

Arts, Linguistics, Literature and Language Research Journal

IATROGENESIS IN RELAXATION FREQUENCIES: HYPEREXPOSURE

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<http://lattes.cnpq.br/8611105055296074>

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Abstract: Introduction. Faced with the hyperexposure of works for meditation and relaxation, as well as for specific frequencies, it is necessary to discuss the exposure time of these frequencies used in these works by the human body, in a random way, without a concrete study on the subject. **Goal.** To demonstrate the importance of the scientific study on the exposure time of works for meditation and relaxation in streaming channels, with long exposure, at certain frequencies. **Method.** Exploratory study. **Results.** Realize the importance of developing a serious test about frequencies and hyperexposure in the listener's body, to understand their supposed contraindications. **Final considerations.** The lack of material on the subject and its implications for the individual is evident, as it has been shown that excess frequencies in the body can cause adverse reactions. **Keywords:** 1.Relaxation. 2.Binaural. 3. Iatrogenics. 4.Music Therapy. 5.Vibroacoustics and Frequencies.

INTRODUCTION

'...vast sea of exchanged vibrations...' (André Luís)

We live in an ocean of vibrations and sounds that almost no one is aware of. From the inaudible sound of the LED lamp in our house to the almost unbearable sounds of the streets, buildings, they all invade us. The question is: how much do they harm us? Research suggests that these noises negatively influence the individual and can significantly contribute to stress in general, including in particular ICUs and NICUs, as well as employees of these units and individuals in general. A systematic review showed that nurses' performance and health were negatively affected by noise in the workplace (SOUZA; MELO, 2021), as were patients. On the other hand, frequencies can benefit us in several ways, such as

improvement in psychological condition in the face of stressors to physical treatments, such as chronic pain, fibromyalgia, spasticity, among others. What Bruscia (2016) defines as the administration of vibratory frequencies to the client's body, or Zain (2014) as all music therapy approaches that use musical experience, sounds and sound vibrations for therapeutic purposes, both agree that it is a receptive experience. When well guided, this experience can be very beneficial for the individual, and can even bring about a cure or a solution to the problem presented. A simple experiment with salt or sand on a metal plate, played with a violin bow can show us the effects of sound waves on physical matter (LEINIG, 2008), imagine the effects on the human body, which receives these vibrations. not only through the auditory pathways, but also through the bone, watery, nervous and even energetic pathways. Interactions with controlled vibrations can be transformative and functional in our lives (LEEDS, 2010), but we must take care of the excess of these frequencies, which can be harmful to the body as a whole. With the advancement of technology, new possibilities emerge in the world of sounds, based on specific sound frequencies. In the immense online universe, there is a new sound consumption of frequency with indications for "health". And it is from this context that the question arises: how much do we need 8 hours of so-called beneficial frequencies, sleep listening to them or spend the whole day exposing ourselves to them? There is a tendency to give credibility to what the internet offers as being good, to the detriment of serious and tested scientific studies. In a short search on a famous streaming platform, the so-called MERSBE - Market of noises and sounds for well-being (PEREIRA, 2018) - opens up in an immense list, presented in videos with color effects, many with eight hours of duration, actually

in the millions, with listening instructions throughout the night, during the individual's sleep. The question that moves us is: what are the real effects of long-term "mersbe", with determined frequencies, on the body?

CONCEPTS

To understand the frequencies, it is necessary that we understand some concepts, described here. First, the sound parameters, being **pitch** - bass and treble; **duration** - short and long; **intensity** - strong and weak and **timbre** - quality or coloring of sounds. A short glossary follows: **acoustics** - According to Michaelis dictionary: "part of physics that studies sounds, sound waves and the phenomena that are pertinent to them" (2021); **ASMR** - Autonomous Sensory Meridien Response; **breadth** - according to Michaelis dictionary: "state, quality or character of what is broad". (2021), according to Lacerda (2018): It consists of the magnitude of the oscillation of a wave in a given period. It can be measured through the difference between amplitude peaks or through the root mean square (RMS) measurement; **binaural** - According to Pereira (2018): As the name binaural indicates, these are sounds that relate to both ears. According to Lacerda (2018): listening to sound through two ears. According to Ataíde (2015): Adequate hearing condition that allows the listener the dimension of depth and sonority necessary for the perception of the sound world; **aural culture** - according to Pereira (2020): auditory culture; **acoustic energy** - According to Michaelis dictionary: "part of physics that studies sounds, sound waves and the phenomena that pertain to them". (2021); **entrainment** is the rhythmic synchronization of an oscillation with an external stimulus. It is a recurring phenomenon in nature and biologically present in living beings; **phase** - According to Lacerda (2018): corresponds to the position of a point in a wave cycle in

