

Low Frequency Sound Treatment Promoting Physical and Emotional Relaxation – Qualitative Study

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Abstract

Low frequency sound has many applications to medicine but the efficacy and effectiveness of low frequency sound treatment in health prevention remains unclear. The purpose of this study was to explore the perspectives and potentials of physioacoustic chair's low frequency sound treatment when applied to daily activities among a sample of music students, faculty and/or staff, and to examine how participants view the benefits of the intervention for their well-being, health and health-related activities. The results show that the physioacoustic low frequency treatment added to participants' subjective well-being by increasing their physical and emotional relaxation level, decreasing pain and stress, and increasing emotional enrichment and concentration. The study served as a pilot, to confirm stakeholder interest and to inform the feasibility of a larger study.

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Introduction

Low frequency sound has many applications to medicine. However, the extent to which human beings utilize and perceive low frequencies as beneficial when applied to their health prevention programs remain unknown, and the efficacy and effectiveness of low frequency sound treatment in health prevention and well-being remains unclear.

The aim of this qualitative pilot study was to develop a clearer description of this phenomenon, based on participants' perceptions of their low frequency sound treatment experiences. The purpose was also to explore the perspectives and potentials of the *physioacoustic low frequency sound treatment process*¹ when applied to daily activities among a sample of music students, faculty and/or staff. A final objective was to determine the feasibility of administering a further, quantitative study exploring the perspectives of participants regarding the application of low frequency treatment to health. Research questions were: (1) What is the participants' subjective experience concerning the low frequency treatment? (2) What impact do participants perceive this low frequency treatment to have on their health and well-being?

Relation to existing research and literature

The following preventative programs incorporate various low frequency programmes into their recommendations i.e.: Physioacoustic chairs (Hairo, 2002; Puncanen, 2004; Kärkkäinen, & Mitsui, 2006; King, Almeida, & Ahonen, 2009; Zheng, Sakari, Cheng, Hietikko, Moilanen, Timonen, Fagerlund, Kärkkäinen, Alèn, & Cheng, 2009), vibroacoustic programme also known as Vibroacoustic Therapy (VAT) (Skille, Weekes, & Wigram, 1989; Rüütel, 2002; Rüütel, Ratnik, Tamm, & Zilensk, 2004; Bergström-Isacsson, Julu, & Witt-Engerström, 2007; Lundqvist, Andersson, & Viding, 2008), Somatron (Brodsky, 2000). Another treatment program is the Whole-body-vibration (Fontana, Richardson, & Stanton, 2005; Haas, Turbanski, Kessler, & Schmidtbleicher, 2006).

Several research studies have already analyzed participant perspectives of low frequency treatments as a therapeutic tool in health prevention (Rüütel, 2002; Rüütel, Ratnik, Tamm, Zilensk, 2004; Sirkkola & Nieminen, 2007, Karkkainen & Mitsui, 2006), promoting the well-being in individuals and as a form of rehabilitation (Fontana, et al., 2005). For instance, low frequency treatments have been found to improve mobility, increase circulation (Karkkainen & Mitsui, 2006) and decrease low-density lipoprotein and blood pressure (Zheng, et al., 2009). Low frequency treatments may be an ideal alternative for individuals who are less active or are unable to exercise (Zheng, et al., 2009).

Low frequency studies include the use of physioacoustic chairs, whole-body-vibration, vibroacoustic therapy and Somatron, as a means of health prevention, improving the well-being, decreasing stress and anxiety, to name a few, for participants. Puncanen (2004) used physioacoustic chairs as part of the rehabilitation process when working with clients with drug additions. Puncanen found that the physioacoustic chair helped clients become aware and in touch with their physical body.

King, Almeida, and Ahonen (2009), researched the effect of vibration therapy with participants with Parkinson's disease. Through the use of a Unified Parkinson's Disease Rating Scale, a pressure sensitive mat, gait assessments were made. Lastly, a grooved pegboard was used to measure the dexterity and coordination of participants in their upper limbs. Researchers found the use of physioacoustic chair to have significant effects in decreasing rigidity and tremors with participants with Parkinson's disease. That is, following physioacoustic treatment there was a carry-over effect in the post-rest period (King, Almeida, & Ahonen, 2009). Similarly, the use of whole-body-vibration has been studied for its positive effects for people with Parkinson's disease (Haas, Turbanski, Kessler, & Schmidtbleicher, 2006). After receiving treatment, there was an improvement in reducing tremor and rigidity.

Rüütel, Ratnik, Tamm, and Zilensk (2004), used vibroacoustic therapy (VAT) with adolescent girls who had stress symptoms. Participants had ten VAT sessions (used the low frequency sound vibration of 56.7 Hz) and listened to relaxing music during the session. These treatments were complemented with other therapeutic techniques such as having a discussion, drawing and completing mood checklists. Researchers found that participants experienced a release of tension, increased self-discovery and VAT treatment to be a beneficial experience.

