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Contemporary Vibroacoustic Therapy: Perspectives on Clinical Practice, Research, and Training

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Abstract

Vibroacoustic therapy (VAT), traditionally considered to be a physical and receptive type of music therapy intervention, uses pulsed, sinusoidal, low-frequency sound on a specially designed bed or chair. Today VAT is viewed as a multimodal approach, whereby the therapist works with the client's physiological and psychological experiences, incorporating a mind–body approach. This article provides current knowledge in clinical practice emphasizing the systematic and documented implementations of VAT. This includes presentation and explication of the key elements of VAT, assessments, treatment plans and procedures, documentation, and evaluation of the treatment with recommendations for follow-up care in health and rehabilitation. Recent research is presented, and directions for future research are considered. Applicable views on clinical training and required competencies are outlined.

Keywords

vibroacoustic therapy, clinical practice, research, training

Introduction

The basic idea of vibroacoustic therapy (VAT) was developed by Olav Skille and Juliette Alvin in 1968, in an attempt to envision a possible development of the theory and practice of VAT treatment within a traditional music therapy model. In 1982, Skille defined VAT as the use of sinusoidal, low-frequency (30-120 Hz), rhythmical sound–pressure waves mixed with music for therapeutic purposes. Skille noted that VATs "low-frequency sound massage" would assist in the reduction of pain and other stress-related symptoms.[1] In current times, low-frequency sound vibration therapy is one application of music therapy practiced worldwide, although in actuality is used only by a minority of music therapy practitioners. Physical therapists, psychotherapists, psychologists, nurses, medical doctors, and other health care professionals who have clinical training for the use of VAT may also be trained to use it. Other pioneers in the field of VAT are Tony Wigram, Petri Lehikoinen, Saima Tamm, Riina Raudsik, and Eha Rüütel. Tony Wigram's first VAT programs were a mixture of music and low-frequency sound, which he named "vibroacoustic music" (VAM). Skille refined the concept of VAT to the use of one, amplitude modulated, sinusoidal sound.[2] In best clinical practice, VAT is a combination of low-frequency sound vibration, music listening combined with therapeutic interaction. With this combination, it is possible to address a client's emotional, cognitive, and social problems, alongside bodily functions and sensations.[3]

The VAT's use of low-frequency, sinusoidal sound is based on the premise that sound as a mechanical wave travels through a medium that transports energy from one location to another.[4] By low-frequency sound it is implied that the sound vibrates between 20 and 100 Hz (20-100 times per second).[5] Sinusoidal sound is the simplest sound information representing a single frequency with no harmonics.[6] Varying hypotheses and assumptions have been made about the effect mechanisms of VAT. The most interesting thus far include the following:

1. The relaxation response[7]: low-frequency, sinusoidal sound causes resonance (oscillation) in our body and this seems to be the main effective aspect of VAT. Every object has its natural frequency and when the forcing function's (in this case VAT) frequency matches the natural frequency of an object (eg, thigh muscle), it will begin to resonate.[5] Resonance in our body will increase the circulation of blood and enhance our metabolism.[8] It will also release tension in muscles and resonate with affected body parts.[8] One additional aspect related to the relaxation response is the possible

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activation of oxytocin production[9] through VAT. A state of deep relaxation is the most common subjective experience reported by clients and patients after the VAT.

2. Pacinian corpuscle—neuronal inhibition of pain: Chesky and Michel[10] theorized that there could be beneficial uses of VAT resulting from the stimulation of the Pacinian corpuscles, which are large mechanoreceptors located in the subcutaneous and connective tissues surrounding visceral organs and joints. Pacinian corpuscles are sensitive to pressure and can react to VAT stimulation from 60 Hz upward. When the Pacinian corpuscle is stimulated, it sends neurological nonpain messages to the brain that appear to inhibit the pain impulse. Nonpain messages can be understood here through the gate control theory of pain.[11] According to the gate control theory of pain by pioneers Melzack and Wall, A-β nerve fibers, which transmit information from vibration receptors (Pacinian corpuscles and Meissner corpuscles) and touch receptors in the skin, stimulate inhibitory interneurons in the spinal cord that in turn act to reduce the amount of pain signal transmitted by A-∂ and C fibers from the skin to second-order neurons that cross the midline of the spinal cord and then ascend to the brain.[11,12]
3. Cellular cleansing mechanisms of sound vibration—the Jindrak postulate[13]: the Jindrak postulate theorizes about the possible mechanical cleaning effect of vibration in our body and brain. According to Jindrak and Jindrak, vibration can assist in removing some of the molecules, which are waste products resulting from activity in the nerve cells, through a diffusion process.[13]

