

DIFFERENCES MUSIC TEMPO TOWARDS GYM USERS EMOTION

Rozita Abdul Latif & Muhammad Fariez Idrus

Faculty of Sport Science and Recreation, Universiti Teknologi MARA,
Seremban Campus, Malaysia

Published online: 13 November 2020

To cite this article (APA): Abdul Latif, R., & Idrus, M. F. (2020). Differences music tempo towards gym users emotion. *Jurnal Sains Sukan & Pendidikan Jasmani*, 9(2), 1-9.
<https://doi.org/10.37134/jsspj.vol9.2.1.2020>

To link to this article: <https://doi.org/10.37134/jsspj.vol9.2.1.2020>

Abstract

Music can give influence on a lot of thing. It was known as one of the sources for entertainment. It has been classified to regulate emotion, grab attention, for lift the spirit and increased work output. Nowadays, people love listening to music believed that it entertains them and thus helps to motivate the person to continue the activity. The aim of this study was to determine the differences music tempo towards emotion among gym users in UiTM Seremban 3. Sixty participants, which were gym users that attended to the gym in UiTM Seremban 3. Subjects were randomly assigned into three different groups (n=20 in each). Group 1 fast tempo (>120 bpm), group2 slow tempo (<90 bpm) and group 3 control group that without music. The result showed that there was significant effect on different music tempo towards emotion in group 1 and group 2 as compared to group 3, Wilks's Lambda = 0.74, $F(1,57) = 19.93$, $p < 0.0005$. In terms of emotion variables, group 1 revealed the best effect for anger ($p < 0.007$), happiness ($p < 0.001$) and anxiety ($p < 0.001$) as compared to group 2 and group 3. From this study, it may help recreational athlete or exercisers to choose wisely the music selection during activity or exercise. Exercising while listening to fast tempo had positive effect on various emotion. Every sport performers or coaches can use this idea to get better training or performing activity.

Keywords: fast tempo, slow tempo, several of emotion, UiTM Seremban 3

INTRODUCTION

Regular exercise gives benefits to mental and physical health. Many gym users and exercisers use music as devices that accompany their exercise activities. Music was a main implementation for exercise nowadays because it gives positive affect and can increased the motivation (Hallett & Lamont, 2017). Music usually used in daily life because it able to manage mood and also affective some factors such as emotion, mood, exertion and fatigue especially when performing any exercise (Fritz, Halfpaap, Grahl, Kirkland & Villringer, 2013).

Music capable to reduce the stress and fatigue of the exercise (Thomas et al., 2013). It also can enhanced their enjoyment while workout or exercise and gives motivation to continue the activities (Hallett & Lamont, 2017). Music was one of the most important function that considered as regulation of emotion (Fernández-sotoz, Fernández-caballero & Latorre, 2016).

Paying attention to music as a result of it expresses emotions and regulated their own affective state (Coutinho & Scherer, 2017). Fast-tempo music was considered to sound happier than slow-tempo music, just as major and minor modes area unit happy and unhappy sounding (Jamshidzad, Maghsoudipour, Zakerian, Bakhshi & Coh, 2018).

Music preferences represent feeling for individual items or specific genres of music, that replicate basic approach or avoidance responses. In general, adult listeners offer higher liking, pleasantness, or preference ratings to happy over unhappy sounding music (Coutinho & Scherer, 2017) and to recognize emotions in music, the accessible proved that listeners conjointly expertise emotions in response to music (Fernández-sotos, Fernández-caballero & Latorre, 2016). Hence, music was probably going to induce a good vary of emotions via multiple mechanisms. Music may also elicit mixed positive and negative responding at the same time (Bird, Hall, Arnold, Karageorghis & Hussein, 2016)

From previous studies, Hallett & Lamont, (2017) stated that listening music can cause distraction to exerciser while performing tasks that need focus. In other studies, it claimed that music was an effective tool for focus and relaxation (Coutinho & Scherer, 2017). So, this study was to determine the music effect with different tempo towards emotions among gym users. Based on the problem statement, the objective of the study was to determine the different music tempo towards emotion express among gym users in UiTM Seremban 3.