The use of Somatron increased relaxation (Standley, 1991). Brodsky (2000), found that professional orchestra musicians who had sessions in the Somatron Acoustic Massage Power Recliner with music playing had increased levels of relaxation, experienced imagery and experienced an intensified depth of verbal narrative. Specifically, there was a reduction of negative moods over a sequence of eight sessions. Brodsky concluded that, “music-generated whole-body vibroacoustic stimulation seems to enhance the intensity of self-related emotion and cognition during music listening” (p. 112) and further explained “whole-body acoustic stimulation incites a process of interaction from peripheral nervous system input, through activation of sympathetic and parasympathetic mechanisms of the central nervous system, causing a concentrated discharge of chemicals and hormones, resulting in intensified emotional responses which are then reported verbally by subjects” (p. 113). This remark was explained as there were three conditions for participants: no-music, music-alone, and music and vibration. The different qualities and levels of stimulation affected a participant’s outcome.

Methodology

Data Collection

Original data consisted of 11 volunteering participants: Music students (n=9), faculty/staff (n=2), males (n=2), females (n=9). The low frequency sound treatment process took place in the end of a winter semester, which is usually a very stressful time for music students, faculty, and staff.

The frequencies were delivered using the physioacoustic method (Lehikoinen, 1994, 1997, 1998; Ahonen, 2007). The participants were sitting on an arm chair and the physioacoustic software produced and controlled sound frequencies from its six speakers allowing the whole body to experience its effects. The software uses low frequencies, between 27-113 Hz. frequencies to cause the sound to vary around a fixed pitch (scanning). This is to ensure correct resonance frequencies. Participants sense a pulse-like sensation and a traveling sound pressure in the body that facilitates circulation (Lehikoinen, 1990). When sitting in the chair, legs, thighs, buttocks, back, shoulder, neck, and head were to be in contact with the surface of the chair at all times. Participants were instructed to close their eyes.

Each participant received individually selected frequencies and physioacoustic relaxation /massage programmes according to their needs (i.e. general relaxation, intensive back massage, shoulder massage). Therefore the individual session time varied between 30 min to 60 min.

The treatment process length varied. Eight of the participants received 8 sessions during the 8 week period, two of the participants received 6 sessions, and one participant only 4 sessions. It was the goal that all participants would receive 8 sessions during the 8 weeks period. However, due to the time-table issues, this was not always possible. Therefore, to ensure the validity of the study the data analysis only consists of data from 10 participants who received a minimum of 6 sessions, once a week.

In the beginning and in the end of the process, and in the beginning and in the end of each session participants were asked to answer structured qualitative questionnaires.

The pre-process questionnaire included open-ended questions investigating participant's physical sensations (such as tension, pain, relaxed). For instance, if they felt any tension, pain etc. they were instructed to color the "Body illustration" developed by Ahonen (2010) to best describe the area and to write down what they felt in that area. They were also asked to describe their emotions coming into this session. They were asked to make use of the "Feeling Wheel" illustration² and color the applicable feelings. Participants were also asked to rate their emotional and/or physical stress level using the following 5-point scale: 0=no stress at all, 1=little bit stress, 2=manageable stress level, 3=elevated stress level, 4=lots of stress, and 5=enormous amount of stress. If they were currently experiencing stress, they were also asked to describe the source of it. Furthermore, participants were asked about their present sleep habits, and their ability to focus and concentrate on daily routine tasks.

The post-process questionnaire included many of the same topics but participants were also asked to evaluate, what effect, if any, do they feel that the process of these sessions has had on the level of stress in their life, sleeping patterns, emotions, concentration/alertness, and general well-being. They were asked to describe any changes.

In the beginning of each session the participants answered a pre-session questionnaire and in the end of each session, they filled post-session questionnaires. Pre-session questions were the same as the pre-process questions. The post-session questions also included questions about any images experienced during the session.

During the process the music therapists conducting the treatment kept their session notes concerning the Physioacoustic programme used and its rationale, duration, music used, and general comments (i.e. how did the participant react during the treatment: bodily reactions, emotions, images, and discussion topics). The research was reviewed and accepted by the Wilfrid Laurier University Ethics Board.

Data Analysis

The research design of this study was based on qualitative (Denzin & Lincoln, 2000), abductive (Peirce, 1839-1914), and descriptive (Bruscia, 2005, p.81) paradigm. Phenomenology (Van Manen, 1997; Polkinghorne, 1989; Forinash & Grocke, 2005, p. 323; Forinash & Gonzalez, 1989) was used as main research method to analyze the experience of the participants and the outcome of the intervention.