These presented theoretical speculations have yet to be fully confirmed through research. However, it is important to realize that VAT is a multimodal approach, which reaches the whole client and strengthens the mind–body connection, yet makes it more difficult to investigate. Yet, this approach does provide the means that enable one to intervene with the client's physiological and psychological experiences at the same time in a flexible way.[14]

The VAT has been used with various client groups and has been the basis for a variety of technical devices that have been developed in Norway, Finland, and the United States.[15] On the basis of clinical experience and case reports, the most promising areas for the use of VAT seem to be applications for muscle tension and spasticity, acute and chronic pain (eg, tension neck, menstrual pain, fibromyalgia), and psychosomatic and stress-related symptoms (eg, high physiological arousal, mood disorders, insomnia). The most well-known devices today are the Norwegian Multivib (mattress, cushion), the Finnish Nextwave (physioacoustic chair), and the American Somatron (multiple devices).

Research of VAT

Anecdotal reports and case study results on the effects of VAT are numerous, but there is less evidence and research results involving larger scale studies. The effects and benefits of VAT have been originally linked to high muscle tone and spasticity.[16-18] For example in Wigram's[17] study with handicapped adults (n = 10) the outcome showed that VAT and sedative music together caused a significantly greater reduction in muscle tone and greater improvement in movement range than sedative music alone. In another study (n = 27) by Wigram,[18] it was found that VAT improved handicapped patients' range of movement almost as effectively as movement-based physiotherapy. A more recent study about the effectiveness of VAT on spasticity and motor performance was conducted by Katusic and Mejaski-Bosnjak.[19] The goal of this study was to evaluate the effects of vibrotactile stimulation on the spasticity and motor performance in children with cerebral injury. Thirteen children who were classified with spastic cerebral palsy participated in this study. The intervention was 20 minutes of 40 Hz vibrotactile stimuli once a week for a period of 3 months. The assessment of motor performance and the classification of the lower extremities functions were done before and after the intervention. This study showed that participants' motor performance (facilitation of rotations, better postural trunk stability, head control, and greater selectivity of movements) improved significantly.

The VAT has been reported to be effective as well in pain reduction.[10,16,20-24] Chesky and Michel[10] studied VAT with patients having rheumatoid arthritis. Participants (n = 27) received 3 different interventions: music alone, music and vibration combined, and a placebo. The perception of pain reduction measured through the Visual Analogue Scale (VAS) was significantly higher in the music and vibration intervention than in the music alone or the placebo interventions. The total percentage of pain reduction for music and vibration was 64%, music alone 24%, and placebo 2%. In Burke's[22] randomized study on pain management of postoperative gynecological patients (n = 32), it was found that intensive use of VAT postoperatively had a significant effect on pain reduction, reduced the need for narcotics, and decreased emotions of anxiety, hostility, and depression when compared with the experimental group and the control group. Recently, Staud et al[25] found in their study that vibrotactile stimulation effectively recruited analgesic mechanisms not only in normal pain-free controls but also in patients with chronic musculoskeletal pain, including fibromyalgia.

One interesting area of VAT is Parkinson disease. It is reported that the 19th century neurologist Jean-Martin Charcot used a vibration chair for patients with Parkinson disease. Charcot used vibration therapy for 30 minutes daily to treat his Parkinsonian patients on an ongoing basis. He reported improvements, but he died shortly thereafter and a more complete evaluation of his findings was never completed.

Del Campo San Vincente et al[26] investigated the effects of VAM on idiopathic Parkinson disease in a single-blind, randomized study. Participants (n = 60) were randomly divided into 2 groups of 30 participants each. The experimental group received music and a pulsed, sinusoidal low-frequency vibration and the control group received music only. Both groups received 25 sessions over 9 months. A comparison of the

participants' scores in Unified Parkinson's Disease Rating Scale (UPDRS) revealed no significant differences between experimental and control groups. However, researchers observed that participants receiving VAT improved UPDRS scores between the first and fourth assessments.[26]

