THE ROLES OF MUSIC IN STRESS MITIGATION

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ABSTRACT

Music has been proven to have a positive impact on stress-related physiological, cognitive, and emotional processes while stress is believed to be one of the key elements affecting our health negatively. Long-term stress has been linked to poor individual health as well as significant societal costs. The paper provided the concept of stress noting that it is an ambiguous term and has connotations that make it less than useful in understanding how the body can adapt or fail to adapt efficiently to experiences in daily life, including both daily hassles as well as major life events and abuse or trauma. It also gave an explanation on the concept of music, types of music. Melody, rhythm, harmony, tempo, dynamics, and timbre are all used as the concept of music to produce repetition, variety, and contrast. It was on this basis that the paper concluded that Music has been endowed with restorative, therapeutic, and other medical values due to the fact that it is assumed that music also influences stress-related cognitive processes and, as a consequence, physiological responses. Previous investigations found reductions in perceived levels of psychological stress, increased coping abilities, or altered levels in perceived relaxation after listening to music in the context of a stressful situation. One of recommendations was that, the public should be detailed about the disastrous effect of stress and the health benefits about listening to music.

KEYWORDS: Roles of music and stress mitigation.

Introduction

Stress is believed to be one of the key elements affecting our health negatively. Long-term stress has been linked to poor individual health as well as significant societal costs (Thoma, La Marca, Brönnimann, Finkel, Ehlert, & Nater, 2013). Many physical and emotional problems, such as cardiovascular disease, chronic pain, anxiety disorders, depression, burnout, and addictions, have been linked to high stress levels (American Psychological Association [APA], 2017;

Australian Psychological Society [APS], 2015; Casey, 2017; Howe, Chang, & Johnson, 2013; McEwen & Gianaros, 2010). As a result of the difficulty of reducing or preventing stress without professional assistance and the high demand for nonpharmacological stress reduction interventions (de Witte, Spruit, van Hooren, Moonen, & Stams, 2020), the development of cost-effective stress prevention or stress management approaches has become a major focus of current research efforts.

Music has been proven to have a positive impact on stress-related physiological, cognitive, and emotional processes (Nater, Abbruzzese, Krebs, & Ehlert, 2006; Juslin & Sloboda, 2010; Burns, Labbé, Williams, & McCall, 2009). Music listening and making has been linked to a variety of favourable effects in the areas of health and well-being (Koelsch, 2015; Thaut & Hoemberg, 2014; Zatorre, 2015). The relaxing and stress-relieving effects of music are the most well-studied (Chanda & Levitin, 2013). Music has been utilised as a stress-reduction technique for decades, including music activities (such as singing or composing music), music listening for a specific patient group ('music as medicine,' and live music therapy provided by music therapists (Bradt, Dileo, & Shim, 2013b). However, the use of music as a cost-effective, non-invasive, and widely acknowledged intervention method in the management of stress and stress-related health issues has piqued interest.

Concept of Stress

"Stress" is an ambiguous term and has connotations that make it less than useful in understanding how the body can adapt or fail to adapt efficiently to experiences in daily life, including both daily hassles as well as major life events and abuse or trauma. In physiology and medicine, the general definition of stress is introduced by Selye (1956), cited in de Witte, et al. (2020), "stress is a general activation reaction to a stimulus that could mean both a challenge (in a positive way) and a threat (in a negative sense)". There has been much controversy and debate about Selye's concept of stress. Other definitions of stress, reviewed in detail by Selye in his Stress in Health and Disease, include the following:

- In behavioural sciences, stress is regarded as the "perception of threat, with resulting anxiety, discomfort, emotional tension, and difficulty in adjustment."
- In the group situation, lack of structure or loss of anchor "makes it difficult or impossible for the group to cope with the requirements of the situation, and the problem of leadership and interpersonal behavior becomes one of

evolving or supplying a structure or anchor and of supplying the expertness for coping with the demands of the situation."

- Stress can also be defined in terms of pure neuroendocrinology. For example, Yates defined stress as any stimulus that provokes the release of adrenocorticotropic hormone (ACTH) and adrenal glucocorticoids.

