



Contents lists available at BioMedSciDirect Publications

International Journal of Biological & Medical Research

Journal homepage: www.biomedscidirect.com

Original Article

Effect of Fast Tempo Songs on Heart Rate of Young Adults

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ARTICLE INFO

Keywords:

Fast tempo
Slow tempo
Song
HR
Music

ABSTRACT

Earlier studies show listening music has effect on heart rate however, the rationale of the present study was to find whether the different kind of tempo songs have affect on heart rate (HR). For these study normal, healthy medical students 19-21 years, both sexes were selected (N30). In four different stages their HR, was measured 1) Baseline (without any stimulus) 2) before exercise (songs played) 2) after 5-6 min exercise using Bi-cycle Ergo meter (no song played) 4) after exercise, slow tempo 60-70 beats/ min, medium 80-90 beats/ min and fast tempo 120-160 beats / min songs were played (2.5-3 min) with a resting period of 30 min between one tempo to another tempo song. The result shows that the fast tempo songs significantly ($P < 0.005$) increases the HR, when compare to other tempo songs it indicate that fast tempo song has effect on HR

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Introduction

Music is the big part of human life. It's competent of numerous health benefits including lowering stress levels, raising states of consciousness and changing moods. Numerous studies reported that music has favorable physiological effect on human especially during stress, anxiety and depression [1, 2]. Listening music that imitate or improves their emotional state [3, 4], manipulate emotions [5] decreasing HR, and blood pressure (BP), and pain reduction [6]. However; it's mainly based on the fast or slow tempo of music, extreme music leads to emotions, anger and aggression [7] tension [8] leads stress. Most of the earlier studies showed that music has positive effect but only limited study shows the negative effect of music [9] hence, this study has been undertaken. The purpose of the present study is to assess whether the different music tempo has direct effect on increasing HR in normal adults.

Materials and Methods

All methods were carried out in accordance with the approved guidelines from the VMKV medical university institutional ethical board. Normal healthy young adults, both sex, age between [19- 22 years] normal BMI (N30). Each subject signed informed consent was obtained.

Song selection and analysis

An analysis of the 500 different language songs, we finalized based on participant like and dislike or anger creating songs from that slow tempo 60-70 beats/ min, medium 80-90 beats/ min and fast tempo 120-160 beats / min songs were selected. Each Song was analyzed beats per min (BPM) by Piston soft BPM detector (online)

Methods

The selected subjects were in four different stages their HR, was measured 1) Initially baseline (normal room temperature, without any stimulus) 2) before exercise (songs played) 3) after 5-6 min exercise using Bi-cycle Ergo meter (no song played) 4) after exercise. slow tempo 60-70 beats/ min, medium 80-90 beats/ min and fast tempo 120-160 beats / min songs were played (2.5-3 min) with a resting period of 30 min between one tempo to another tempo song. The songs were delivered through the head phone and sound intensity was adjusted according to the subject's tolerance. For HR measurement computerized Electrocardiogram (ECG) was used and R-R interval calculated.

HR Measurement

Computerized ECG recorder (CARDIOART 8408 VIEW, India) was used. Based on experimental procedure each group subjects were allowed to record continuous ECG for 4-5 min automatically, it shows the mean HR /min

Moderate exercise

After baseline measurements subjects were asked to do moderate exercise using Bi-cycle Ergo meter (INCO, India) for 5 min (distance covered / unit time is constant) after that very small break 2-3 min rest and the subjects HR was measured

Statistical analysis

Descriptive data are expressed as mean \pm standard deviation (SD). One-way ANOVA was used to analyze the data. The level of significance was $P < 0.05$. All data were analyzed using SPSS for Windows version 17.0 (SPSS Inc., Chicago, IL, USA).

Result

We evaluated heart function from HR. The data were collected from 30 healthy subjects. The effect of different tempo songs on

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heart function was analyzed in normal condition (before exercise) (Table 1.) show the mean and standard deviation (SD) of HR. For comparison study one way ANOVA was used, our result shows that fast tempo songs has significantly ($P < 0.01$) increase the HR. when compare to baseline (no song played) and slow or medium tempo songs (Table 2.).

Table 1. Effect of different tempo songs on HR in normal condition (Before exercise)

	Baseline Mean \pm SD	Before exercise (Song played) Mean \pm SD		
	no song played	Slow tempo	Medium tempo	Fast tempo
Heart rate (HR)	71.60 \pm 4.174	67.60 \pm 2.313	73.40 \pm 7.093	80.87 \pm 4.754

Note: Mean of normal healthy subjects (N30)

Table 2. Comparison of different tempo songs on HR in normal condition (Before exercise)

Multiple comparison	Heart rate HR	
	Mean difference	P value
Base line vs Fast tempo song	-9.267	$P < 0.001$
Slow tempo vs Fast tempo song	-13.27	$P < 0.001$
Base line vs Medium tempo song	-1.800	$P > 0.05$

Note: P value significant $P < 0.001$, (N30)

Table 3. Effect of different tempo songs on HR after exercise

	Baseline Mean \pm SD	After exercise (no song played) Mean \pm SD	After exercise (song played) Mean \pm SD		
	no song played	no song played	Slow tempo	Medium tempo	Fast tempo
Heart rate (HR)	71.60 \pm 4.174	103.1 \pm 12.78	97.93 \pm 12.88	105.4 \pm 12.41	113.4 \pm 9.775

Note: Mean of normal healthy subjects (N30)

Table 4. Comparison of different tempo songs on HR after exercise

Multiple comparison	Heart rate HR	
	Mean difference	P value
After exercise (no song) vs Fast tempo song	-10.33	$P < 0.01$
After exercise Slow tempo vs Fast tempo song	-15.47	$P < 0.001$
After exercise (no song) vs Medium tempo song	-2.300	$P > 0.05$

Note: P value significant $P < 0.05$ and $P < 0.001$ (N30)

Further, to confirm the fast tempo songs effect on heart function, we analyzed the effect of different tempo songs on after exercise, our result shows that even after exercise the fast tempo songs has significantly ($P < 0.05$) increases the HR, when compare to base line or after exercise (no song played) or other tempo songs played (Table 3 and 4)

Discussion

The aim of the study is to find the negative effect music hearing, our study result shows that fast tempo songs before and after exercise significantly increases the HR. It indicates fast tempo song has negative effect on heart function, our result consistent with the previous study report rap music, linked with fast tempo music, causes increasing HR [10], extreme music causes anger and promotes aggressive behavior [11, 12, 13]. Recent studies also shows that extreme music leads to anger, such as aggression [9] and stress it could increase the sympathetic tone due to activation of HPA [14, 15] which may increase the HR, [16, 17]. Earlier studies hypothesized that there would be a significant effect of different tempo music on sympathetic nervous system level of activation [18]. Our findings support the earlier concept

Conclusion

The current study conclude that fast tempo music increase the activity of HR it may due to anger, aggression and stress via increase sympathetic tone. However, further research is required to replicate these findings and long term effects of fast tempo songs.

Acknowledgments

This study was financially supported by Vinayaka Missions University (VMU). Hereby, the author would like thanks to the young medical students who were involved in this study and to Dr .H.S. Gulapalli, HOD, Department of physiology for kind support and Mrs. Bama for technical support Vinayaka Mission Medical College and Research Institute, Karikal, India

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