LITERATURE REVIEW

Music was defined as form of audio communication, instrumental or vocal tones in continuous manner (Edworthy & Waring, 2006). Other than that, music have the ability to increase the working performance that had been reported for over 2800 years from ancient Greece, where they played harp and flute during Olympic games (Kumar et al., 2016). Music also one of the tools for relaxation and also lowering stress technique and its role in enhanced the exercise performance (Savitha, Mallikarjuna & Rao, 2014). Previous study stated that music had been widely used to accompany exerciser because it reduced muscular and mental tension (Rane & Gadkari, 2017). Recent studies claimed that music give positive effect when listening while physical activity being performed. Besides, music also known as influencer to emotion that can regulated while listening. Recent study reported that music can changed the emotion expression by regulated the physiological and psychological state (Fritz et al., 2013). Moreover, it have been identified as behaviour element for human when listening (Kumar et al., 2016).

Benefits of music in exercise

Listening to music can promoted the enjoyment during exercise also increase the interest in exercise. Music as effective tools to distract fatigue and strengthen the emotion state such as feeling vigour and reducing anger, tension and bad emotion. Recent studies claimed that music tempo have distraction effect during exercise with low intensity (Rane & Gadkari, 2017). However, previous study reported that, different music tempo will indicate with different effective depend on particular circumstance and individual (Waterhouse, Hudson & Edwards, 2010). The fast type of music promoted happiness emotion and slow type of music lead to sadness (Hallett & Lamont, 2015). Music also create emotion and change it for the listener. Several studies have investigated to compared music and no music conditions including the different tempo of the music. Thus, The tempo and beats is the main factor for rehabilitation of emotion and response from music being applied as treatment. Music promoted rhythm and tempo that can regulate movement disorders like Parkinson's disease (Thomas et al., 2013). Many findings reported that music were beneficial for enhanced motivation level and tools in sport and exercise (Waterhouse et al., 2010). Moreover, music and exercise known as synchronize element where the beats and movement get the move together. Besides, music reduce the pain during exercise depends on the listener (Hallett & Lamont, 2017).

Effects of music towards exercise

Music was for both physical health and mental. Hence, it is really effectives on emotion during physical activities that can make more healthier and increasing the enjoyment (Hallett & Lamont, 2017). Music as effective tools to distract fatigue and strengthen the emotion state such as feeling

vigour and reducing anger, tension and bad emotion. Emotion was cognitively appraised response by short duration and affected either conscious and unconscious (Wertheim, 2005). Coutinho and Scherer, (2017) stated that the process of emotion reaction through music have been state as a reason for emotion express. Emotion related to the feeling of someone behaviour in one time. We can conclude that emotion was important when doing something because it leads to what we feel. Emotion will captured all the characteristic of someone's expression (Kumar et al., 2016). Besides, emotion state was the component of physiological and psychological as well during exercise or workout (Hewston, Lane, & Karageorghis, 2008). Recent study reported that music was the tools or component that everyone used during exercise enhanced positive effect and motivation raising. Music also helpful for enhancing performance in sport. Listening to music prove that it was effective behavioural for self-mood (Hewston et al., 2008) and it also rated as a strategy to increase energy, managing stress and mood changing. In facts, many researchers revealed and agreed on effectiveness music toward emotion. Music promoted rhythm and tempo that can regulate movement disorders like Parkinson's disease (Thomas et al., 2013).