King et al[27] studied the short-term effects of VAT on motor impairments in Parkinson disease. Forty individuals diagnosed with idiopathic Parkinson disease participated in this parallel crossover design study. Participants were subdivided into groups according to primary symptoms so that there were 20 slow/rigid dominant participants and 20 tremor-dominant participants. Participants were divided into 2 groups (A and B), and the difference in procedure between the groups was the order of the vibration treatment and control (rest) period. All participants were assessed at baseline, after vibration treatment, and after the control period. Assessment was carried out using the UPDRS, quantitative gait assessments, and with the use of a grooved pegboard for upper limb control. As a result VAT caused significant short-term improvements in symptoms of rigidity, tremor, and bradykinesia in both groups when compared to the control (rest) period. In group B, there was also a significant increase in the step length in the postvibration assessment. This study reveals interesting and promising results concerning the positive effects of VAT for the treatment of symptoms of Parkinson disease. Unfortunately, the length of the intervention and frequencies used are not clearly defined in the study, which makes it impossible to evaluate the relevance of stimuli-based interventions on clinical experience with patients having Parkinson disease.

More recent studies of VAT have also been focused on the effects of low-frequency sound on challenging behavior,[28] functional capacity, blood circulation, and bone metabolism in frail older adults,[8] and on the control functions of the autonomic system in people with Rett syndrome (RTT).[29]

In randomized controlled trial of Lundqvist et al,[28] experimental tests were carried out to investigate whether VAM had an effect on self-injurious, stereotypical, and aggressive destructive behavior in participants with autism spectrum disorders (ASDs) and developmental disabilities. Twenty participants were randomly assigned to 1 of 2 groups. The first group received ten 10- to 20-minute sessions of VAM over a period of 5 weeks. The second group then received the same intervention. Behavior was assessed by the Behavior Problem Inventory in all participants on 3 occasions: (1) at the beginning of the study, (2) after the first group of participants had completed their treatment, and (3) after the second group of participants had completed their treatment. The major finding of the study was that VAM reduced challenging behavior in individuals with ASD and developmental disability. The results of this study are quite promising and confirm findings of earlier case studies related to challenging behavior.[30] Unfortunately, the stimuli used are not well defined. The authors stated that the low-frequency vibrations used varied between 30 and 80 Hz and lasted for 10 to 20 minutes in each session. Based on this information, it is not possible to evaluate the clinical relevance of the low-frequency stimuli used.

The Zheng et al[8] study is thus far the most innovative and clinically relevant investigation in the field of VAT. In this single-blind, randomized, controlled trial, the objective was to evaluate the effects of a low-frequency sound wave therapy program on functional capacity, blood circulation, and bone metabolism of the frail elderly individuals. Forty-nine volunteers (14 males and 35 females) aged 62 to 93 years with up to 12 diagnosed diseases were allocated in either the intervention group (n = 30) or control group (n = 19). The intervention group underwent sound wave therapy, 3 to 5 times a week for 30 minutes per session over a period of 6 months. The control group received no intervention. The main measurements taken in the study were blood pressure, functional capacity, mobility, bone density, biochemical markers, isometric muscle strength, balance, and skin surface temperature. Compared with the control group, the intervention group's mobility and the amount of self-reported kilometers walked per week increased by 3 km ($P < .05$), while the levels of cholesterol (4.97 [0.72] to 4.52 [0.65] mmol/L, $P = .019$), low-density lipoprotein (2.82 [0.72] to 2.45 [0.61] mmol/L, $P = .022$), bone markers of total osteocalcin (11.0 [6.5] to 10.3 [5.9] ng/mL, $P = .048$), and tartrate-resistant acid phosphatase isoform 5b (2.50 [1.0] to 2.41 [1.1] IU/L, $P = .021$) decreased. The average skin surface temperature was significantly higher during active sessions at the end of the intervention than at the beginning ($P = .004$). No change was found during the placebo sessions. Zheng et al concludes that VAT may have the potential to promote well-being in frail elderly participants via improved functional capacity, especially in participants who are too frail to undertake exercise. Very important in this study was the fact that the intervention was intensive and the duration was long enough to have impact, and that succinct measurement tools were utilized. Unfortunately, the dropout rate was high; therefore, the outcome analyses present a challenge.