A phenomenological approach allowed the researcher to focus on the richness of participants' experience and to seek to understand a situation from their own frame of reference – as experienced by them. The point of this phenomenological research was to borrow participants' experiences in order to understand the deeper meaning of it in the context of the low frequency intervention as a therapeutic tool (Van Manen, 1984 in Baler et al, 1992, p. 1357). The NVivo qualitative software analysis program was used for the text-analysis of the structured, qualitative questionnaires. Following Van Manen's phenomenological method (1997) the text was read several times and the statements that were particularly relevant for the phenomenon under investigation were identified and highlighted. These then became the beginning threads of the thematic analysis (Borkan, 1999). When the descriptive categories began to emerge, it became obvious that some of them have similarities with mindfulness theory (Langer, 1989).

The following sections introduce the results of the study. They are presented as descriptive and explorative categories, not as a multiple case study. This kind of holistic description "gives the what, when, where, and how, without the whys. It is concerned with discerning what constitutes the phenomenon"(Bruscia, 2005, p. 89). For the purpose of this article, they have been linked to mindfulness theory (Langer, 1989) and the findings that the cultivation of mindfulness can have a positive effect on well-being (Shapiro, Oman, Thoresen,

Plante and Flinders, 2008). One of the main studies regarding the effects of mindfulness cultivation on well-being was done in 2008 at Santa Clara University in California. Shapiro, Oman, Thoresen, Plante and Flinders found preliminary evidence that at least one aspect of mindfulness, measured by the Mindful Attention and Awareness Scale (MAAS; Brown & Ryan, 2003) results in positive outcomes regarding well-being (2008). Further analysis of this study resulted in increases in perceived stress and rumination (2008). It should be noted that it would be beyond the scope of this article to describe the entirety of this study in detail.

Results:

Low frequency sound intervention - increased well-being in daily life - physical and emotional relaxation

The results of this study show that low frequency sound treatment can have a positive effect for participants' overall well-being in their daily life: "...I feel it has increased my well-being. I experienced joy in the chair..." Increased well-being includes both physical and emotional relaxation. The descriptive categories created based on participants experiences focus on physical pain and tension, emotion enrichment, stress management, and concentration skills. The results show that pain and tension decreased, sense of peace, self-reflection, and clarity increased as well as focus and alertness.

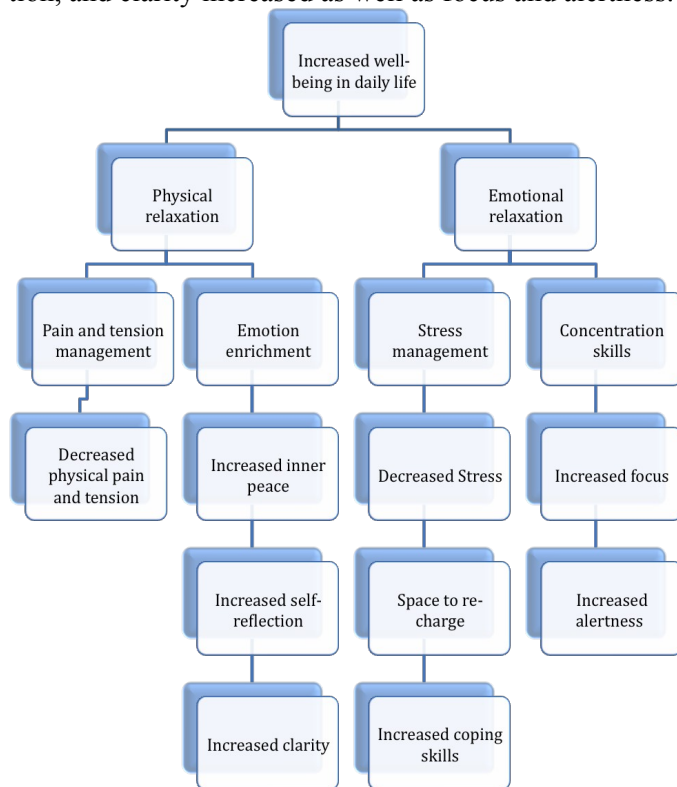


Diagram: Increased well-being in daily life

Pain and tension management

Decreased physical pain and tension

In the beginning of the treatment process all of the participants experienced some sort of physical issues typical for a music students or academics working with computers:

- Back pain and tension (n=6),*
- Tension in neck and shoulders (n=7),*
- Headaches (n=2),*
- Tight calve muscles (n=2),*
- Finger or hand tension (n=2),*

