

# EFFECT OF CLASSICAL MUSIC ON THE CARDIOVASCULAR SYSTEM

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## Abstract

This literature review is important because it provides for an additional treatment plan for people that are recuperating from cardiovascular related diseases in the hospital. Previous studies have shown that classical music impacts heart rate and blood pressure. These studies also lack a contrast with other genres of music and if they do, they do not list what kind of music it is. Classical music affects cardiovascular health by reducing the effects of stress such as high blood pressure and heart rate. This is a literature review, meaning that we have done thorough research regarding our topic to achieve a conclusion. The studies that were used are from the years 2008 to 2022. These studies took place primarily in America, specifically in Illinois and Ohio. While carefully analyzing and reviewing the studies we looked for specific information that would be able to aid us in our research. Classical music is able to affect heart rate and blood pressure. When surveyed, participants stated that despite the increase or decrease in heart rate, they both had a great decrease in stress. After analyzing studies done by Darki and his colleagues as well as a study done by Schuefele, it was found that when subjecting people to a piece of classical music or slow music after being put into a stressful environment, the subject's heart rate and blood pressure was found to decrease in turn reducing the effects of stress. This literature analysis is aimed towards raising awareness on how to take preventative measures towards the leading cause of death in America, also known as cardiovascular disease.

## Introduction

Classical music, originating in Italy during the early 1600s, primarily catered to aristocratic society during the Renaissance (Darity, 2008). This genre, characterized by instrumental compositions, including strings, piano, woodwinds, and brass instruments (Carr et al., 2023), eventually gained popularity across Europe and the Western world. In the United States, music therapy has a long history, initially used to aid veterans of WWI and WWII in hospitals (Darity, 2008). Music therapy, particularly employing classical music, helps regulate emotions and reduce stress by influencing the cardiovascular system. Slow classical music has been found to induce relaxation, lowering blood pressure, and mitigating the body's stress response (Darki et al., 2022). This literature review is significant because through the analyzation of previous experiments and studies done, classical music therapy has the potential to be used as an immediate response to decreasing the effects of stress on the cardiovascular system.

