune, 2013; Khazdozi et al., 2017; Rad & Hafezi, 2013) otherwise. However, Dyer and Mckune (2013) research finding was commented by Nakamura, Priscila and Missaki (2015), where it was mentioned that the music preferences and tempo were not properly determined as it is an essential

factor to ensure how it can influence the exercise performance. Khazdozi et al., (2017); Rad and Hafezi (2013) both agreed their limitations of methodology when they mentioned choosing the sample issue and the choice of music preference for the participants, respectively.

The study of music sound for instance such as the sound waves: its wavelength, amplitude, frequency, period, and velocity could probably help to determine which sound effects can improve sports performance as we notice certain sound effect might trigger the listeners to perform better. Further study relating to this area is required to understand this phenomenon.

The usage of technology such as virtual reality (VR) and augmented reality (AR) in conjunction with music in sports will have an impact on performance and motivation. The results of a comprehensive review and meta-analysis of 22 research studies published between 1997 and 2017 showed that VR-based training provides benefits in boosting physical activity and performance that much beyond those provided by standard exercise programs. VR and AR-enhanced exercise are being acknowledged as a novel way to intervene with patients in the clinical context, as well as encouraging exercise and combating noncommunicable diseases in the general public (Ng, Ma, Ho, Ip & Fu, 2019).

The language used in the music also plays important roles to determine exercise performance and motivation. This is because how one views reality is influenced by the language one uses. Linguistic relativity is linked to semiotic-level concerns about the broad relationship between language and thought, as well as discourse-level issues about how language patterns in a cultural setting might impact thought (Lucy, 2001).

Other consideration can be taken when determining whether the music can improve exercise performance and motivation is the separation between the athletes and non-athletes because apart than music itself as one of the ergogenic aids for the athletes, they also have other ergogenic aids in improving their performances and motivations such as systematic training programs, scheduled food or supplements consumption, the usage of new technologies, therapy from sport psychologists and others.

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