In Bergström-Isacsson's[29] study, the aim was to examine what effect musical and vibroacoustic stimuli had on the control functions of the autonomic nervous system, and on cortical emotional reactions, in participants with RTT. There were 35 participants with RTT and 11 children with normal development. A repeated measures design was used, and physiological data were collected from a neurophysiological brain stem assessment (NeuroScope). The NeuroScope makes it possible to observe on a monitor screen the intensity of the communication between the heart and the brain in real time.[31] The control situation was the physiological baseline of the participant's own autonomic function at rest. After establishing a baseline, the participants were exposed to 6 musical stimuli. The horn was chosen to elicit an arousal response and activate (parents' choice) a sympathetic response. Calming (parents' choice), VT (vibroacoustic stimulation), VT + Mu (VT combined with calming music), and Mu (that same music without vibrations) were expected to elicit a parasympathetic response. The continuous dependent variables measured were cardiac vagal tone, cardiac sensitivity to baroflex, and mean arterial blood pressure. These parameters were used to categorize brain stem responses as parasympathetic (calming) response,

sympathetic (activating) response, arousal (alerting) response, and unclear response. As a result, continuous responses showed that calming and VT increased cardiac vagal tone significantly in the RTT group. In the RTT group, the expected categorical responses related to the hypotheses were observed in 7% for horn, 36% for activating, 39% for calming, 52% for VT, 32% for VT + Mu, and 28% for Mu.

As we synthesize and evaluate the studies of VAT, we can easily recognize that there is still, after 30 years, a huge need for both basic research related to the effect of low-frequency sound vibration on the human body and mind, as well as more carefully planned applied studies of VAT for the most promising client groups. Clinical experiences and anecdotal knowledge shows that several conditions can be found where VAT seems to offer remarkable benefits.[14] These clinical target groups would be, for example, fibromyalgia patients, people with stress-related symptoms such as insomnia and women with menstrual pain and/or menopause symptoms. Such symptoms have been treated successfully by using VAT, but large-scale, well-designed, and carefully conducted studies are still missing. The aforementioned symptoms incur expenses on our society through the cost of pharmacologic agents, as well as decrease work efficiency and incur the incidence of sick leave, and additionally invoke individual suffering and a decrease in the quality of life for many.

The typical deficit within most of the studies relate to the design of the study, the low number of participants, and poorly described intervention which is not based on the best clinical practice, and the problem of finding applicable and sufficiently sensitive enough measurement tools. In future research we should rely more on the best clinical practice of VAT, and study the effects of the most relevant clinical interventions and procedures of VAT with clinical groups that seem to benefit most from this particular intervention. Special attention should be given also to the measurement tools used in VAT studies. As the experiences from Seinäjoki Central Hospital reflect, the long-term systematic use of VAT may provide great opportunities for both developing the intervention itself, and for collecting clinical data within the everyday clinical work without a significant increase in workload.[32,33]

Part II—Contemporary Vibroacoustic Therapy: Training and Application in Clinical Practice

Since 2003, we have systematically collected information and knowledge about using VAT in a variety of clinical contexts, and based on this background data, we have further developed and refined the best clinical practice of VAT. The main aim has been developing and supporting the systematic and well-documented use of VAT. This includes the understanding of the key elements of VAT, assessments, treatment plans and procedures, documentation, evaluation of the treatment and further, assists in establishing recommendations for follow-up treatment.

The Role of Low-Frequency Sound Vibration

Low-frequency, sinusoidal sound vibration is the core element of VAT. Basically, it can be used for either relaxation or activation. The main parameters that guide the intervention are the length of sound pulsation, the volume, and scanning of the sound. Slow pulsation is used for relaxation and faster pulsation for activation. Typically, the first aim is to help the client calm and reach a state of deep relaxation. The hyperaroused and stressful state of the client can best be calmed with the implementation of treatment programs that have slow-paced and peaceful pulsations and fairly gentle vibrations. The perception of the volume is subjective and should always be adjusted individually. If the volume of the sound is too strong it can cause side effects such as nausea, disorientation, and change in the sense of equilibrium. Scanning of the sound changes the frequency of that sound in a specified range. This allows the therapist a means to evaluate the identification of an ideal sound frequency to resonate with the affected area of the body. Each time a muscle resonates with a sound stimulus, it will deepen the relaxation of the muscle. When combined, these adjustable sound parameters provide diverse possibilities in designing and editing treatment programs to meet individual therapeutic needs.

