

The Effects of Vibroacoustic Music on Symptom Reduction Inducing the Relaxation Response through Good Vibrations

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"Good, good, good, good vibrations" proclaimed the Beach Boys in both words and vibrant harmony. As with most of their music, the simple lyrics are outweighed by harmonic message. Still, their teenaged composer and lyricist, Brian Wilson, was inspired by why dogs barked at specific people and why certain girls emanated exciting vibrations ("excitations"). Music and vibration would appear to be far from the concerns of human adaptation, but surprise has always been a driver of scientific investigation.

The need for hospitalized patients to experience the relaxation response as an antidote to the stress of treatment and adjustment to the possibility of chronic or life-threatening conditions is clear. The systematic application of music to promote positive changes in behavior has been used successfully in a variety of hospital settings. The effectiveness of music interventions in stress management has been measured physiologically and behaviorally.

This present study extends previous research by describing the outcome of a recreation therapy program of Vibroacoustic music (VAM) offered to hospitalized patients. Results indicate over 50% reduction of pain and symptoms through the use of VAM. In order to provide patients with assistance in achieving the relaxation response, recreation therapists at a major federal research hospital created several relaxation opportunities for patients and family members. Included in these opportunities were classes in:

- Relaxation techniques (instruction in progressive relaxation, guided imagery, autogenic training, rhythmic breathing, light exercise and mindfulness meditation);
- Tai chi;
- Group meditation
- Other focus activities (i.e. exercise, arts, and crafts)

In addition, the recreation therapists created a relaxation room, equipped with four Somatrons, which is commercially available Vibroacoustic Music Recliner delivering ear-level stereo sound and tactile vibrations that allow the body to feel the music that is normally only heard. Patients can access an initial session in the relaxation room using anxiolytically designed (relaxing) music titled "Balance." Subsequent uses of the relaxation room have employed either "Balance" or music from "The Musical Body" (Therasound). In all cases, the relaxation room is a recreation therapist-guided session with a 10-minute introduction, 25 minutes of music/vibration, and about 10 minutes of debriefing (a total of 45 minutes per session).

The researcher and colleagues were surprised at patients reporting that they received unintended (and unadvertised) symptomatic relief as a result of VAM. These unsolicited

testimonials led the program evaluation to include a measure of patient symptoms in both pre and post VAM sessions.

Method (Sampling Procedure)

A program evaluation yielded data from the use of these VAM recliners with anxiolytic music gathered from 272 adult patients in a major research hospital. This was a convenience sample of those who came to the relaxation room. Patients were recruited by several methods; physician referral, patient response to recreation therapist recommendation, or patient response to information about the relaxation room (printed materials and word of mouth from other patients). These patients had varying diagnoses; cancer (97); heart, lung, and blood disorders (55); infectious disease (54); mood disorders (32); and miscellaneous conditions (34). Their ages ranged from 21 to 67, with an average age of 43.7 years. Females made up 53% of the sample. Again, this study reports a program evaluation. As such, no effort was made to develop a meaningful control group.

Measurements and Variables

Data were gathered from two patient self-report instruments, completed immediately before and after the VAM session. State of relaxation was measured by selecting one of seven statements from the "Self-Report Rating Scale for Tension and Relaxation" asking "Which of the following best describes the way you feel right now?"

1. Feeling more deeply and completely relaxed than I ever have.
2. Feeling completely relaxed throughout my entire body.
3. Feeling more relaxed than usual.
4. Feeling generally tense throughout my body.
5. Feeling relaxed as in my normal resting state.
6. Feeling extremely tense and upset throughout my body.
7. Feeling some tension in some parts of my body.

All 272 patients completed this Self-Report Rating Scale for Tension and Relaxation. It was used as a comparative value for the symptom intensity, visual analog scale.

Because this study attempted to track whatever symptoms patients were experiencing at the moment before the VAM session, the open-ended questions asked of them were: "What symptom(s) are you experiencing now?" and "At what level of intensity?". Up to three symptoms were requested from our patients, and they were asked to place a hash mark on a visual analog scale (VAS) to rate the intensity of each particular symptom. The line was anchored at its ends by the printed phases "not at all" and "very much." Some chose no symptoms.

The pre-post data set afforded a between-groups analysis among the dependent variables. To analyze the results, we employed a paired t-test to determine the probability of the changes in pre versus post differences.

Results (Descriptive Findings)

To measure the state of relaxation, the seven point Self-Report Rating Scale for Tension and Relaxation was used. With N=272, the pre rating was 5.12 (5 is "Feeling Some Tension in Some Parts of My Body") while the post rating was 2.77 (3 is "Feeling More Relaxed Than Usual"), a statistically significant difference. Although this scale is ordinal, anchored with descriptive language (categorically ordered), the Bartlett's test of fit allowed for an estimation of effective improvement of 33.4% in state of relaxation.