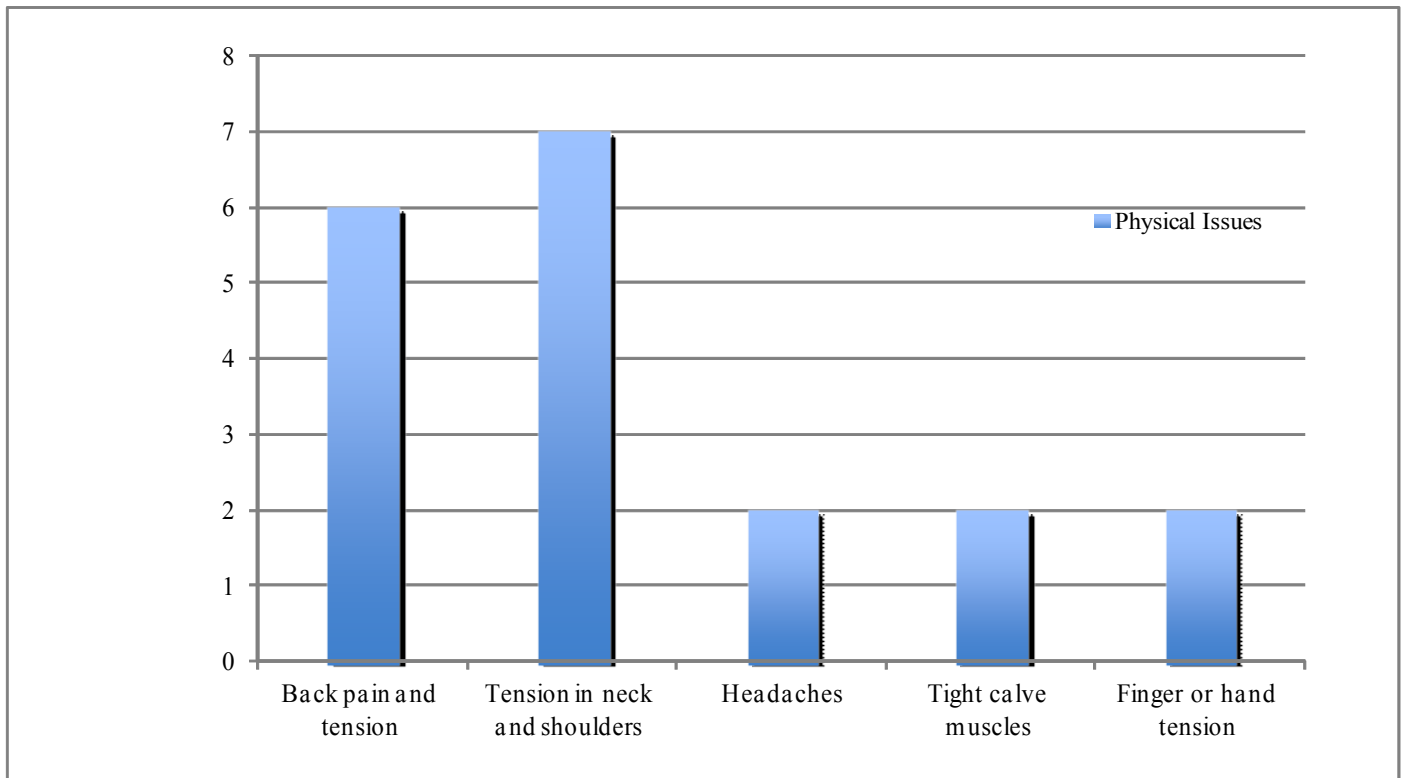


Chart: Beginning of treatment - pain and tension management

After the treatment process, no participant reported headaches, tight calve muscles, back pain or tension, nor tension in neck and shoulders. One participant still reported tension in wrist but that may be because s/he had been practicing days and nights for his/her violin audition. Participants reflected that they “felt more relaxed”, “extremely relaxed” and “more well rested.” One participant concluded: *“I see this as a positive experience. The back and lower back relaxation program is AMAZING and I feel more relaxed after each session.”* and *“to experience relaxation has been helpful...”*, *“I feel better/more relaxed physically after each session”*, and *“...increased my circulation, helped me relax and its’ nice to take a little down time during the day.”*

In 1986, Kabat-Zinn et al, did a four year follow-up study of a mindfulness-based program for the self-regulation of chronic pain and found that a meditation-based program had a positive effect on regulating pain. In 2007, McCracken made a similar finding confirming that mindfulness-based therapeutic treatments can lead to a decrease in chronic pain.

