MUSIC AND HEALTH

PSYCHOLOGY, TECHNOLOGY, AND SOCIETY

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Abstract

Music is a crucial element of everyday life and plays a central role in all human cultures. It is listened to and played by people of all ages, races, and ethnic backgrounds. But music is not simply entertainment. Scientific research has shown that it can influence physiological processes that enhance physical and mental wellbeing. A sense of wellbeing is undoubtedly something that is desired by most human beings. Music in its various forms is used as a means of communication on health and health-related issues. In this term paper, we will first summarize the positive impacts of music on humans. Next, we will highlight how music can have negative impacts too on health. We further tested these theories using some experiments.

Keywords: Health, Music, Physical impacts, Psychological impacts, Music interventions in healthcare, Music therapy

Introduction

Music is the scientific combination of mathematics, physics, and arts. It has a universal language. Its language is like the sound of winds or rains or flowing water or waves of the seas and oceans. It is the same everywhere. Music can cause many effects in the human mind as well as nature. Music can control the emotional state of a human. It can cause a person to smile or cry, and they become frightened listening to music or become relaxed. The sound of a newborn baby's cry is music that gives happiness to parents and relatives. After the first cry, its contracted lung alveoli

open up, and it can breathe again. The cry is universal. It is the same for rich or poor, black or white. So crying is universal music that can create emotional changes in others' minds.

Music has served to express human emotions such as joy, sorrow and has done so very effectively. Listening to music, singing, creating, playing, whether individually and collectively, are everyday activities for most people. Music can be represented as an enjoyable activity, but its influence goes beyond simple amusement. Music is one of the fundamental attributes of the human species. It can have multiple positive effects on the body and soul. Music has offered ways of understanding and developing our self-identity, connecting us with important life events and people, experiencing and expressing spirituality, and enhancing cognitive and physical functioning, and also contributing to improved quality of life, self-esteem, sense of competence and independence, and counteracting isolation and loneliness.

2. Positive Impacts of Music on Health

2.1 Physical Impacts of Music

"Music can cure the wounds that medicine cannot." Some of the areas of physical health where music plays an important part are as follows :

2.1.1 Music can reduce the risk of cardiovascular disease

Cardiovascular diseases like heart attack are the most deadly diseases occurring among all age groups. Music therapy greatly reduces the chances of a heart attack. Listening to your favorite music leads to the production of endorphins in the brain, improving vascular health. Listening to music is good for blood vessels since it leads to nitric oxide production, which dilates blood vessels, hence improving blood circulation. Music also lowers high blood pressure.

2.1.2 Music improves the sleeping habit

Sleeping habits are one of the most important concerns regarding human health. We often see that lullabies help babies fall asleep. Music lowers the levels of cortisol which makes individuals feel stress-free, which leads to good sleep. Studies show that music triggers the release of "dopamine," mainly released during pleasurable activities. The release of dopamine boosts good feelings and addresses pain while at bedtime, leading to a sound sleep.

2.1.3 Music reduces fatigue and boosts performance

Fatigue means "overtiredness" or "a lack of energy to do something." Some tasks require an enormous amount of neuromuscular training. More training means faster a person feels tired more quickly. Listening to music helps in delaying fatigue and lessens the subjective perception of fatigue. Less fatigue means more increase in performance. Music activates a region of the brain called the "left inferior frontal gyrus," which is responsible for making us feel less tired.

2.1.4 Music and immune system and music therapy in cancer treatment :

The immune system is an important part of the human body. It provides resistance to deadly infections. Recent studies showed that those people who had a good immune system were able to recover much faster from COVID-19. Besides some good habits like eating healthy foods and doing exercise regularly, music also plays a very important role in improving the immune system. Music releases endorphins in the body, which act as natural analgesics. Music increases platelet production, stimulates lymphocytes and cell protection against various diseases. Music decreases the response time of the immune system by lowering cortisol levels. Music also increases the production of antibodies and natural killer cells. Music therapy is also used in the treatment of cancer.