Aggregation of the symptom data showed an average participant pre (VAS) rating of 67.20 (of 100) and a post rating of 31.55, a 53% reduction in cumulated symptoms. Only the first (of up to three) symptoms was analyzed in this program evaluation to simplify the data displayed here. The most frequently identified symptoms were tension-anxiety, pain fatigue, nausea, headache, and depression, which comprised 92% of the symptoms mentioned. The post rating was done at the end of the VAM session in order to determine the perceived effect in order to determine the perceived effect of the session on the symptom and to reduce the influence of other variables. Each of these symptoms showed reduction in intensity based on pre-post mean scores. The intensity of symptoms was reduced from pre to post by the following percentages; nausea 61%; headache, 58%; tension-anxiety, 54%; pain, 53%; depressed mood, 49% and fatigue, 47%. A one-sample t-test (pre-post) was performed and all the results were statistically significant at $P < .0001$.

Discussion

Data were not analyzed by diagnostic group for purposes of this study. An inspection of the patient-reported symptoms showed that such symptoms frequently were not associated with the disease, only occasionally associated with the treatment (i.e. nausea from chemotherapy), and were clustered under what could be called psychosocial stress (a result of disease, hospitalization, and experimental treatment) secondary to primary diagnosis. Since both the room and program name were titled "relaxation," the author felt that changes in self-reported symptom intensity would be far from "leading" (not telling us what they thought we wanted to hear). Still, patients seemed to find a way to give us answers we wanted to receive. That kind of willingness, plus the nonrandom selection and lack of control group, should give rise to suspicion as to our results.

This program evaluation data yielded descriptive information showing symptom reduction over the period of a single 45-minute VAM session. Having conceived this program evaluation as an initial exploration, the researcher offered no initial hypotheses. The robustness of these salutary results, however, affords the opportunity to at least speculate on what might be going on during VAM.

The power of the relaxation response may yet to be fully documented. Hypnotic trance states have been used to help patients successfully through difficult medical procedures, such as surgery, with considerable less post-surgical complications and reduced recovery time. The whole area of mind-body medicine struggles with hypothesis development that

requires an expanded view of reciprocal causation in the sympathetic and parasympathetic systems.

Another speculation offered is the role of the placebo effect and positive expectations. Our focus on the relaxation response (name of the room, program name, and asking for relaxation ratings) was helpful in minimizing any expectation for symptom reduction. Still many patients are given to please their caretakers and we might well have measured a response bias. The placebo effect has been measured as strong as 30 - 60%. It is clearly a real effect and ought to be optimized rather than ruled out. Even double-blind, random selection studies are unable to factor out the placebo effect; therefore, we acknowledge and embrace this limitation.

The focus of this study touches on the role of music/vibration in human adaptation. In some way, music/vibration of certain frequencies, intensities, rhythms, etc., might be implicated in the body's regulatory mechanisms. In general, most hospitalized patients could benefit from some form of down-regulation of "sympathetic tone" (an interesting phrase in this discussion). The researcher entertains the notion that multiple mechanisms of the body may use music/vibration to regain a healthy homeostasis. Indeed, Chesky has suggested that pacinian corpuscles, excited by vibrations of certain frequencies, may mediate pain and other noxious stimuli.

Disease can be seen as the inability of the human organism to cope with or handle disturbances insulting to its homeostatic systems. The science of medicine is being reshaped by the role of molecular messengers that communicate to regulatory mechanisms in ways that are well beyond our understanding of the "hard-wired" nervous system. The blood-brain barrier has become about as relevant as the Berlin wall. If the super-high-frequency vibrations of light affect our mood states and biological time clocks, how far afield is it to suspect that music and vibration (at much lower frequencies) have effects on psycho-neurophysiology?

In the future, when this program evaluation develops into a more carefully conceived research study, with attention to patient selection and assignment, an attempt at a control condition, and a range of calibrated dosage levels, our research team will be in a better position to make stronger claims generalizability. Nonetheless, sufficient data were generated to indicate that many patients using VAM experienced a deep relaxation response and reduced their symptom burden. Clinical impressions by the group of five recreation therapists were commensurate with the statistical significance reported. Having some personal control of their symptom burden pleased most patients. This positive outcome was used to point out that patients could clearly benefit by regular practice of an effective relaxation technique. Patients were given additional training in the "Art of Relaxation; class, through individual instruction, or by readings.

Conclusions

The present results suggest the value of using VAM to induce the relaxation response in order to reduce the symptom burden of hospitalized patients. These findings point to an

avenue of future research using careful selection assignment, controls, variable dosage, and longer follow-up periods to test the durability of VAM interventions. Perhaps Brian Wilson was more right than he knew when he recommended that we would do well to "Keep good vibrations a happenin' to me."

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Symptom Change from a Single VAM Session						
Symptom (N)	Pre	SD	Post	SD	% Diff.	P
Tension (74)	67.85	19.90	31.18	19.88	54.00	<.0001
Fatigue (60)	72.16	17.48	37.98	22.61	47.36	<.0001
Pain (46)	64.96	20.32	30.33	18.05	63.33	<.0001
Headache(24)	60.46	20.77	25.67	19.90	57.64	<.0001
Depression(18)	71.00	19.77	35.89	19.25	49.45	<.0001
Nausea (16)	67.25	20.66	26.25	50.47	60.97	<.0001
Other (29)	61.97	19.44	27.10	22.49	56.27	<.0001
Combined(267)	67.19	19.67	31.54	20.70	53.04	<.0001

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