According to R  utel, et al., (2004) – participants noted that physical tensions disappeared and a total body relaxation occurred. Participants also commented that relaxation occurred physically and mentally, some participants even fell asleep during the VAT sessions. Similarly, Brodsky (2000) found that after professional orchestra musicians had Somatron treatments with music that there was an increased level of relaxation and a significant decrease of tension. After a VAT treatment, participants felt calmer and more relaxed (R  utel, Ratnik, Tamm, & Zilensk, 2004). Haas, et al., (2006), found that after using whole-body-vibration (WBV) there to be a 25% and 24% improvement in reducing tremor and rigidity scores with participants who had Parkinson’s disease. Low frequency treatment is a non-pharmacological form of coping for participants with Parkinson’s disease as it shows trends of activating the supplementary motor area (King, Almeida, & Ahonen, 2009; Haas,

et al., 2006). Lastly, low frequency treatments are known to help decrease pain (Zheng, et al., 2009; Karkkainen & Mitsui, 2006) muscle strain, stiffness (Karkkainen & Mitsui, 2006) and to evoke parasympathetic responses (Bergström-Isacsson, et al., 2007). Fishbein, Middlestadt, Ottati, Straus, & Ellis (1988) received over 2200 completed questionnaires from orchestral musicians to gain an understanding of musicians' common medical problems. The researchers gathered information on the musculoskeletal problems to name a few from: fingers, hand, wrist, elbow, shoulders, neck, upper, middle and lower back. Non-musculoskeletal problems included: eye strain, stage fright, anxiety, depression, ear problems, and sleep disturbances, to name a few (Fishbein, et al., 1988).

Emotion enrichment

Increased inner peace

The analysis of the feeling wheel proved that generally, the amount of participants' emotions increased and enriched during the treatment process and during each individual session. It was also obvious that tiredness and anxiety experienced in the beginning of sessions and in the beginning of the process decreased or disappeared by the end of the sessions and by the end of the process. For example, "*weight of responsibilities*" changed to a "*general state of calm*". One of the participants described that "*I feel the sessions have put me in a more relaxed state, and therefore I feel calmer and more positive overall.*" Tiredness decreased, and feelings such as content, relaxed, confident, valuable, worthwhile, hopeful increased.

Another example occurred at the beginning of the treatment where a participant indicated feeling: helplessness, overwhelmed, anxious, and the need to be strong. After the treatment process the emotions had changed dramatically to relaxed, clear in thinking, serene, thankful, confident, valuable, optimistic, amused, stimulating content, loving, nurturing, faithful, appreciated, hopeful, cheerful, energetic, peaceful, powerful, and joyful. In the beginning of another participant's process he or she felt: tired, trusting, important, appreciated, aware, submissive, pensive, valuable, stressed and nervous. In the end, there were: feeling positive about my chances of getting all the work done, relaxed, pensive, confident, optimistic, creative, hopeful, content, and thoughtful. A large body of mindfulness research focuses on the positive effect mindfulness has on increasing and sustaining "positive" emotional states. For example, Fredrickson (2008) found that the cultivation of mindfulness led to an increase in purpose in life. Brown (2009) discovered that mindfulness can promote the perception of "having enough," in regard to subjective well-being and financial desire.

In a research study with adolescent girls who experienced high levels of anxiety, Rützel, et al (2004), found that following VAT treatment participants expressed feeling relaxation, a sense of relief and peacefulness. Furthermore, the girl's emotions changed so that participants felt "in a better mood, openness and self-confident in their relations" (Rützel, Ratnik, Tamm, Zilensk, 2004, p. 41). Physioacoustic therapy treatments had similar findings of decreasing anxiety, depression and helping participants have a restful sleep (Karkkainen & Mitsui, 2006).

Increased self-reflection and awareness

It was also obvious that self-reflection increased as the treatment allowed time and space to observe, recognize, and explore one's own feelings. For example, one participant felt in the beginning of the treatment process distance, slow, tired, thankful, hopeful, and aware but in the end of the process s/he felt feelings of peaceful, thoughtful, isolated, relaxed, confident, and successful. The participant realized s/he felt isolated which was an important self-reflection.

Coping with feelings increased: "*Everything feels more manageable so I feel relaxed and content most of the time?*" "*It has helped me focus on more productive emotions... I noticed that I normally didn't feel so many conflicting emotions after a session.*" According to Maslow (1971), the third road that leads to self actualization is self-awareness. Self-awareness means to become more aware of how we respond to the outside

world. Ellen Langer (1989) suggests that the experience of mindfulness stresses process over outcome, which can result in an increased sense of creativity and intuition regarding new information and perspectives about one's life situation.

When working with adolescent girls who had anxiety, Rüütel, et al., (2004) found that using VAT created a space for self-reflection and to have self-acceptance (Rüütel, Ratnik, Tamm, & Zilensk, 2004). VAT was reinforced with participants drawing self-portraits, thus, increasing self-reflection. Participants found the physioacoustic chair brought awareness to one's physical body and sensations. It had calming, relaxing effects as well as highlighted the importance of rest, relaxation, and feeling comfortable (ibid).