The Role of Music

If a decision is made to use music as a part of VAT, it is important to define the meaning, context, and function of how the music will be used. The role of the music in VAT can be entertaining, relaxing, or activating in nature.[3] In many cases and especially at the beginning of the treatment process, the entertaining and relaxing aspects of music are most accessible. The main objectives at this preliminary stage are to increase the client's feelings of relaxation and safety through orientation. At the beginning of the therapy process, it is quite common to use the client's favorite music, which seems to reduce anxiety and helps to create a therapeutic alliance between the client and therapist. The client's favorite music has also been found to be the most effective when music has been used for pain relief.[34] In the psychotherapeutically oriented approach of VAT,[35] the role of music can be both relaxing and activating. In such cases, it is important that the therapist sensitively assesses the client's ability to integrate music that activates strong emotions, images, and memories or when there is a need to use music that calms the client and helps to soothe and relax.[36] Finally, it is important to note that at times music can be disturbing, and in these cases it is better not to use music as a part of VAT treatment.

The Role of Therapist

The role of the therapist in VAT is multifaceted. In the beginning of the therapy process, the therapist is actively creating therapeutic conditions where safety and trust can develop. The therapist contributes to the formation of the alliance and mutual interaction. The first task is to describe to a client the basics of the treatment procedure and the methods used in VAT. This

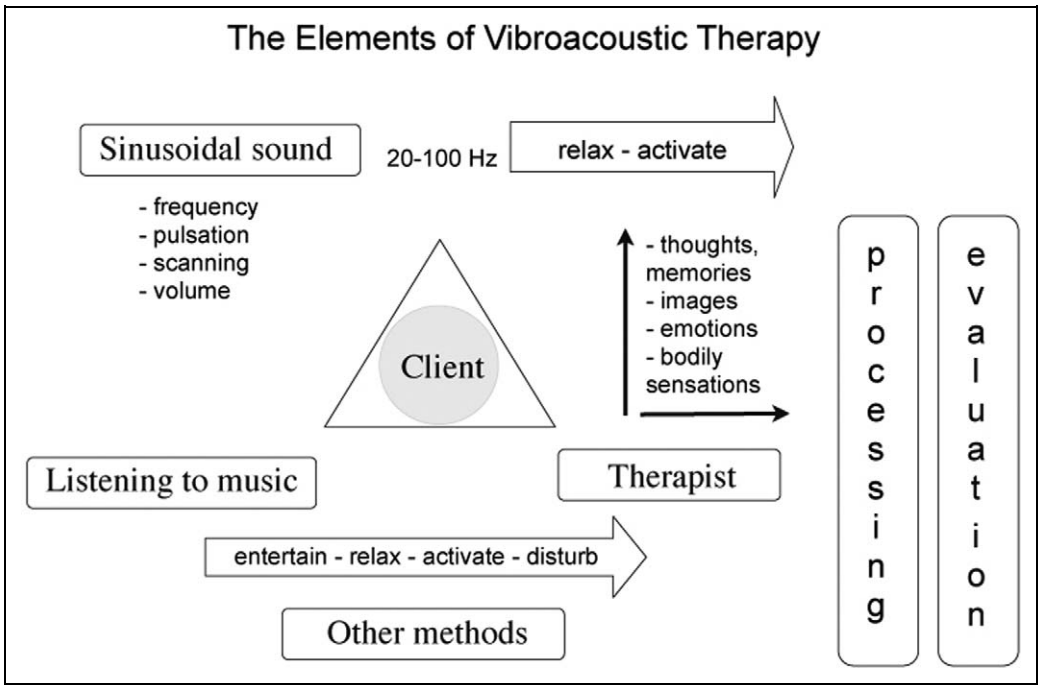

Figure 1. Key elements of vibroacoustic therapy

will reduce the client's potential anxiety to a new and unfamiliar situation and will strengthen adherence to the treatment. The therapist encourages the client to engage in reflection and share emerging experiences by acknowledging a potential variety of experiences or levels. The areas of experiences which may be accessed include thoughts and memories (cognitive level), images (symbolic level), emotions (emotional level), and bodily sensations (sensorimotor level). Conducting the therapeutic discussion on these levels enables the development of an individually tailored and meaningful therapeutic process, along with the evaluation of the physical, emotional, and cognitive areas of experience. Additionally, the therapist helps the client to integrate these experiences and insights into current life situations and personal history as well.[3] There are client groups (eg, autistic, mental retardation) and situations when discussion is not possible and in those cases the therapist needs to rely on observations and feedback from nursing staff. We have noticed that the therapist's behavior in the treatment session strongly affects the client. For this reason, it is important that the therapist is familiar with the technical aspects of the VAT to be able to fully concentrate on the interaction with the client. The therapist actively regulates his or her own behavior so that it is well suited to the individual needs of a client and remains in line with the therapeutic goals and objectives.