time. The phase difference corresponds to the difference in position of two waves of the same frequency. It is measured in degrees or radians; **flow state** - according to Claro (2020): mental state of operation in which the person is fully immersed in what he is doing, characterized by a total feeling of involvement and success in the activity process; **force** - according to Michaelis dictionary: "any cause capable of producing or accelerating movements, offering resistance to displacements or determining deformation of bodies". (2021), according to Roederer: "the force unit is defined as the force necessary to accelerate a 1Kg body at a rate of 1m/s" (1998); **frequency** - According to Michaelis dictionary: "number of vibrations per unit of time, in a periodic phenomenon. In alternating currents, the inverse of the period duration. (2021); **isochronic** - according to Michaelis dictionary: same duration. According to Lacerda (2018): Regular frequency of an event; **meditation** - according to Michaelis dictionary: act of meditating, deep reflection on a subject or object. Concentration of the Spirit that Prepares the Mind for Concentration (2021); **working memory** - consists of a cognitive system of limited capacity responsible for the temporary storage of information available for processing; **ambient music** - according to Pereira (2020): Silence x noise; **brain wave** - consist of rhythmic patterns of neuronal activity at the level of the central nervous system. They are divided into 5 main intervals, depending on their frequency: delta (≤ 3 Hz), theta (4 Hz - 7 Hz), alpha (8 Hz - 12 Hz), beta (13 Hz - 30 Hz) and gamma (≥ 31 Hz). Hz); **sound wave** - "Pressure wave in an elastic medium perceptible by the human auditory system and whose frequency is in the region between 20Hz and 20,000Hz." **divergent thinking** - a mental process used to generate ideas through the creative exploration of multiple solutions, while convergent thinking refers to a mental

process that usually provides a single correct solution to one or more problems (Dietrich & Kanso, 2010); **relaxation** - according to Michaelis dictionary: act or effect of relaxing; **resonance** - according to Michaelis dictionary: “amplification of sounds. Characteristic of what is resonant. Phenomenon of transmission of a vibratory movement”. (2021); **noise** - according to Roederer (1998): beats in tune out of tune. According to Michaelis Dictionary: any noise or inharmonic sound produced by irregular sounds. According to Schafer (2011): unwanted sound; **white noise** - according to Lacerda (2018): signal that contains all audible frequencies at the same amplitude, resulting in a sound with higher amplitude in high frequencies; **pink noise** - according to Lacerda (2018): signal that contains all audible frequencies decreasing by 3 dB in amplitude per octave, resulting in a sound with equal amplitude between all octaves of the spectrum. **autonomic nervous system** - is divided into two parts: the sympathetic nervous system and the parasympathetic nervous system. Both have different functions, the main ones being body regulation in situations of tension for the first and relaxation situations for the second; **pure sound** - according to Lacerda (2018): consists of a sound whose waveform is sinusoidal. Refers to a sinusoid of any frequency, phase, or amplitude; **somnêncio** - according to Pereira (2020): silencing experience that presents itself as an important modulation of silence in contemporary times that opens ways to think, finally, about today’s aural culture; **vibration** - according to Roederer, “there is a certain type of movement in which the material

point follows a pattern that is always repeated; *vibration* - according to Michaelis dictionary: “act or effect of vibrating. Oscillatory and rapid motion of a solid body, relative to its center of balance, oscillation. Trepidation, vibrating movement” (2021). Throughout the article, we will see references to these concepts, mainly noise, the central focus of MERSBE, which has become an out-of-tune consonance with healing frequencies or other designations.

VIBROACOUSTICS

The origin of vibroacoustics studies dates back to the 1950s, more precisely 1959, when dr. Teirich went to treat a 59-year-old deaf patient, Sutermeister, who told him his method of listening: with the main speaker on his back, he received an internal sensation of vibration (Hooper, 2002). Teirich then bought a sofa with speakers and transferred the vibrations of Johann Sebastian Bach’s “Toccatà and Fugue in Re minor” (BWV 565) near the Solar Plexus ¹, just as his patient was doing. For this research, he used his medical friends as research subjects and several of them immediately reported their hot solar plexus, an immediate relaxation in the stomach and a very pleasant drowsy state. Teirich would have anticipated the development of vibroacoustics by about 20 years (HOOPER, 2002). This was not the actual origin of studies on sedative frequencies, but rather the origin of studies with frequencies throughout the body. At the origin of this therapy, neither receptivity nor interoceptive awareness was mentioned, ²and on a few occasions references were made to mental images. The sound bath was also not

¹ Solar plexus: greenish-yellow chakra, described by Stanislavsky (2008b): “I read what the Hindus say about this. They believe in the existence of a kind of vital energy, called prana, which gives life to our body. As they calculate, the center of radiation of this prana [energy] is the solar plexus. Therefore, in addition to our brain, which is generally accepted as the nervous and psychic center of our being, we have another similar source, close to the heart, in the solar plexus.”