Increased clarity

Many participants stated that the experience had added their clarity of thinking, for example: *"I feel relaxed as well as clear in thinking"* or *"I became more aware of the emotions I was feeling... having to write my feelings down and then look at them in end of the sessions, surprised me...?"* The feeling wheel analysis proves that emotions clarified. For example, in the beginning of the treatment process one participant experienced following emotions: optimism, confused, successful, peaceful, and inadequate. In the end of the process s/he felt serene, relaxed, contained, and peaceful. S/he didn't feel confused or inadequate any more.

"I definitely experience clarity after my sessions. I feel like prior to the chair, my thoughts are scattered and I am usually stressed. After sitting in the chair, I experience a clear mind. The effects of the chair are really amazing. Because I have listened to the same music at home to try to relax, and I do not experience the clarity that I experience in the chair."

"During a very stressful time with my relative's health issues, it gave me a way to cope, relax, and become clearer in my thinking – a way to process my thoughts, concerns, with a relaxed mind."

According to Bishop et al (2004), the psychological experience of mindfulness can be described as nonjudgmental, present-centred awareness, which can be perceived as a state of heightened clarity.

According to Rüütel, et al (2004), these girls found that spending time in the VA opened a space for participants to self-reflect and begin to work through their problems. Brodsky (2000) found that participants had a significant decrease in confusion following Somatron treatments with music. Physioacoustic treatments are known to help "empty their head of all thoughts" (Karkkainen & Mitsui, 2006, p. 158).

Stress management

Decreased stress

Every participant experienced some level of stress due to a school work (assignments, auditions, finishing up the semester, scheduling), family/relationship issues (sickness, death), future plans (financial issues, looking for work/starting a career, insecurity):

No stress (n=0),

Little bit stress (n=0),

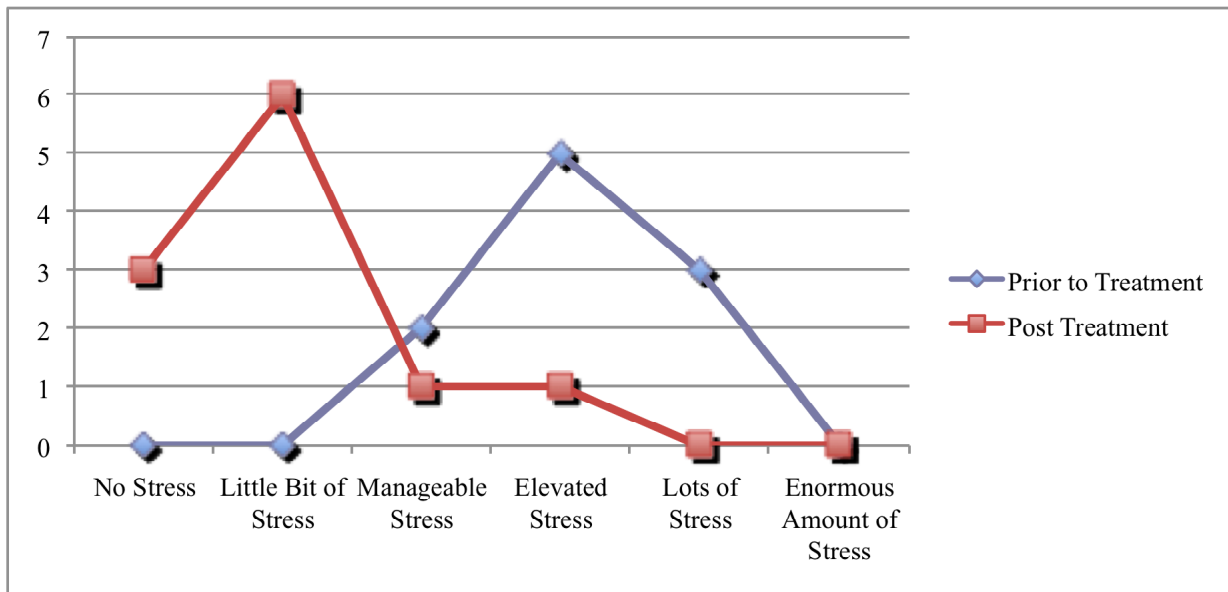
Manageable stress level (n=2),

Elevated stress level (n=5),

Lots of stress (n=3), and

Enormous amount of stress (n=0).