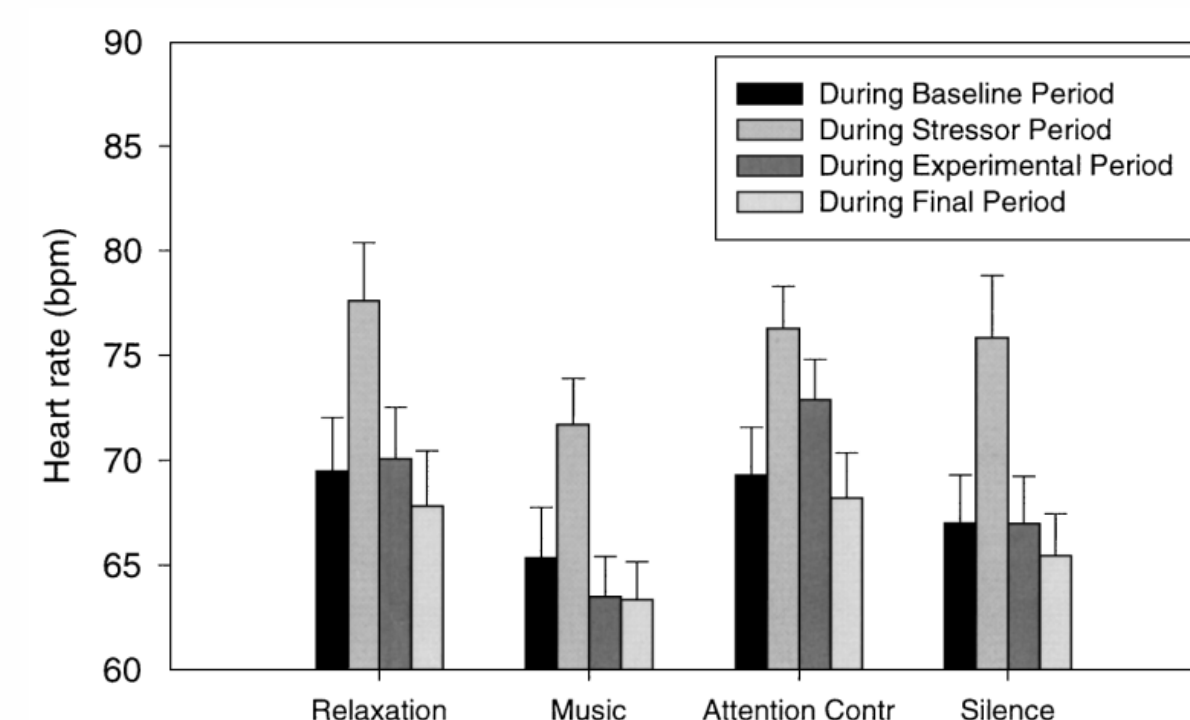
## Materials & Methods

This is a literature review, meaning that we have done thorough research regarding our topic to achieve a conclusion. These key terms were imputed into the following search engines, Google Scholar, ProQuest, and EBSCOHost: "classical music history", "cardiovascular health", "blood" "pressure", "heart rate", "classical music and cardiovascular health", and "music therapy". The studies we used were from the years 2008 to 2022. These studies took place primarily in America, specifically in Illinois and Ohio. While carefully analyzing and reviewing the studies we looked for specific information that would be able to aid us in our research. This included looking for mentions of "the correlation between classical music and cardiovascular health", "why classical music is used as a stress reliever", and "how classical music affects health patients." The studies used provided us with information as to how the body reacts to classical music and how it could be useful to combat stress (which is the main factor of an increased blood pressure and heart rate). The information provided gave us insight to help solve people's issues with stress and other cardiovascular issues. Therapy using classical music has the potential to be utilized in hospital settings which in turn could help patients recover quickly and improve their cardiovascular health.