2.2 Psychological Impacts of Music

Listening to music is entertaining, and some research suggests that it might indeed make you healthier. Music is a source of pleasure and enjoyment, but there are numerous psychological benefits of music. The psychological effects of music can be significant and broad-ranging. Some of them are as follows.

2.2.1 Elevates Mood and Motivation

Music affects our mood a lot. Our mood changes according to the type of music we are listening to. If we had a bad day, joyful songs could lift our mood immediately. The bright musical tunes and lyrics change or elevate your mood and empower you for the day ahead. If you are having a lazy morning, or you need to get through a long day of the week, or you have no motivation, Up-tempo, fast-paced music gets your body and brain moving, making you excited and motivated to enjoy what's ahead. There's a good reason why we find it easier to exercise while listening to music because listening to fast-paced music inspires you to work harder.

2.2.2 Reduce anxiety and depression

Music helps to reduce anxious and depressive thoughts. Music Therapy has become popular in treating anxiety and depression. It's an exercise in which therapeutic music is composed to promote physical and mental rehabilitation. Researchers have found that music therapy can be a safe and effective treatment for various disorders, including depression. One study also found that music therapy was a safe, low-risk way to reduce depression and anxiety in patients suffering from neurological conditions such as dementia, stroke, and Parkinson's disease. A recent study by Dr. David Lewis-Hodgson of MindLab International has shown that instrumental, classical, or ambient music can help reduce anxiety by up to 65%.

2.2.3 Reduce Stress

Music is a stress reliever. Whether playing in the background or you're giving it your full attention, specific genres of music have the ingrain capability to reduce stress. Soft, ambient, slow music provides calming stimulation for the mind.

2.2.4 Improve Focus

One of the numerous excellent benefits of music is that it can be listened to while performing your everyday activities. Focussing and concentrating on an activity like studying, working, or cleaning can be difficult for some people. In such situations, music can help increase focus. Certain types of music are known to boost focus, so it's essential to know which music is suitable for improving focus.

3. Negative Impacts of Music on Health

3.1 Music can trigger bad memories

Most adolescents listen to music that is experienced as sad music, and they may trigger sad feelings or bad memories. Certain songs or specific musical patterns can trigger the memory of negative situations we lived in the past and would rather leave behind forever.

To overcome this disadvantage, we can seek some psychological support, especially if we are dealing with stress disorders, anxiety, or other mental health issues.

3.2 Music can be distracting

It is true that music can help us concentrate, but only when specific conditions are met.

Listening to music during working hours may experience mild memory loss issues or just worse results than expected. Also, we may end up focusing on the words sung by our favorite artist instead of the book.

To overcome this disadvantage, we should listen to the right type of music or claim some periods of silence for ourselves, especially whenever we are engaging in a difficult or demanding task.

3.3 Making Bad Decisions

Listening to party music while making decisions increases the likelihood of making risky decisions. As music is a very common feature of young adults, listening to party music increases risky decisions to drink alcohol and eat food. Also, party music increases risky decisions about alcohol more than food decisions.

3.4 Some people can’t stand music

As some people may be too sensitive to loud sounds, and hence not everyone likes music. Some people may even experience anxiety responses when presented with specific genres of music due to their loudness, dynamics, or overall mood.

To overcome this disadvantage, we can listen to music at low volume or may enjoy different activities, such as reading or doing sports

3.5 Hearing loss

Listening to music at a high volume for long periods of time, without protecting our ears, we will likely experience hearing loss issues. The over-exposure to noise may also lead to high-pitched sound known as tinnitus. Hearing damage can also occur within minutes of exposure to this level of a high volume of the music.

To overcome this disadvantage, Avoid listening to loud music with your earphones or headphones for a long time. Take some sensible breaks or keep the volume down. While playing loud instruments such as drums, wearing earplugs can also help to overcome this advantage.