Accordingly, Aldwin (2007) emphasized the negative part of stress and defined it as the quality of an experience produced through a person-environment transaction that, through either overarousal or underarousal, results in psychological or physiological distress (Riley & Park, 2015). Linden (2005) added that stress represents both a psychological and a physiological reaction to a real or perceived threat that requires some action or resolution. It is a response that operates on cognitive, behavioral, and biological levels that, when sustained and chronic, results in significant negative health effects. Stress is, therefore, not only what happens when life exerts pressure on us, but also the way it makes one feel. According to landmark brain researchers McEwen and Wingfield (2010), stress is both a stimulus and a response.

Stress responses can be categorized as physiological arousal and emotional responses (Li & Goldsmith, 2012). Together, the underlying systems of these responses regulate stress and affect each other during stress (Linnemann, Strahler & Nater, 2017). The physiological response to stress implies the activation of the hypothalamic-pituitary-adrenal (HPA) axis and, because of the release of adrenalin and noradrenalin, increased activity of the sympathetic nervous system, resulting in increased physiological arousal, such as heart rate, blood pressure, and cardiac output (Pfaff, Martin, & Ribeiro, 2007). While in the emotional response to stress, it can be described as emotional states of subjective worry, such as state anxiety, restlessness, or nervousness (Akin & Iskender, 2011).

Concept of Music

Melody, rhythm, harmony, tempo, dynamics, and timbre are all used as the concept of music to produce repetition, variety, and contrast. Many authorities have proposed definitions, but defining music is more difficult than it appears at first glance, and there is ongoing discussion. A number of explanations begin with the idea that music is an organized sound, but they also point out that this is an overly wide definition, citing examples of organized sounds that aren't considered music, such as human speech and noises heard in both natural and industrial settings (Kania, 2014). The influence of culture on musical cognition complicates the task of defining music. Philosophers have taken an interest in defining music in the

field of art. Jerrold Levinson in 1990, with the goal of defining music as an art, proposed that music is "sounds temporally organized by a person for the purpose of enriching or intensifying experience through active engagement (e.g., listening, dancing, performing) with the sounds regarded primarily, or in significant measure, as sounds" (Davies, 2010). Kania (2011) defines music as (1) any purposely produced or organized event, (2) to be heard, and (3) to have certain basic musical qualities, such as pitch or rhythm, or to be listened to for such features. Generally, "Music," according to dictionaries, is "the art of combining vocal or instrumental sounds to produce beauty of form, harmony, and emotional expression." Some music genres, such as noise music and musique concrète, challenge these notions by employing sounds that aren't generally thought of as musical, beautiful, or harmonious, such as randomly generated electronic distortion, feedback, static, cacophony, and sounds created using indeterminate compositional processes (Priest, 2013; Hegarty, 2007).

Interestingly, many languages of other cultures do not contain words that can be adequately translated as "music" as that word is typically understood by Western cultures, owing to conflicting underlying notions of music (Nettl, 2005). There is no generic term for music in Inuit and most North American Indian languages. The Aztec doctrine of rhetoric, poetry, dance, and instrumental music employed the Nahuatl term *In xochitl-in kwikatl* to refer to a complex combination of music and other poetic verbal and non-verbal aspects, while *Kwikakayotl* (or cuicacayotl) was reserved only for sung emotions (Leon-Portilla, 2007). In the Nigerian languages of Tiv, Yoruba, Igbo, Efik, Birom, Hausa, Idoma, Eggon, and Jarawa, there is no word for music. Many other languages have terminology that only cover a portion of what "music" signifies in Western culture (Schafer, 2009). Although the Mapuche of Argentina have no name for music, they do have words for instrumental vs spontaneous forms (*kantun*), European and non-Mapuche music (*kantun winka*), ceremonial songs (öl), and tayil (Robertson–de Carbo, 2006). While some West African languages do not have a vocabulary for music, others recognise the general concepts of music (Nettl, 2009).

Types of Music

Music can be described in terms of many genres and styles. Classifications are often arbitrary, and may be disputed and closely related forms often overlap. Larger genres and styles comprise more specific sub-categories (Wikipedia, 2020).

A music genre is a conventional category that identifies some pieces of music as belonging to a shared tradition or set of conventions. It is to be distinguished from musical form and musical style, although in practice these terms are sometimes used interchangeably (Samson, 2012). Music can be divided into genres in varying ways, such as into *popular music* and *art music*, or *religious music* and *secular music* (Wikipedia, 2017).