Differences of music tempo towards psychological and behaviour

Tempo was defined as pace, speed or beats of the music. It was indicated as beats per minutes (bpm) to identify it. Furthermore, tempo also have its own ability that influenced on exercise or performing physical activity (Savitha, Mallikarjuna & Rao 2014). The important of the tempo on exerciser has several reasons. First, the fast tempo music usually used for high intensity activity such as aerobic classes (Edworthy & Waring, 2006) because fast tempo typically more effective than slow tempo to induced emotion and mood. Other possibility, fast tempo music can give more arousal that may produce greater level of performance (Bird et al., 2016). Third, may be that the pace of exercise will be influenced by the pace of music (Fernández-sotos et al., 2016). All the possibilities factors were confidential for different types of tempo that caused the different effected because tempo was known as element of rhythm response that significant factor to individual's response in music. Fast tempo music seems more suitable with exercise program because it reduced sign of fatigue and created greater arousal (Thakur & Yardi, 2013). Meanwhile, for the slow tempo it reduced arousal that lead the participant in a relaxation phase (Rane & Gadkari, 2017). The slower respiratory suggested by the slow tempo thus, the faster respiratory suggested by the fast tempo music that increasing the arousal. Nowadays, music widely used as accompany for exercise and sport performance because it increases the enjoyment and emotion during exercise that make the listener feel better. Jamshidzad et al., (2018) cited that beside enhanced performance and good lifestyle, music also promoted calmness and reduce tension. Besides, music can synchronize with human brain affected by the rhythm and tempo.

Anger

Anger was considered as emotion comprised high arousal (Wertheim, 2005). Anger was relatively common emotion during the workout. Anger also may arise due to direct tension while do exercise (Fakhrhosseini, Landry, Tan, Bhattarai & Jeon, 2014). Anger was unpleasant emotion and it arise when individual feel they were not achieved goal (Tamir, Mitchell & Gross, 2011). Thus, it can be expressed toward another person by thought and intentions to harm another person (Thomas et al., 2013). Instrumental may give benefits to anger when have attaining goals (Cevasco, Kennedy & Generally 2017). Listening to music was a good method when anger because it eliminated negatives thought and feeling (Fakhrhosseini et al., 2014).

Excitement

In sport, athlete reported that excitement related to performance and often perceived it to be facilitate of performance (Jamshidzad et al., 2018). It was chosen to reflect the positive feelings by individuals. Excitement was typically considered as positive emotion that related with arousal and autonomic nervous system (Wertheim, 2005). Music can enhanced the confidence level during exercise and it had occurred when person had positive expectation of their ability to reach goals (Fritz et al., 2013).

Excitement had been labelled as good arousal emotion in performance when placed in a challenging situation (Fakhrhosseini et al., 2014). Listening to music was the effective tool to improve the ability to attaining goals (Edworthy & Waring, 2006).

Happiness

Positive emotion was associated with sport included happiness and joy (Schimmack et al., 2010). In other view, happiness referred to the low intensity feeling while joy referred to high intensity feeling (Wertheim, 2005). Music was the language of emotion and people often listened to music because it gives impact on emotion (Lie et al., 2005). Listeners revealed that fast tempo was for happiness and slow tempo was for sadness (Hunter, Schellenberg & Schimmack, 2010). Moreover, positive emotion such as happiness would had greater outcome in performing task or activity (Khalfa, Schon, Anton & Liégeois-Chauvel, 2005). Happiness also increased self-appraisal and progress to achieve goals especially when combined with joy (Moors, 2013).

Anxiety

Anxiety was considered as emotion that generated great deal with sport psychology (Frijda et al., 2013). In general, Wertheim, (2005) stated that anxiety was the most important factor on influenced sport performance. In sport, anxiety was the key construct that represented measure of emotion. In similar with anger, anxiety was found as good performance in some studies and poor performance in others (Tamir, Mitchell, & Gross, 2011). Where emotion such as anxiety was tend to form negative affect from athlete's experienced in sport (Karageorghis, 2006).

Dejection

Dejection was another feeling of depressed before competition (Fakhrhosseini et al., 2014). Although it was another affective state that influenced in sport performance. It was proposed and considered as low negative emotion by feeling deficiency and sadness (Khalfa et al., 2005). Music capable to decrease stress or pressure state while performing activity because it reduced muscle tension and less the narrow of blood vessels (Fritz et al., 2013).

