

Music and Skin: Are They Connected?

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The well-being state could be influenced by harmonic sounds in music or singing [1,2]. Preferred music could give joy, compared to classical music that induced mostly relaxation [3]. Medical Resonance Therapy Music® originated from Peter Hubner in Germany uses the theory of resonance, with sonic (20-2000 Hz) and subsonic frequency (0.034-5 Hz) synchronizing with cellular rhythm and restoring auto-healing capacity. An appropriate frequency of music can induce a state of relaxation with effect on reducing stress and restoration of different functions, including neuro-endocrine ones [4].

At the beginning of '90 appeared first observations correlating an improvement of spatial solving performances during listening to Mozart's piano sonata K448 [2]. These observations were completed by studies showing activation of cortical and subcortical areas where the emotions are processed when someone is hearing pleasurable music [5].

In young adults, music was associated with reduced anxiety [2]. Listening to music was also related to a reduced risk of depression, especially in older people [2].

Lento music was used for reducing examination anxiety for students (reduced pulse, increased finger temperature), fact that could be extrapolated at least for young people clinical examination [6]. A concept of nature sound (soft wind, bird twitter, ocean sounds) could create a subtle hospital ecosystem improving experience for both patients and nurses [7]. This kind of ambiance could reduce stress and anxiety, and could bring a sense of security and comfort.

Musical stimulus can modulate blood pressure, heart and respiration rates, EEG, temperature, galvanic skin response, parameters that could be easily measured in studies [1]. Immune and endocrine response could be influenced also [1]. Immunological response is affected by increasing the activity of natural killer cells and interferon- γ [5].

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There are very complex connections between vibrations, skin and music. On a hand, different types of vibrotactile stimuli could enhance the musical experience, giving the sense of being part of music [8]. On the other hand, vibro-acoustic stimulation by body monochord or exposure to relaxation music could improve someone's mood, results obtained by measuring skin conductance level [9].

Compared to silence, soothing music could induce a decrease in blood pressure, stress or post-operative trauma [10].

Music could divert the attention from unpleasant experiences of interventions. It was used as adjuvant before and during different types of interventions, reducing stress and anxiety [4].

Systematic reviews showed that pre-recorded music interventions could be very beneficial for reducing preoperative anxiety, state that could influence induction of anesthesia and impede post-operative recovery by increasing the risk of infection and a delayed wound healing [7].

The addition of music during the intervention of port catheter placement could reduce patients' heart rate, blood pressure, anxiety levels, being a simple and low-cost routine with good benefits for the patient [11].

The patient's attitude regarding dermatological procedures or surgery could be regulated by relaxing recorded or live music [12]. Listening to music during surgery is a potential useful, very simple intervention [13].

Music, guided imagery, hypnosis, distraction techniques are some of the approaches that could make much easier and pleasant the procedure for the patient, reducing stress and anxiety and helping him to be more cooperative [14].

Even sophisticated and extended Mohs surgery could have benefits from using personalized music that reduces patient's anxiety [15].

Even not all the studies have documented the positive effects of music or guided imagery on pain and anxiety of patient's during excisions under local anesthetic, they reported at least positive effect on surgeon's anxiety that could have a global impact on the procedure [16].

The impact of skin diseases on patient's life is affected by many factors, including age, gender, culture, type and severity of the disease. Taking care of the patient also includes taking care of the quality of life and for high value benefits, we have to keep in mind also holistic approach beyond medicines [17].

Music could help coping with different health conditions [2], reducing the burden of the diseases in patients' lives [4].

Pruritus is one of the most important symptoms in many skin diseases. The intensity and duration of itch could maintain a state of stress and could influence patient's mood and quality of life.

A case-control study on 68 patients with psoriasis, atopic dermatitis and two control groups. The experimental groups, besides their treatment, were also applied, daily, 3 sessions of 30 minutes of MRT-Music (Medical Resonance Therapy). These groups with music therapy experiences had reduced biologic parameters (blood pressure, pulse), a marked decrease in the stimulus to scratch and a reduction in the degree of sickness. The results were more important in psoriasis group. MRT-music appeared as an adjuvant that could be used with good effects [18].

There is a randomized case- control study on pruritus in 50 patients mostly with psoriasis, atopic dermatitis or contact eczema. In this study, pruritus had a significant impact on patient's quality of life (measured with ItchyQoL questionnaire, average scoring 64,8/110). A session of 20 minutes of music (patient's personal taste) of "U" sequence (stimulating-relaxing-awakening) was broadcasted on headphones comparing with control group that used an emollient cream on the entire body. There was an analysis before and after an hour from intervention. There were no differences between the two groups regarding satisfaction or anxiety (decreased by both interventions). There was a significant reduction of pruritus intensity in the group with music intervention compared to emollient 2.3 (SD 2.1) vs. 1.2 (SD1.7), $p < 0,05$. In music intervention group, 64% of patients reported improvements and their intention to continue. 91% of patients considered the music intervention worth to be recommended [19].

There are studies [20] measuring the effects of different types of music on different skin diseases. Mozart's music could have in vitro effects on total IgE and latex-specific IgE decreasing their production. There were also effects on cytokine pattern, increasing Th1 cytokine and reducing Th2 cytokine production. Taking into consideration these results, Mozart's music could be beneficial in atopic dermatitis, reducing skin wheal induced by latex (not also by histamine). In the same time, these changes were not found using Beethoven's music.

Atopic dermatitis has various psychological aspects correlating skin and brain, mind and body. Taking in consideration these aspects, mind-body therapies (MBT) should be considered. Besides education, meditation or mindfulness, hypnotherapy, cognitive behavioral therapy or habit reversal could be useful regarding itch-scratch cycle. Music therapy, massage or touch therapy could complete a holistic approach improving both the pruritus and the lesions, and in the end the quality of life [21].

A therapeutical experiment with thirty minutes of live saxophone music was made on 57 patients with haemodialysis (matched with 57 controls under the same chronic procedure). Blood pressure, heart rate, oxygen saturation, glycemia, mood, pain and itch were measured and observed. All parameters suffered improvements. A 75,7% reduction of pruritus was obtained with a better quality of life [22].

Children older than 5 years old with burns could be positively influenced by live music therapy sessions directly after wound care. This kind of intervention had no effect for smaller patients [23]. This kind of distraction could be also used for children needing allergy testing.

Vascular wounds are chronic lesions, usually very painful that require long periods of time of changing dressings. A pilot case-control study with adjunctive aromatherapy (lavender and lemon) or music therapy (relaxing or preferred music), during wound

dressing change revealed significant decrease of pain intensity in the groups that used lavender and relaxing music. These types of gestures used during dressing changes could have analgesic effect and could improve the quality of life [24].

Music without lyrics could be effective in pain management in adults [25]. A case-control study revealed the effect of positive emotions induced by music on pain; pain being significantly reduced in patients self-reporting music pleasantness. At the same time, warmth perception was not influenced by music, either pleasant or not [26].

Ambiental music could have miraculous effects during examinations, allergy testing in children, wound care, dermatological surgical interventions. Music can relief anxiety, stress, itch or pain with an important impact on patient's quality of life. Certain types of music (Mozart) could influence the immune response. Music combines immune effects with psychological ones, becoming a simple complementary therapy for dermatological patients [27].

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