After the treatment, participants experienced: "No stress" (n=3) (by one participant who had "manageable stress level" and two participants who experienced "lots of stress"), "Little bit of stress" (n=6) (by one participant who experienced "lots of stress", and by one participant who experienced "manageable stress level", and by four participants who experienced "elevated stress level"), "Manageable stress level" (n=1) by a participant who had experienced "elevated stress level", "Lots of stress" (n=0), and "Enormous amount of stress" (n=0)



Results: pain and tension management

According to Kabat-Zinn's (1992) Mindfulness-based stress reduction model, mindfulness has been clinically proven to be effective in treating the stress-related aspects of depression and anxiety. Brown (2003) and Garland (2009) found that mindfulness interventions resulted in declines in mood disturbance and stress. The use of vibroacoustic therapy (VAT) was essential in releasing tension amongst adolescent girls with high levels of stress (Rüütel, Ratnik, Tamm, & Zilensk, 2004). Brodsky (2000) found that participants experienced a significant decrease in negative affect (depression, tension, and anger) following treatments of Somatron and music (Brodsky, 2000).

Space to re-charge

According to the participants, the low-frequency treatment provided a therapeutic space for self-care, relaxation, and re-charging:

"I feel my stress has been somewhat reduced simply from having the opportunity to sit, relax, and allow myself to be worry-free, tune into myself."

"It's helpful to have this time to sit and stare out the window and relax.... I realize the value of taking time out to relax..."

"I see this time as a time for myself and I've come to look forward to these sessions... Just because I knew these were going to be relaxing. I think I build the rest of my week around this time."

"I feel like it gave me a break from thinking about what I needed to do. It offered a space to relax and re-charge..."

"I see this as a time for myself..."

"...I have been reminded of the value of taking time for myself, which is certainly a beneficial thing."

"Taking time out to sit with feet up is helpful to incorporate all actions of the day."

Some mindfulness-based research has shown a relationship between progressive relaxation and the cultivation of mindfulness. For example, Murphy has used Mindfulness Meditation and Progressive Relaxation Training in tandem within his research due to this correlation (Murphy, 1995). These responses are similar to feeling heightened awareness following live improvised music and correspond with Maslow's self-actualization theory (Ahonen & Houde, 2009). Participants remarked having feelings of "letting go", "floating in

music” as well as having visualizations, increased self-awareness and opportunities to connect with oneself (ibid). Maslow (1968) found that peak experiences are moments “of great wonder, feelings of oneness with the universe, moments of seeing the definitive truth, and the ultimate fulfillment of self-actualization” (Ahonen & Houde, 2009).

Increased coping skills

During the treatment, participants reported that their overall stress, coping skills, and management increased:

“I feel that each session has helped reduced the dealing of stress in my life. The music and the vibrations of the chair gave me some time to relax and everything (the feelings of relaxation) was amplified by the chair”

“After the session, I felt calmer and a sense of clarity arose. Therefore, I felt more able to cope with my stress and the stress felt more manageable”

“I think it has simply forced me to be calm on a more regular basis, and this has reduced my stress level. I feel more in-tune with myself”

“If the stress was work related it gave me a clearer picture of a better ways to cope.”

“...clearer picture of the stress and possible ways to change”

“I think I have fairly good coping skills, but its easy to forget to sit and just do nothing but relax for yourself once and awhile... these scheduled visits helped a lot in that.”

“I think I’ve had reduced stress.... I think everything seems a little bit more manageable”

“I think that these physioacoustic sessions almost provided some space and cut back on the less productive thoughts and worries”

“... these sessions... gave me space to get away from stress so I could deal with it better.”

“I think that these sessions helped with the ability to cope with stress because it provided the time for me to just sit for an extended period of time and relax”

“Able to sort thoughts in chair (weed out thoughts contributing my stress...)”

“...re-evaluate the way I think or view and process and thoughts or release them: “I am aware what triggers the stress”

Due to the various physiological changes that occur when one is coping with stressors, Arch (2006) found that mindful, focused breathing led to positive results regarding ones ability to cope with emotional stress. VAT was found to be a means of coping with stress and participants had variety of techniques and ideas to cope with anxiety in the future (Rütel, Ratnik, Tamm, & Zilensk, 2004). All these experiences were a means of heightening self-awareness and a time of “balancing self-discovery” (ibid).

Increased concentration

According to the participants, the treatment helped them to concentrate better in their work and studies right after the treatment. For example: *“Mornings usually are my best waking time to get things done but I noticed after these sessions, the afternoon became very profitable.”* According to Maslow (1971) concentration leads to self-actualization: “...self-actualization means experiencing fully, vividly, selflessly, with full concentration and total absorption” (Maslow, 1971, p. 45). The research data showed several examples of moments of increased concentration, focus and alertness. Bishop, et al, (2004) suggests that mindfulness regulates attention in order to bring a quality of non-elaborative awareness to one’s current experience, which can result in the experience of relating more acutely to the subtle qualities of the current moment (Bishop et al., 2004, p. 234). After participants received low frequency treatments, an increase in concentration and an improvement in motor control of lower and upper extremities occurred (Haas, et al., 2006). This allowed participants with Parkinson’s disease to complete tasks with greater balance, accuracy and speed (ibid).