METHODOLOGY

The main objective was to examine the differences music tempo towards the emotion during exercise. This study was using the causal-comparative research, which called as *ex post facto*. It is because this study was to investigate the effect of different music tempo towards emotion during exercise. This research design utilizing a questionnaire approach with a correlation design that conclude pre and post data.

Population and sampling

Population in this study were gym users in UiTM Seremban 3, Negeri Sembilan. For the sampling method, this study uses the non-probability sampling that are purposive sampling. Sixty gym users of Universiti Teknologi MARA (UiTM) had been chosen for the sampling of this study and free from any injuries. Pick sixty participants that were students of UiTM Seremban 3 that attended to the gym and workout as the subjects. The group of participants were divided into 3 groups. From the table, group 1 had been classified as fast tempo, group 2 as slow tempo and group 3 as control group. Control group was the subjects had been exercised without listening to any music. 20 individuals were divided in each group from total of 60 participants. The assumption of normal distribution from the data that had been shown was normal. By looking at Kolmogorov-Smirnov^a, the sample more than 50 so it was important to testing the normality. The data will normally distributed when the value more

than 0.05. From the result, few data show the value less than 0.05 so it can refer to the skewness and kurtosis. If the value shows in range, -2 to 2 it is normally distributed (George & Mallery, 2010).

Instrumentation

The variables measure for this study was music tempo and emotion among gym users in UiTM Seremban 3. Emotion had been measure with a single questionnaire from the Sport Emotion Questionnaire (SEQ) (Wertheim, 2005). The questionnaire contains 22 emotions characteristics that control by five factors scoring instructions which were *Anxiety, Dejection, Excitement, Anger and Happiness* ($\alpha=0.70$; Wertheim, 2005). The timer was used to set the duration of music played while did the jumping rope was fifteen minutes continuously (Kumar et al., 2016). The music had been played by using iPhone 5s and CHAMP 202 BTRM speaker system.

Data collection and procedure

Procedure in collecting had been followed. Ethical approval from UiTM Seremban 3 had been received. Then, asked permission from the gym manager who was in charged to get permission for used it. After that, gym users had been approached and explained by researcher about the study. Next, started to distribute the questionnaire to the subject and asked them to answer it. Participation in this studied were entirely voluntary. They may refuse to take part in the study or may drop out from participated in this study at any time without penalty. Researcher had explained participant about the study. This study had been run in a day for each group. First, the SEQ questionnaire had been given before exercise and subject answered it then music starting to play when the participant starts the jumping ropes. Participant had performed the jumping rope along the duration or until they feel fatigue within fifteen minutes. Lastly, the data had been collected from the gym users.

RESULTS AND FINDINGS

By looking at Kolmogorov-Smirnov^a, the sample more than 50 so it was important to testing the normality. The data will normally distributed when the value more than 0.05. From the result, few data show the value less than 0.05 so it can refer to the skewness and kurtosis. If the value shows in range, -2 to 2 it is normally distributed.

Different music tempo towards emotion express among gym users in UiTM Seremban

From the table pairwise comparison of excitement, there was significant different of music tempo towards excitement. In fast tempo with the slow tempo and compared with control group ($p<0.05$). It showed that fast tempo music with slow tempo music had different effect on excitement. Meanwhile, there was no significant effect in slow tempo with control group ($p>0.05$)

Table 1. Difference of Excitement Emotion between Groups

(I)group	(J)group	Mean difference (I-J)	Std.Error	Sig.
Fast tempo	Slow tempo	.806*	.214	.001
	Control group	.700*	.214	.006
Slow tempo	Fast tempo	-.806*	.214	.001
	Control group	-.106	.214	1.00
Control group	Fast tempo	-.700*	.214	.006
	Slow tempo	.106	.214	1.00

* Significant $p<0.05$

Table 2. Difference of Anger Emotion between Groups

(I)group	(J)group	Mean difference (I-J)	Std.Error	Sig.
Fast tempo	Slow tempo	.306	.218	.165
	Control group	.606*	.218	.007
Slow tempo	Fast tempo	.306	.218	.165
	Control group	.300	.218	.173
Control group	Fast tempo	.606*	.218	.007
	Slow tempo	.300	.218	.173

* Significant $p < 0.05$

For the anger, the result reported that there was significant effect of different music tempo towards emotion. From the table above, it showed that in fast tempo with control group had significant difference of emotion ($p < 0.05$) as compared to slow tempo ($p > 0.05$). It concluded that, fast tempo showed the best effect compared with slow tempo music towards anger.