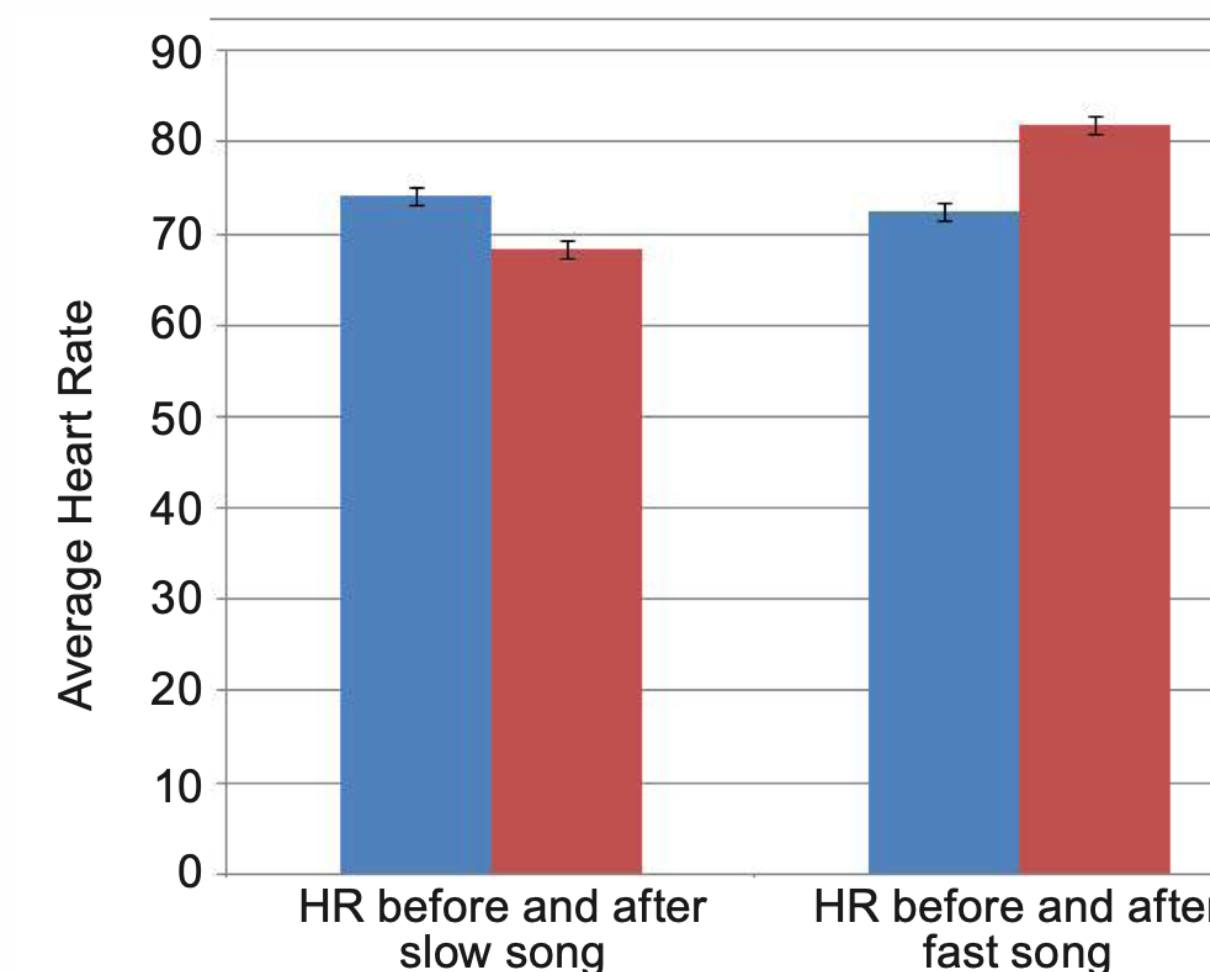
## Results

	Resting	Fast Music	Slow Music	P-Value
Heart Rate (BPM)	75.7 +/- 11.6	83.0 +/- 11.9	72.6 +/- 11.3	<0.05
Systolic Blood Pressure (mmHg)	116.0 +/- 10.9	122.1 +/- 13.9	110.5 +/- 9.7	<0.05
Diastolic Blood Pressure (mmHg)	73.2 +/- 10.1	79.7 +/- 11.2	70.7 +/- 9.8	<0.05

**Figure 1.** The difference in blood pressure and heart rate when listening to fast classical music compared with slow classical music is statistically significant (Darki et al., 2022). The p value for each is less than 0.05 which means that the null hypothesis is accepted and that there is a correlation between classical music and the cardiovascular system.



**Figure 2.** The heart rate of the different experimental groups were measured during the baseline, stressor, experimental, and final periods. Each of the groups were all asked to complete a task and were later exposed to a form of stressors (Scheufele, 2000). All of the groups' heart rates skyrocketed during the stressor period, but was brought back down as soon as the experimentation period began. The music group presented a lower heart rate at the baseline period and dropped significantly lower than all the other groups during the final period.



**Figure 3.** The data compares the average between the heart rate before and after listening to slow and fast tempoed songs (Agarawl et al., 2013). The heart rate before the fast song ranged between 54-94 beats per minute with an average of  $72.5 \pm 10.2$ . After listening to the fast song for 2.5 minutes, the heart rate of the subjects ranged between 62-110 beats per minute with an average of  $81.9 \pm 12$ . The blue bars represent the average heart rate before listening to a song; the red bars represent the average heart rate after listening to the songs. Error bars represent standard deviation.

## Discussion & Conclusion

By observing Figure 1, it is evident that classical music affects the cardiovascular system, specifically the heart rate. With the given data, we are able to conclude that when one is excited or anxious, a song with a slower tempo has the ability to calm them by decreasing their heart rate. We also observed that a faster paced song increases the heart rate. However, both are beneficial because of how they affect the person as a whole, including their cardiovascular system. Listening to this type of music is able to make people feel less stressed which in turn benefits their cardiovascular health (Darki et al., 2022).

In Figure 2, the results show that the music group's heart rate lowered after listening to classical music (Scheufele, 2000). In the study, both the first and second movements of Mozart's Sonata in D Major for Two Pianos were played after the stressor was induced. The group listened to the music for 15 minutes. While the music group reported that the music was distracting when they were completing the task, their heart rates were the lowest out of the attention control (who listened to an auditory memory task), progressive relaxation, silence, and the control groups. Even though the focus measured for the music group was not high, the data still shows that music is a great distraction for induced stress and thus reduces stress in individuals. It can serve as a good form of stress management and could be beneficial for the cardiovascular system.

Looking at Figure 3, it is observed through the comparison of subjects before and after listening to a slow and relaxing tempoed song for 2.5 minutes (Agarawl et al., 2013) as well as a song with a faster bpm for the same amount of time. Out of the 30 subjects which participated in the experiment, 28 experienced a decrease, when listening to the slower piece, or an increase, when listening to a faster piece, in heart rate. The study concluded that the heart essentially follows the bpm of the song the subject is listening to which results in not only a decrease in heart rate, but lowered blood pressure when the slow song uses "relaxing" musical components such as sound, these factors create a calming effect on the subject (Agrawal et al., 2013).

High levels of stress have been known to make people more susceptible to heart disease therefore by listening to classical music, one is able to reduce their chances of heart disease through reducing stress. In the future, we could have tested this out with real subjects and replicate the experiment with the same instruments.

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