Art Music: Art music primarily includes classical traditions, including both contemporary and historical classical music forms. Art music exists in many parts of the world. It emphasizes formal styles that invite technical and detailed deconstruction and criticism, and demand focused attention from the listener. However, in western part of the world, art music is considered primarily a written musical tradition preserved in some form of music notation rather than being transmitted orally, by rote, or in recordings, as popular and traditional music usually are (Wikipedia, 2017). Art music may include certain forms of jazz, though some feel that jazz is primarily a form of popular music.

Popular Music: Popular music is music with wide appeal that is typically distributed to large audiences through the music industry (Middleton and Manuel, 2001). These forms and styles can be enjoyed and performed by people with little or no musical training. Popular music is found on most commercial and public service radio stations, in most commercial music retailers and department stores, and movie and television soundtracks. Manuel (2008) states that one criticism of popular music is that it is produced by large media conglomerates and passively consumed by the public, who merely buy or reject what music is being produced. He claims that the listeners in the scenario would not have been able to make the choice of their favorite music, which negates the previous conception of popular music. Middleton (2000) argues that if research were to be done on the field of popular music, there would be a level of stability within societies to characterize historical periods, distribution of music, and the patterns of influence and continuity within the popular styles of music.

Religious Music: Religious music (also sacred music) is music performed or composed for religious use or through religious influence. Gospel, Spiritual, Christian music, Sikh music, Jewish music, Hindu music, Neopagan music, Rastafarian music, Shintō music, Buddhist music and Zoroastrian music are examples of religious music (Wikipedia, 2017).

Secular Music: Secular music is non-religious music were the two main genres of

Western music during the Middle Ages and Renaissance era. The oldest written examples of secular music are songs with Latin lyrics. However, many secular songs were sung in the vernacular language, unlike the sacred songs that followed the Latin language of the Church. The largest collection of secular music from this period comes from poems of celebration and chivalry of the troubadours from the south of France (STANDS4, 2020). These poems contain clever rhyme-schemes, varied use of refrain-lines or words, and different metric patterns. The minstrels of this time were not themselves poets or composers. Instead they adapted the compositions of others to sing, play, and dance to in their own unique versions. Other styles of secular music included love songs, political satire, dances, chansons, and dramatic works (Grout and Palisca, 2006).

Health Benefits of Music

Throughout history, music has been endowed with restorative, therapeutic, and other medical values. The relationship between music and health has gotten a lot of attention from academics, the media, and the general public. From as early as 4000 BC to the present, musicians, therapists, philosophers, and other artists and scholars have chronicled its physical, mental, and social effects in treatises (MacDonald, Kreutz & Mitchel, 2012b). Clearly, the link between music, health, and happiness is complicated, with many facets and challenges. Practitioners and researchers all around the world have been developing and researching musical inventions in order to investigate innovative, non-invasive, and economically viable interventions that incorporate contemporary concepts of health and music. In many ways, musical research has been at the forefront of this new generation of studies looking into the positive impacts of music on human health (MacDonald, Kreutz, & Mitchell, 2012a).

Many physical, psychological, and social benefits are related with music, according to A.G. Rhodes Health & Rehab (2015), especially for persons who struggle with dementia and other cognitive and physical issues. Music is therapeutic and aids in the reconnection of people with their surroundings. People's longest-lasting memories are frequently musical memories, and listening to, playing, or singing familiar songs might assist them recall past events. Furthermore, A.G. Rhodes Health & Rehab (2015) noted that music has a variety of health benefits. Music:

- Stimulates the brain
- Leads to increased involvement in activities
- Lessens stress and anxiety
- Lessens feelings of isolation and loneliness

- Reduces depression
- Increases productivity
- Improves one's mood
- Increases energy levels
- Increases cardiovascular strength
- Improves respiratory function
- Creates opportunities to communicate
- Provides avenues for creative expression
- Slows the decline of cognitive skills
- Minimizes the effect of arthritis
- Creates bonding experiences
- Fosters happiness and pleasure