Table 3. Difference of Happiness Emotion between Groups

(I)group	(J)group	Mean difference (I-J)	Std.Error	Sig.
Fast tempo	Slow tempo	.794*	.198	.000
	Control group	.719*	.198	.001
Slow tempo	Fast tempo	-.794*	.198	.000
	Control group	-.075	.198	.706
Control group	Fast tempo	-.719*	.198	.001
	Slow tempo	.075	.198	.706

* Significant $p < 0.05$

From the table 3, there was significant effect on happiness of different music tempo. In fast tempo with slow tempo, there was significantly different effect the p -value < 0.001 similar with control group the p -value < 0.001 . Meanwhile, there were no significant effect of different in slow tempo with control group the p -value < 0.706 .

Table 4. Difference of Dejection Emotion between Groups

(I)group	(J)group	Mean difference (I-J)	Std.Error	Sig.
Fast tempo	Slow tempo	-.280	.197	.161
	Control group	-.190	.197	.340
Slow tempo	Fast tempo	.280	.197	.161
	Control group	.090	.197	.650
Control group	Fast tempo	.190	.197	.340
	Slow tempo	-.090	.197	.650

* Significant $p < 0.05$

For dejection, there was no significant effect of different music tempo towards dejection. In fast tempo with slow tempo the p -value < 0.161 compared with control group the p -value < 0.340 . Meanwhile, in control group with slow tempo the p -value < 0.650 . It showed that there was no significant effect of different music tempo.

Table 5. Difference of Anxiety Emotion between Groups

(I)group	(J)group	Mean difference (I-J)	Std.Error	Sig.
Fast tempo	Slow tempo	-.080	.210	.705
	Control group	.050	.210	.813
Slow tempo	Fast tempo	.080	.210	.705
	Control group	.130	.210	.539
Control group	Fast tempo	-.050	.210	.813
	Slow tempo	-.130	.210	.539

* Significant $p < 0.05$

From the table above, it showed that there was no significant effect of different music tempo towards anxiety. The p -value < 0.705 was reported from fast tempo with slow tempo music compared with control group the p -value < 0.813 . Meanwhile, in slow tempo with control group also showed no significant effect the p -value < 0.539 .

DISCUSSION AND CONCLUSION

Music was an element to various ongoing therapy has been reported nowadays. Music also useful to reduce anxiety and pain for patient (Kumar et al., 2016). In the present study, I found that fast music tempo effective on reduced anger and improved happiness and excitement. Nevertheless, for anxiety and dejection there were no effect between tempos had been reported. Previous study had also reported the same effect whereas the fast tempo giving positive effect on exercise performance (Thakur & Yardi, 2013). Studies also reported that exercise while listening music giving result that same with previous research (Savitha, Mallikarjuna & Rao, 2014). The other studies showed that exercise with music reported effect than no music on several variables of emotion. The other studies was reported that music was affective for controlling emotion and motivational psychological during exercise in prolonged time (Waterhouse et al., 2010).

The result confirmed that subject's emotion changed exposed while listening to the slow tempo with fast tempo than without music. In addition, it was seen that greater effect during listening to the music after exercise was more with fast tempo than slow tempo. Various emotions could lead to effectiveness while listening during exercise or workout with music. Listening music can cause distraction while performing task (Hallett & Lamont, 2015). Previous studies showed that music can control emotional and physiological arousal (Karageorghis, 2006) and effective tools for focus, relax and block out distraction (Coutinho & Scherer, 2017). Also, music is knows as helping the subject immerse and completely focus on the activity (Thakur & Yardi, 2013) which probably helps to overcome sign of fatigue or discomfort and can sustain to continue the exercise. In this study, the different music tempo gives the different effect on various emotion. However, in terms of various emotion, dejection and anxiety were not showed the different between all three groups. It means that listening to music and without music did not give any changes during exercise or workout. Fast tempo and slow music showed the greater effect towards anger, excitement and happiness than no music. This was also reflected that music had ability to manipulate various emotion and effort sense despite increased work.