Cindy Dale (2017) describes chakras as “subtle energy organs that control the flow of energy related to all parts of our life; they are the center of personal power”.

² Sense that informs the brain, at every moment, about the state of functioning of the body, through nerves present throughout the body, through nerves present in all organs (Michaelis, 2021).

considered as a technique, nor was the use of Tibetan bowls as a vibroacoustic resource, or even the lyre table or tuning forks considered (ZAIN, 2014). In the 1960s, more precisely in 1968, Olav Skille, a Norwegian from Steinkjen, developed music software, patented it and started his studies. Skille initiated what is now called vibroacoustic therapy (1989). Skille created a way to transmit the low frequencies, between 30Hz and 120Hz, through two speakers, coupled in a bed. This method became known nowadays as MULTIVIB, sold in the form of a vibrating mattress, based in Norway. Studies emerged in the 1980s, with physical and psychological stimulation, basically using low frequencies, between 20Hz and 70Hz, in sine waves, with patients lying on a bed, with speakers at the bottom, which emitted the frequencies in the bodies of these patients, as well as such as sedative music being played on the headphones, generating the effects studied. According to Tony Wigram (1996), these studies were quite limited, therefore experimental, and did not exactly have scientific support to serve as a basis.

MUSIC THERAPY

According to Kenneth Bruscia (2016),

“Music therapy is a systematic process of intervention in which the therapist helps the client to promote health using musical experiences and the relationships that develop through them as dynamic forces for change”.

Healing with sounds dates back to the dawn of humanity and there are reports in the Holy Scriptures, text from Samuel (ch. 16; v. 14-23), in which David, son of Jesse, was chosen by Saul to play the lyre when he was possessed by ‘evil spirits’ and so King Saul was healed. Music and the Universe are organized by vibrations and music/sounds can be used to restore harmony between individuals and between individuals and the Universe. The first focus

would be on the sound/vibration relationships between matter and energy (BRUSCIA, 2016) and, through these relationships, healing. Music therapy involves numerous interactive techniques (client actively participates in the session, interacting with the therapist) or receptive (client passively participates in the session, listening to sounds, music, resonances or vibrations according to their needs and the therapist’s guidance). Among them are vibroacoustics, projective design, healing techniques with vibration, sound and music (BRUSCIA, 2016), which involves all music therapy approaches that use musical experience, sound and sound vibrations for therapeutic purposes, both in groups and in groups. individual (ZAIN, 2014).

SOUND HEALING

In all the sacred books of the World there is the phrase “in the beginning was the sound...” leading to believe that the World was created by the vibration of some sound and, for Eastern cultures, the mantra OHM would be that sound (BERENDT, 1983). Sound healing dates back to antiquity. All human cultures, primitive and developed, have music embedded in them, varying the ways of listening and performing according to the culture and all have one thing in common, the organization of silence and sound involved in a purpose of human expression. CROWE, 2004). Music involves the act of human consciousness of choosing and combining tones and placing them in rhythmic patterns over time and there is not exactly an evolutionary advantage in the behavior we call music (PINKER apud CROWE, 2004). The ancients believed that the combination of sounds and mathematics gave the exact notion of the divine stabilized law and that was the mixture of the esoteric and the concrete, which gave a mystical power since the ancients and this idea has permeated history in many cultures, including Greece.

and Rome (CROWE, 2004).

VIBROACOUSTIC DISEASE

We are constantly exposed to internal and external noise. With this in mind, the item “vibroacoustic disease” was also opened. Vibroacoustic disease is a systemic disease caused by prolonged exposure to high amplitude noise - ≥ 90 dB - and low frequency - < 500 Hz, including infrasounds (MAGALHÃES, 2010) and preferentially attacks collagen and elastin, in addition to cardiovascular structures, CNS and respiratory system.

