

Effect of Indian Devotional Music on Students and Performers Measured with Electron Photonic Imaging

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Abstract

The effect of music on the physiological and psychological well being is documented in the literature. The present study aims at finding the influence of Indian devotional music on the human energy measured with EPI (Electron Photonic Imaging) also known as (Gas Discharge Visualization (GDV) technique. The subjects were from Swami Vivekananda Yoga Anusandhana Samsthana, Bengaluru, the performers (singers and accompanists) of the music program and the audience. It was a 2.5 hrs program of Indian devotional music. The design was a pre-test and post-test one. After getting informed consent, sixteen students were taken randomly for the pre data. The pre data of three singers and three accompanists was also obtained. Four from the students and one from the singers dropped in the post data. SPSS version 19 was used for the analysis. GDV parameters- area and intensity - showed positive significant increase and the entropy was not significantly decreased in the students and though the change is not significant, the same trend is found in the singers and accompanists. The interviews of the audience were transcribed into different themes. On the whole, the parameters showed that Indian music entertained, relaxed and energized the listeners.

KEYWORDS: EPI, GDV, area, intensity, entropy, Indian devotional music.

Introduction

The influence of music is not unknown to the world. Music evokes strong emotion (Koelsch, 2010), changes mood (Schellenberg, 2013) and consoles the mind (Prajnanananda, p. 356). Singing and listening have different effects. Singing has positive influence on the health and well being of the singer. It arouses positive emotions and improves immune functions (Gunter, Stephan, Sonja, Volker, Dorothee, 2004). Fast tempo music piece provides higher arousal and mood change compared to slow tempo music (Schellenberg, 2013).

The effects of listening to music have also been investigated widely. Listening to relaxing music reduced subjective anxiety, systolic blood pressure and heart rate (Knight & Richard, 2001), pulse rate and respiratory rate (Siritunga, Wijewardena, Ekanayaka, Mudunkotuwa, 2013) in normal healthy men and women and state anxiety in the students after the exposure of a stressor (Labbe, Schmidt, Babin, Pharr, 2007). Cognition is benefitted by long term music listening (Schellenberg, 2013). Music distracts attention (Dibben and Williamson, 2007). This distraction is useful in pain relief (Mitchell, MacDonald, Knussen, Serpell, M. G., 2007).

Music is also used as a therapy because it reduces systolic blood pressure (Mandel, Davis and Secic,2013, Khoshkhou, 2010), stimulates the depressed (Ashida, 2000, Abhijeet et.al, 2009), pacifies agitated behavior (Lou, 2001) and reduces hyperglycemia (Khoshkhou, 2010, Cioca, 2012, Mandel, Davis and Secic,2013) and dementia (Sakamoto, Ando, & Tsutou, 2013).

Listening to a combination of Indian cine, classical, folk and instrumental music reduced stress during colonoscopy (Harikumar et al, 2004). Indian classical instrumental music throughout gastroscopy reduced systolic blood pressure, diastolic blood pressure, heart rate and respiratory rate (Kotwal, Rinchhen and Ringe, 1997). Raga Darbari Kanada for 22 minutes reduced systolic blood pressure, diastolic blood pressure, pulse rate and respiratory rate in asymptomatic individuals (Siritunga, Vijayendra, Eknayaka et al., 2013). The combination of Bageshri, Bhupaltodi, Ahir Bhairav, Kalyan and Chandrakans ragas for three months reduced the systolic and diastolic blood pressure, Fasting Blood Sugar, HbA1c, LDL and VLDL and increased HDL significantly, in metabolic syndrome patients (Sharma & Mathur, 2011). Instrumental music in Hindustani Todi raga reduced pain in children undergoing venepuncture (Balan, Bavdekar, Jadhav, 2009). But listening to Neelambari raga for one and half hours did not change the sleep pattern of the male healthy volunteers (Gitanjali, 1997).