In highlighted, which of the types that are slow tempo or fast tempo had more effective on exercise performance. The result revealed that both the types of music gives effect on various emotion during exercise, however the greater effect was more with fast tempo. Thus, fast music showed more suitable for this exercise program. It reflected that fast tempo and strong rhythm can producing positives feeling during exercise (Edworthy et al., 2017). In this study, fast tempo had showed the greater effect than slow tempo and no music because it may reducing arousal and also decreased the sign of fatigue (Waterhouse et al., 2010). Moreover, fast tempo music condition may lead to reduce the sense of anatomy during exercise task. Nevertheless, slow tempo music reported that it also gives the effect than no music during exercise. Thus, slow tempo music working on certain exercise program like exercise that needed focus and relax. Other studies found that slow tempo music was one

of the best tools for physical and psychological exertion (Savitha, Mallikarjuna & Rao 2014). In general, results of this study revealed that both fast and slow tempo music have positive effect on several of emotion. However, the fast music tempo showed the greatest positive effect towards emotion during exercise than slow tempo.

Most of the studies on the effect of fast tempo music, slow tempo music and no music have reported fast tempo music was the better in terms of various emotion during exercise. From the present study we can conclude that fast music tempo compared to slow music tempo and no music was the better tools or suitable to control various emotion during exercise. For the variation of emotion such as anger, happiness and excitement, the result showed that fast tempo music better effect than slow tempo and no music. However, in terms of anxiety and dejection, we could not find any significant effect from fast tempo and slow tempo music. This study leaves some unanswered question as to why there were no significant effect towards anxiety and dejection between fast tempo, slow tempo and no music, even though it improved emotion expression during exercise on happiness, excitement and decreased anger.

Overall, the present study revealed more knowledge and information about differences music tempo towards emotion among gym users. However, few things need to be added in the future study. Some variables can be added into this study to be clearer and understanding about this study. In future, researchers are recommended to include other factor such as music with lyric and non-lyric music as the independent variable towards emotion among gym user or recreational athlete as the dependent variable. This was to investigate the differences between the independent variable and dependent variable.

Acknowledgments

The authors declare no conflict of interest. The study was been approved by ethic committee (FSR/1/2019).

Funding

The authors received no financial support for the research, authorship, or publication of this article.

Ethics approval

The study protocol was approved by the UiTM Ethical Board.