Increased focus

Results show that most of the participants felt low frequency treatment increased their general capacity to focus. *“I feel that generally afterwards I feel like my eye sight is clearer and I feel overall lighter and focused on what I have to do. I don’t know how long this feeling lasts, but I generally notice it immediately after the session”* And, according to another participant: *“There are many factors acting on my ability to focus. Being less stressed I feel, has improved my concentration level, although this could also be because the term is coming to a close.”*

Bishop, et al, (2004) describes the experience of mindfulness as the process of gaining insight into the nature of one’s mind and the adoption of a de-centered perspective, which can lead to a more focused sense of the subjectivity of one’s discursive thoughts and a clearer sense of what is of truly important (Bishop et al., 2004, p. 234). After having vibroacoustic sessions, there was a decrease in self-injurious behaviour as well as stereotypical behaviour in participants with Autism Spectrum disorder which suggests an increase in focus (Lundqvist, Andersson, & Viding, 2009).

Increased alertness

“I notice a distinct increase in my alertness when in chair and after.” However, *“sometimes I felt less alert after being in the chair because it made me sleep, and other times I felt more alert after having the time to relax.”* Stanley (2009) suggests, in relation to Mindfulness-based Mind Fitness Training, that the ability to sustain focus and filter out distractions in a continuous and ongoing way supports vigilance and alertness (Stanley et al, 2009).

After the VAT treatment, some participants felt more energetic, as well as raised self-knowledge and self-organization. Furthermore, adolescents became more aware of their surroundings, their physical body and mental awareness (Ruutel, et al., 2004). Similarly, after Somatron treatments with music, some orchestra musicians became aware of their physical body and felt alert (Brodsky, 2000). King, et al., (2009), speculate that the vibrations stimulate a “greater ability to sense the position, location, and orientation of the body” (King, et al., 2009, p. 304). Thus, suggesting the improvement for speed and coordination of the body (Bergström-Isacsson, et al., 2007).

Discussion and Conclusion

The results of this study clearly show that low frequency sound treatment can have a positive effect for participants’ overall well-being in their daily life as the treatment increased participants’ well-being by relaxing them both physically and emotionally. The descriptive categories on physical pain and tension, emotion enrichment, stress management, and concentration skills, clearly show that pain and tension decreased, sense of peace, self-reflection, and clarity increased as well as focus and alertness. It seems that the low frequency treatment can be an effective mindfulness practice.

The results of this study show that the physioacoustic low frequency treatment allows participants to increase their well-being through physical and emotional relaxation and therefore increase their working capacity and enjoyment of their daily life. Furthermore, these treatments allowed a person to recharge and decrease their feelings of stress, suggesting that low frequency treatments could be a healthy option in coping with stress and increasing a person’s well-being. The study served as a pilot, to confirm stakeholder interest on low frequency treatment with people experiencing stress, and to inform the feasibility of a larger study.

Many research participants stated that they would have benefited in having more sessions and more frequently. *“I believe the sessions have a positive effect on my well-being. I would have liked to be in the chair for a longer period of time and to do the sessions more frequently.”* *“I usually have a session in the morning and I feel I start the day ‘on the right foot’ ”. Therefore, the effects of the session affects part of my day... If I had*

daily sessions, then the effect would carry into my everyday life.” Further research should address the long-term effects of low frequency sound treatment. An RCT study would be beneficial.

⁴ A group of Finnish experts spent twenty years developing the *Physioacoustic Sound Wave Therapy System* for therapeutic purposes. The computer creates and controls low-frequency sinusoidal sound waves, which are broadcast through the chair's speakers. The person sitting on the chair feels relaxation or massage as sympathetic resonance within muscles and other tissues. The physioacoustic chair is a piece of medically approved equipment (by the FDA in the USA and the BSI in the UK) for a wide range of medical conditions and sports injuries. Similar in concept to the high frequency sound waves used in ultrasound treatment, physioacoustic sound wave therapy has three medical claims: (1) improving blood circulation, (2) reducing pain, and (3) relaxing muscles. The American Physical Therapy Association (APTA) has named the treatment as Physioacoustic Massage. It has a code and has been registered as Next Wave Chair TM, medically approved and is classified as II (low risk, non invasive).

5. The “feeling wheel” (developed by Dr. Gloria Willcox. St. Petersburg, Florida, USA) includes 78 different feelings.

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