VIBROACOUSTIC APPROACHES

According to Bruscia (2016), we can think of 5 vibroacoustic approaches: **electronics**, using electronically generated vibrating frequencies to weaken “the muscle bonds of diseased cells”; **resonance, resonance in the vibratory relationships in the body using the fundamental tones and their electronically generated harmonics**; **ultrasound : tracking the body and its internal organs with pulses of high-frequency sound waves, generated electronically, for medical diagnosis**; the **Tomatis method**, which uses electronic instruments to diagnose and stimulate auditory functions and **resonance with tuning forks**, the use of two tuning forks to resonate different areas of the body in order to intensify meditation and healing, in addition to the frequently used **electrostimulation**, music therapy in the prevention and stress treatment; of the Tibetan cuencos, the Vibroacoustic bed and the Vibroacoustic mattress.

MERSBE

In reference to the new ‘market of noises and sounds for well-being’, MERSBE refers to everything we hear, all frequencies, meditation music, commercialized sounds, aimed at well-

³ Aural = relating to or belonging to the ear; auditory (MICHAELIS, 2021)

being (PEREIRA, 2018). The idea would have emerged from the observation of a sheep toy, which played a certain type of music to calm the child who needed to sleep. There is a growing exploratory market for music for meditation, relaxation, binaural listening and 432Hz and 528Hz frequencies, as shown in the figures below, which were the trigger for this work. According to Pereira (2018; 2020), care must be taken when exploring a new sound market, thinking about sounds, noises and well-being. MERSBE meets the Aural Culture ³which, according to Valparaíso (2017), concerns everything that is heard, as hearing is a sense that, unlike vision, has a 360° range. We listen below, above, behind, in front, to the sides. The aural culture would also come against the non-silence, the occupation of the sound space in other instances and the resignification of what was considered noise to the opposite, a frequency of healing, with a pitch defined in Herz, which the phonographic market uses widely. spectrum (PEREIRA, 2018). Still on aural culture, author Vinicius A. Pereira (2018) calls for greater attention to Binaural, they are produced from a recording process known as dummy head recording, in which two microphones are placed. if at the height of both ears, which can be a mannequin or any object that maintains the physical features of a human face. The history of binaural comes from the German physicist Heinrich Wilhelm Dove who, in 1839, discovered that when two sounds at close frequencies are presented, each to one ear, the brain would produce a third frequency that would be the difference between the frequencies of the sounds heard. (Pereira, 2021).

DISCUSSION

“ It is known that everything that vibrates has its resonance frequency, whether we can hear it or not, and that from the orbits of Planets around the Sun to the movement

of electrons around atomic nuclei. With this concept of sounds, we coherently come to the conclusion that every organ, bone and tissue in the human body has its own frequency and resonance, and with this, the vibrations of one body can expand and reach another vibrating body. ” (Clotilde Espinola Leinig)

The authors mentioned in this article discuss the exposure time and the type of sounds used in therapy, but the market shows millions of results, of which it is not yet known how it works and what is happening. The market needs studies in the areas of psychoacoustics, marketing, sound anthropology, music therapy, art therapy, acoustic physics, neuromarketing. It needs a psychoacoustic study to better understand this new form of technology and music therapy to understand how this sound form interferes with the intramusical issue of the individual, as well as anthropologically it would be a new category of relationship with music, which uses neuromarketing as a bargaining chip. on streaming platforms, which monetize them according to the number of views and channel subscribers. The health professional has to be responsible for what they produce and show a responsible health attitude. The music therapist uses sound and music as co-therapists. Therefore, it is valid to make use of this knowledge in a lucid way. The author presents an example to open this field of critical analysis of the random use of sound, without knowing the consequence of it, as in the case of the individual who is sleeping, his brain must be resting and not frequently making stimuli. It is indicated that we have to turn off the light, decrease visual stimuli for the production of melatonin, so why increase auditory stimuli? Where would that foundation be?

an important survey on works that use sounds and frequencies already studied, in an indiscriminate and random way, with the intention of thinking about health, with a new perspective for health professionals and Integrative Care. It is also a criticism of the unbridled use of such frequencies with high exposure time, having as a point of investigation the caregiver, who needs to be aware of these practices, having this analysis for reflection. The importance of bringing the subject to integrative health is clear, as the articles read bring many gaps to be filled.