REFERENCES

- Bird, J. M., Hall, J., Arnold, R., Karageorghis, C. I., & Hussein, A. (2016). Effects of music and music-video on core affect during exercise at the lactate threshold. *Psychology of Music*, 44(6), 1471–1487. <https://doi.org/10.1177/0305735616637909>
- Cevasco, A. M., Kennedy, R., & Generally, N. R. (2005). Comparison of movement-to-music, rhythm activities, and competitive games on depression, stress, anxiety, and anger of females in substance abuse rehabilitation. *Journal of Music Therapy*, 42(1), 64–80.
- Coutinho, E., & Scherer, K. R. (2017). The effect of context and audio-visual modality on emotions elicited by a musical performance. *Psychology of Music*, 45(4), 550–569. <https://doi.org/10.1177/0305735616670496>
- Edworthy, J., & Waring, H. (2006). The effects of music tempo and loudness level on treadmill exercise. *Ergonomics*, 49(15), 1597–1610.
- Fakhrhosseini, S. M., Landry, S., Tan, Y. Y., Bhattarai, S., & Jeon, M. (2014, September). If you're angry, turn the music on: Music can mitigate anger effects on driving performance. In *Proceedings of the 6th International Conference on Automotive User Interfaces and Interactive Vehicular Applications* (pp. 1–7).
- Fernández-Sotos, A., Fernández-Caballero, A., & Latorre, J. M. (2016). Influence of tempo and rhythmic unit in musical emotion regulation. *Frontiers in Computational Neuroscience*, 10, 80.
- Fritz, T. H., Halfpaap, J., Grahl, S., Kirkland, A., & Villringer, A. (2013). Musical feedback during exercise machine workout enhances mood. *Frontiers in Psychology*, 4(DEC), 1–7. <https://doi.org/10.3389/fpsyg.2013.00921>
- Hallett, R., & Lamont, A. (2015). How do gym members engage with music during exercise? *Qualitative Research in Sport, Exercise and Health*, 7(3), 411–427. <https://doi.org/10.1080/2159676X.2014.949835>
- Hallett, R., & Lamont, A. (2017). Music Use in Exercise: A Questionnaire Study. *Media Psychology*, 20(4), 658–684. <https://doi.org/10.1080/15213269.2016.1247716>
- Hewston, R. M., Lane, A. M., & Karageorghis, C. I. (2008). Development and initial validation of the music mood-regulation scale (MMRS). *European Journal of Applied Physiology*, 4, 15–22.
- Hunter, P. G., Schellenberg, E. G., & Schimmack, U. (2010). Feelings and perceptions of happiness and sadness induced by music: Similarities, differences, and mixed emotions. *Psychology of Aesthetics, Creativity, and the Arts*, 4(1), 47.

- Jamshidzad, M., Maghsoudipour, M., Zakerian, S. A., Bakhshi, E., & Coh, P. (2018). Impact of music type on motor coordination task performance among the introverted and extroverted students. *International Journal of Occupational Safety and Ergonomics*, 0(0), 1–19. <https://doi.org/10.1080/10803548.2018.1455410>
- Karageorghis, C. I., Jones, L., & Low, D. C. (2006). Relationship between exercise heart rate and music tempo preference. *Research Quarterly for Exercise and Sport*, 77(2), 240-250.
- Kumar, K., & K, P. P. D. S. (2016). Effect of music during exercise on rate of perceived exertion & mood status. *International Journal of Medical Research and Review*, 4(9), 1706–1712.
- Moors, A., Ellsworth, P. C., Scherer, K. R., & Frijda, N. H. (2013). Appraisal theories of emotion: State of the art and future development. *Emotion Review*, 5(2), 119-124.
- Rane, P. R., & Gadkari, J. V. (2017). The effect of slow and fast musical tempo on post-exercise recovery on recovery period in young adults. *National Journal of Physiology, Pharmacy and Pharmacology*, 7(1), 22.
- Savitha, D., Mallikarjuna, R. N., & Rao, C. (2010). Effect of different musical tempo on post-exercise recovery in young adults. *Indian Journal of Physiology and Pharmacology*, 54(1), 32-36.
- Khalfa, S., Schon, D., Anton, J. L., & Liégeois-Chauvel, C. (2005). Brain regions involved in the recognition of happiness and sadness in music. *Neuroreport*, 16(18), 1981-1984.
- Tamir, M., Mitchell, C., & Gross, J. J. (2008). Hedonic and instrumental motives in anger regulation. *Psychological Science*, 19(4), 324-328.
- Thakur, A. M., & Yardi, S. S. (2013). Effect of different types of music on exercise performance in normal individuals. *Indian Journal of Physiology and Pharmacology*, 57(4), 448–451.
- Waterhouse, J., Hudson, P., & Edwards, B. (2010). Effects of music tempo upon submaximal cycling performance. *Scandinavian Journal of Medicine & Science in Sports*, 20(4), 662-669.
- Wertheim, L. J. (2005). Sport Psychology. *Tennis*, 41(9), 88. <https://doi.org/10.1146/annurev.ps.35.020184.003133>

✉ Rozita Abdul Latif
 Faculty of Sport Science and Recreation,
 Universiti Teknologi MARA, Seremban Campus,
 Malaysia
 Email: rozita.abdlatif@uitm.edu.my