The key elements of VAT are illustrated in Figure 1. In the center, the focus is drawn to the client because it is important to actively engage the client in the therapy process as he or she presents as the most vital source of information, particularly when designing and developing the treatment procedures. The main elements of VAT are the effect of sinusoidal sound, the effect of music, and the effect of the therapist. Depending on the therapist's experience and qualifications, other therapeutic approaches may be combined with the VAT.

Assessment and Treatment Plan

The treatment strategy is based on assessment. During the assessment we can effectively implement a variety of standardized assessment tools (eg, Beck Depression Inventory [BDI], the anxiety part of the Hospital Anxiety and Depression Scale [HADS-A], the health-related quality of life survey [RAND-36], and questionnaire for clinical outcomes in routine evaluation [CORE]). A full qualitative interview is recommended as well. With the assessment, we are able to set goals for the treatment and develop a treatment plan. In the treatment plan, we should make decisions about the treatment strategy and procedure. This includes the length of the entire therapy process including the number of agreed-upon sessions, the duration and content of one therapy session (defining different kinds of combinations of sound stimuli, music listening, verbal discussion, and other possible methods), and the intensity of the treatment (how many sessions per week or per day).

Treatment Strategies and Procedures

There are some basic points that we have found to be essential to consider in setting treatment strategies and procedures in VAT. First, the chosen treatment strategy and procedure should meet the client's individual needs and current condition. Creating a peaceful environment that helps the client to be able to calm initially before settling into the treatment mode is mandatory. The duration of the therapy session is dependent upon the chosen treatment strategy. In the beginning, it might be rather

short—10 minutes, for example, particularly if the client is not able to concentrate for longer periods, but little by little it is possible to increase the length of the session. A typical VAT session lasts from 45 to 60 minutes and includes verbal discussion before the sound stimuli and reflective discussion after the experience (ie, thoughts and memories, images, emotions, and bodily sensations), which occur once the sound stimuli has ended. The intensity of the treatment has been found to be important. The more chronic and serious the state of the client, the more intensive the manner of the VAT conducted. In practice, the intensity of the VAT can vary from 2 sessions per day to 1 session per week. VAT is a process, which means that most usually there is a series of treatment sessions. Typically this means 10 to 15 sessions, but sometimes longer periods (up to tens of sessions) are needed or intensive interval periods of 2 to 4 times per year for maintaining the positive effects.

Documentation and Evaluation of the Treatment

If we want to create the effective treatment strategies and procedures, and if we are able to communicate with related professionals, then we must have tools for the documentation and evaluation of the treatment. The most typical tool for evaluation of the VAT is the VAS, which assists in the evaluation of a characteristic or attitude that is believed to range across a continuum of values and cannot be succinctly measured, bit can be implemented in a referential way. The VAS is a psychometric, 10-cm-long response scale, which can represent a variety of variable aspects related to critical aspects of a client's problems. For example, it could be related to the question, ''How severe is your pain?'' As the left end of the scale marks the situation when there is ''no pain,'' the right end of the scale marks the situation where it is the ''worst pain imaginable.'' The impact of the VAS assessment is of the highest value when evaluating change within the individual. It is applicable, easy, and relatively fast to use. The weakness of the VAS assessment is that it is highly subjective and not useful if there is a need for comparison across a group of individuals at 1 point in time. By using VAS or other measurement and evaluation tools, we are able to collect information about the effects of VAT. It is important to collect these data during the entire course of the treatment process, so that we are able to see the possible trends of changes in measured symptoms such as pain. If we only collect information before and after the treatment process, we are not able to see the full spectrum of the client's experience with all its nuances and fine details. When we have a good ongoing evaluation and documentation system, it is also easier to make recommendations for follow-up treatment. For example, we are able to gain insight on the duration of the positive effects of VAT for a client with fibromyalgia symptoms and make recommendations for the needed frequency of VAT interval periods.