FINAL CONSIDERATIONS

This is an exploratory work, which begins

REFERENCES

- ALMEIDA, G. V. M. RIBAS, A. ATAÍDE, A. L. Reabilitação de perdas auditivas unilaterais por próteses auditivas implantáveis: revisão sistemática. Curitiba: UTP, 2015.
- BERENDT, J. E. Nada Brahma: a música e o universo da consciência. São Paulo: Cultrix, 1983. BÍBLIA SAGRADA: nova tradução na linguagem de hoje. São Paulo: Paulinas Editora, 2019. 1504p.
- BRUSCIA, K. E. Definindo musicoterapia. Tradução de Mariza Velloso Fernandez Conde. 3 ed. Rio de Janeiro: ed. Enelivros, 2016.
- CARRER, L. R. J. Musicoterapia vibroacústica - um movimento transdisciplinar promovendo qualidade de vida: um estudo de caso.
- CLARO, C, LAPA, E. M. **A música na lupa da Psicologia Face à pandemia: Covid- 19!** Lisboa: International Journal of Developmental and Educational Psychology. INFAD Revista de Psicologia, Nº1 - Volume 1, 2020.
- CROWE, B. Music and soulmaking: toward a new theory of music therapy. Oxford: Scarecrow press, 2004.
- DALE, C. Manual prático do corpo sutil. São Paulo: ed. Cultrix, 2017.
- HOOPER, J. Is VA therapy, music therapy? Music Therapy today (online), 2002.
- LACERDA, P. O. F. **Batimentos binaurais e tons isocrônicos:** das características aos efeitos. [Dissertação]. Porto: Universidade Católica Portuguesa, 2018.
- LEEDS, J. **The Power of Sound:** how to be healthy and productive using music and sound. Healing Arts Press ed. California: 2010.
- LEINIG, C. E. A música e a ciência se encontram: um estudo integrado entre a música, a ciência e a musicoterapia. Curitiba: ed. Juruá, 2008.
- MAGALHÃES, A. A. Doença vibroacústica: haverá 'ruído' além do 'ouvido'? Trabalho final apresentado à Universidade de Coimbra, 2010. Disponível em: <https://estudogeral.uc.pt/handle/10316/31393>
- MARTINI, F. G. **Escuta de um ouvido autômato:** estética e erotismo do ASMR. Caxias do Sul: Revista da Associação Nacional dos Programas de Pós-Graduação em Comunicação, 2020.
- MICHAELIS. Dicionário. [Online]. [acessado em 16 de outubro de 2021]. Disponível em: <http://michaelis.uol.com.br/moderno/portugues/>.
- MULTIVIB. Software de música e vibroacústica, disponível em: <https://multivib.com/en/olav-skilde-2/>
- PEREIRA, V. A. MERSBE – Mercado de Ruídos e Sons para o Bem-Estar: Modulações da Escuta e Cultura Aural Contemporânea. Artigo apresentado no GT Estudos de Som e Música na XXVII COMPÓS. PUC-MG, Belo Horizonte, 05 a 08 de junho de 2018.
- PEREIRA, V. A. Sonlencio: modulações da experiência de silêncio na cultura aural contemporânea. Disponível em: https://revistaecopos.eco.ufrj.br/eco_pos/article/view/27459
- Revista Brasileira de Musicoterapia, disponível em <http://www.revistademusicoterapia.mus.br/wp-content/uploads/2016/12/2-Defini%C3%A7%C3%A3o-de-Musicoterapia.pdf>
- ROEDERER, J. G. **Introdução à física e psicofísica da música**, trad. De Alberto Luiz Cunha. São Paulo: Ed. Edusp, 1998.
- SCHAFFER, R. M. **O ouvido pensante**. São Paulo: ed. Unesp, 2011.
- SKILLE, O. **Vibroacoustic Therapy**. In: Music Therapy, vol.8, nº 1, p. 61-77. Steinkjer: Music Therapy, 1989.
- SOUZA, V. C. MELO, R. B. **Efeito dos ruídos da unidade de terapia intensiva na equipe de enfermagem:** uma revisão. Brazilian Journal of Health Review, vol. 4, nº4, 2021.

VILLANUEVA, J. **Revista de arte sonoro y cultura aural**, (3), editada por Samuel Toro y Fernando Godoy. Valparaiso: 2017, 56 p.

WIGRAM, A. L. **The effects of vibroacoustic therapy on clinical and non-clinical populations**. Ph.D. thesis. Aalborg: Jessica Kingsley Publishers, Aalborg University, 2016.

ZAIN, J. **Escuchar el silencio**: Musicoterapia vibroacustica. Buenos Aires: ed. Kier, 2014.

ZICA, S. M. **Produção e consumo de ASMR no Brasil**: uma análise exploratória de perfis e práticas nos canais do YouTube. [Monografia]. Brasília: Universidade de Brasília, 2019.