In today's world, music is used in a variety of ways. Music can be used for "recreation, lifelong learning and education, social engagement, emotional expression, self-therapy, and spiritual expression" (Harris, Hays, Kottler, Minichiello, Olohan & Wright, 2005). It's also been discovered as a way to encourage healthy ageing. According to a study on the impact of music on the lives of elderly persons, the following benefits were discovered: It provides "ways of understanding and developing their self-identity, connecting with important life events and other people, maintaining wellbeing, experiencing and expressing spirituality, and enhancing cognitive and physical functioning," as well as contributing to improved quality of life, self-esteem, sense of competence, and independence, as well as combating isolation and loneliness (Hays, 2002, cited in Ellis, 2018). The Music for Life Project in the United Kingdom (UK) looked into the health benefits of older people participating in community music activities. They discovered that group activities provided numerous perceived benefits, with those who participated in choirs, instrumental music, and other music activities reporting higher levels of enjoyment (Hallam, Creech, Varvarigou, McQueen, & Gaunt, 2014). A group of elderly adults who were members of a University of the Third Age (U3A) choir in Australia enhanced happiness and connectedness, according to a study. They were able to "make friendships with like-minded people and get a sense of accomplishment and pride from being a member of a successful choir" in addition to their new musical abilities (Joseph & Southcott, 2015).

Music and Mitigation of Stress

Recent neuroscientific studies provide insights into how music interventions may lead to stress reduction and increased well-being. Firstly, music seems to be able to decrease physiological arousal, which is increased during stress. Music listening and music making/singing have been associated with decreases in physiological arousal, shown by reductions in cortisol levels or a decrease in heart rate and blood pressure (Hodges, 2011; Koelsch et al., 2016; Kreutz, Murcia, & Bongard, 2012).

Music may also affect stress-related emotional states such as subjective worry, anxiety, restlessness, or nervousness (Pittman & Kridli, 2011). This is because music can modulate activity in brain structures that are known to be crucially involved in emotional processes. Recent neuroimaging studies on music and emotion showed that music may strongly influence the amygdala, a part of the limbic system, which is a section of the brain that plays a crucial role in the regulation of emotional processes by releasing endorphins. These neurotransmitters play an important role in enhancing a sense of well-being (Hodges, 2011; Koelsch, 2015; Moore, 2013; Zatorre, 2015). In the (cognitive) behavioural framework, it takes into account that music can serve as a distractor, diverting attention from a stressful event to something more pleasant, which reduces stress levels (Vaajoki, Kankkunen, Pietilä, & Vehviläinen-Julkunen, 2011).

Research on potentially beneficial effects of music listening on hypothalamus-pituitary-adrenal (HPA) axis functioning, i.e. on stress-induced cortisol release, has only recently been established. Significant positive changes in cortisol were reported when listening to music before and or during medical interventions considered stressful (decreases and lower increases in cortisol) (Ventura, Gomes & Carreira, 2011) and after such interventions (greater reductions in cortisol) (Nilsson, Unosson & Rawal, 2015). The few laboratory-based studies show inconsistent findings, though: some report that music was effective in suppressing a stress-related increase in cortisol, or in decreasing cortisol levels following a stressor when compared to a non-music control condition (Suda, Morimoto, Obata, Koizumi & Maki, 2018). In the sympathetic nervous system (SNS) parameters, the beneficial effects of music have a longer tradition. A series of clinical and laboratory-based studies revealed that listening to music can decrease sympathetic activity (Hodges, 2011).

However, as listening to music has the capacity to initiate a multitude of cognitive processes in the brain (Peretz & Zatorre, 2015), it is assumed that music also influences stress-related cognitive processes and, as a consequence, physiological responses. Previous investigations found reductions in perceived levels of psychological stress, increased coping abilities, or altered levels in perceived relaxation after listening to music in the context of a stressful situation (Allen, Golden, Izzo, Ching & Forrest, 2011).

Conclusion

Music has been endowed with restorative, therapeutic, and other medical values due to the fact that it is assumed that music also influences stress-related cognitive

processes and, as a consequence, physiological responses. Previous investigations found reductions in perceived levels of psychological stress, increased coping abilities, or altered levels in perceived relaxation after listening to music in the context of a stressful situation

Recommendations

1. The public should be detailed about the disastrous effect of stress and the health benefits about listening to music.
2. It is important that local, state, and national goals for effective listening to music take into account the positive outcomes of fostering lifelong and reducing stress-related problems through music.
3. Government should work hand in hand with both the public and private health sectors to organize workshops and seminars on stress management for the public. They should be enlightened not to be caught up in the daily hustle and bustle of their lives, which might make them forget to take care of their own needs.

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