Clinical Training for VAT

A formal and comprehensive training that addresses the theoretical issues and clinical applications of VAT has been available since the fall of 2005, when the first training course started in the Eino Roiha Institute in Jyväskylä, Finland. The training is the equivalent of 12 ECTS credits (European Credit Transfer and Accumulation System, a standard for comparing the study attainment and performance of students of higher education) and consists of 7 intensive study weekends over a 7-month period. The authors of this article are the developers and main trainers for the training program, and the other trainers are professionals who use VAT in their clinical practice with varying client populations (eg, within the assessment for rehabilitation and treatment, addiction problems, and psychiatry).

The training offers skills to students for systematic use of VAT, and this is inclusive of current practice and research about the possibilities of the method, which deepen theoretical knowledge on its use. Additionally trainees' direct their attention to the wholeness aspects of the treatment process including all of its elements (low-frequency sound vibration, music, interaction, space, treatment strategies, procedures, etc). Hands-on feedback in an experiential format within the role of client and therapist is a critical aspect of the training.

The content of the training is divided into 8 sections: (1) the basics of low-frequency sound therapy, (2) introduction to the methods and devices of low-frequency sound therapy, (3) elemental uses for VAT-treatment programs and the fundamental uses of VAT: strategies and procedures, (4) interaction and therapeutic relationship with a client, (5) body awareness as a tool for therapist and client, (6) the role of and possibilities for using music in VAT, (7) supervision and clinical practice, and (8) case studies. The case studies conducted thus far within the literature include topics such as VAT as a method for alleviating symptoms of fibromyalgia, effect of VAT on high muscle tone and spasticity, VAT in the treatment of insomnia, VAT as a method for alleviating menstrual pain.

Based on the collected feedback from students after completing 3 training courses and several shorter intensive follow-up courses, we have learned that the aims for training are attainable. Our current challenge lies in our desire to develop strategies that can support the network of trained clinicians and furthermore to assist in the utilization of their clinical experiences as a basis for the development of cumulative knowledge and a database. In the next few years, we will initiate training programs in other countries and organize follow-up courses with specific topics in VAT research and practice addressing issues related to treatment application and strategy in greater depth and detail.

Discussion

The VAT has been used as a part of music therapy, physiotherapy, and rehabilitation for almost 30 years. Recently it has also been adapted as a part of psychotherapy practice, for example, in drug rehabilitation.[35] We defined VAT as the use of low-frequency sound vibration combined with music listening and therapeutic interaction and reflection,

which make it a holistic form of therapy. The VAT enables a client to become naturally aware of body–mind connection and study the experiences at all levels (sensorimotor, emotional, and cognitive). Perhaps this is why VAT seems to be particularly beneficial for clients with psychosomatic symptoms.

Problems in the clinical practice of VAT have been related to the lack of knowledge and skill when implementing the treatment. This is the reason why comprehensive training is critical, particularly if we want to provide the most effective use of VAT and its additional value in the field of care and rehabilitation. The experience of hands-on application and supervision is imperative to the VAT training that is offered as a formal and comprehensive training for clinicians in the field of VAT. Based on this belief and experience, we have outlined an international training model, which consists of 3 levels. The first level is an introduction to VAT. The second level includes VAT-practitioner modules 1 to 3, and when completed, provides a certificate for the VAT-practitioner. The third level is advanced VAT-practitioner level, and a VAT-practitioner is eligible to apply for this level having completed level 2 and having obtained the required clinical practice and training experience. All 3 levels together amount to 20 ECTS. We have also outlined the specialized training that consists of 2 strands, depending on the advanced practitioner's orientation and qualifications: (1) psychotherapeutically oriented VAT and (2)trainer and supervisor in VAT.

Through training, clinicians would be able to use VAT in a more justifiable, professional and systematic manner. They can also start to implement the collection of case results from their daily clinical work. This would gradually lead to good quality case studies that would increase the data and knowledge base of VAT and help us to recognize the areas that should and could be investigated more, as clinical trials in larger scale studies.

In Finland, we have a long history and tradition in VAT. The training and clinical work is also well established, and connections to hospitals, multiprofessional teams, and medicine mean that potential clinical target groups can be easily reached. We are at the beginning of establishing a development and research center for VAT. The center will have an international advisory board that serves as a central point for networking VAT clinicians and researchers all over the world. Larger scale multicenter studies will strengthen applications for funding future projects. We must also learn from previous studies and improve study designs in order to conduct good quality studies using the best practices both in intervention and research. Looking to the future, we need more basic research on low-frequency sound as stimuli, as well as more applied research on the effects of the clinical use of VAT with specific target groups, defining those that seem to benefit most from this form of therapy.

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