4. Experiments

4.1 Introduction

There is rapidly emerging interest in music interventions in healthcare. Music interventions are widely applicable, inexpensive, without side effects, and easy to use. On April 22nd 2017,

Department of Neuroscience, Erasmus University Medical Center, Rotterdam, Netherlands performed an experiment dedicated to the effects of music on rodents.

4.2 Search Strategy

On April 22nd, 2017, a systematic literature search was performed in the electronic databases EMBASE, Medline(ovidSP), Web-Of-Science, PsycINFO, Cinahl, PubMed publisher, Cochrane, and Google scholar for publications that would be relevant to answer the research question.

4.3 Procedure

Studies meeting the following criteria were considered for inclusion:

(1) experimental study performed in rats or mice;

(2) investigating the effect of music interventions on neuronal processes, behavioral effects, endocrine and/or inflammatory responses, or physiological conditions;

(3) comparing the effect of a music intervention with a comparator situation without music, referred to as “control;”

(4) available full-text article;

(5) written in English;

(6) published after 1/1/1960.

There weren’t any limitations to the type of music administered. The music had to contain melody, harmony, and rhythm. There weren't any types of control conditions.

4.4 Data Analysis

The following study characteristics were collected in an Excel spreadsheet:

1) authors

2) year of publication

3) animal model characteristics (species, sex, age, number of animals, disease induced characteristics)

4) music intervention (type, timing, duration, loudness)

5) specific description of the music and genre

6)control condition (type, timing, duration, loudness)

7)perform tests.

4.5 Results

Twenty-three studies investigated the effects of music on the neuro-anatomy of the brain, such as neurogenesis and neuroplasticity as measured by precursor cell proliferation by bromodeoxyuridine (BrdU) labeled cells, levels of brain derived neurotrophic factor (BDNF) expression, and nerve growth factor (NGF); levels of dopamine and serotonin; seizures; expression of amyloid-β; and effects on neuronal pain pathways. It was found that prenatal music increased the number of cells in the motor cortex and somatosensory cortex. Moreover, the brain cells of rat fetuses exposed to music were morphologically more complex than those of rat fetuses not exposed to music. Twenty-one studies investigated the effects of music on behavioral outcomes, specifically learning abilities, anxiety-related behavior and stereotypic behavior as investigated by behavioral tests. Music interventions enhanced learning abilities of rodents, specifically those involved with spatial learning. Also, music statistically significantly decreased anxiety-related behavior in seven out of nine studies. A statistically significant decrease in blood pressure was noted in three out of four studies.It was also found that high-frequency music was

more effective in decreasing blood pressure than was low-frequency music, with an absent effect at the lowest frequencies.

4.6 Summary of Findings

It was found that exposure to music decreased anxiety in all included studies. Both spatial memory and anxiety might be affected by the level of BDNF. Low levels of BDNF have been associated with anxiety and aggressive behavior in mice and with anxiety and depression in humans. Furthermore, music exposure possibly counteracts the adverse effects of stress and thereby enhances the immune function. Also enhanced production of anti-inflammatory cytokines and regulatory T-cells restrained the immune-system in the presence of music and thereby significantly lengthened the survival times of transplants. The results of this systematic review indicate that music exposure can exert positive effects on rodents' neurological, behavioral, immunological, and physiological outcomes. These results are broadly consistent with studies in humans that found that music exposure can positively affect brain structure and chemistry, behavior, immunity, and physiology of a human body.

Conclusion

"Only when we look at music in this way do we start to see the interface to how the brain and body work together with music"

In a nutshell we can now definitely say, Music very much has a way of enhancing quality of life and can, in addition, promote recovery. If people are having trouble, there’s usually a way that music can help.

For some, Music is life itself, but now for us, music shall be a bridge to enter a world of peace , harmony with added flavours of the satisfaction of how music therapy can do wonders!

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