India is a land of spirituality. In ancient India music was taken as sacred and religious and it was associated with rituals and temple worship (Bhagyalekshmy, p. 2). Different parts of India have similar cultures though different languages. The devotional singing in different parts of India are in different languages. The Kirtans (devotional songs) of the famous saint poets like Tyagaraja, Syama Sastry, Muttuswami Dikshitar, Bhadrachala Ramadas and the abhangas of Tukaram, Jnanadev, Meerabai, Sikh Bhajans and many more compositions of renowned saint poets are sung in programs.

One such program of devotional music was organized by SVYASA in Bangalore. The effect of the music was measured with EPI (Electron Photonic Imaging) also known as GDV (Gas discharge visualization) technique.

EPI is a new tool which works on the principle of Kirlian photography. It images the photonic light produced by ionization of gas molecules around the object through a sliding discharge due to the emission of excited electrons avalanches caused by a pulse with high voltage and high frequency (Korotkov, 2004). Figure 1 shows a schematic of the system. A finger of the subject is placed on a specially constructed glass plate. A brief high voltage, high frequency current is impressed on the finger through a metal filter at the underside of the glass plate. Electrons pulled out of the finger in this manner collide with air molecules in the atmosphere surrounding the finger and creates a discharge pattern. Thousands of experiments conducted in Russia have shown a correlation between organ function and discharge pattern. This tool is also very sensitive to capture the influence of thoughts, emotions and mental exercises on the human energy (Khannanov, 2009). A filter (special plastic membrane) may also be interspaced between the finger and the glass plate. The images that are taken without filter reflect the person's

current psychological and physiological condition and with filter the somatic level of energy.

Aim

To find out the effect of Indian devotional music on the students, singers and accompanists and the audience.

Objectives

- To find out the effect of listening to devotional music on the area, intensity and entropy in the EPI patterns of students.
- To determine the effect of listening to music on the emotion of the audience.
- To find the effect of singing on the area, intensity and entropy in the EPI patterns of the singers.
- To determine the effect of playing the instruments on the area, intensity and entropy in the EPI patterns of the accompanists also.
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Null hypotheses

- There will be no change in the area, intensity and entropy in the EPI parameters of the students before and after listening to devotional music.
- There will be no difference in the emotions of the audience before and after listening to the devotional music.
- There will be no change in the area, intensity and entropy in EPI patterns of the singers before and after singing the devotional music.
- There will be no change in the area, intensity and entropy in EPI patterns of the accompanists before and after playing the instruments.

Materials and methods

This is a mixed method design. The response of the students, singers and accompanists was measured using EPI and the audience with short interviews. The source of the students was Swami Vivekananda Yoga Anusandhana Samsthana, the singers and accompanists who participated in the program and the audience from different parts of the city.

Inclusion criteria

The students were sampled randomly. All the musicians and accompanists were included in the study. Fifty five people from the audience were randomly interviewed.

Exclusion criteria

Participants with fingers having obvious visible lesions such as cuts or cracks, moles or tattoos, less or more number of fingers than the normal and hearing impaired were excluded. People from the audience who were not willing to be interviewed were also excluded.

Tool of measurement

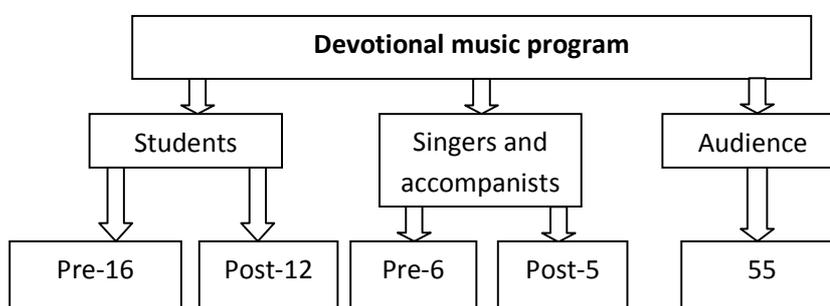
GDV Pro instrument was used to capture the data.

Intervention

An Indian devotional music program of 2.5 hours.

A flow chart (Figure 1) is given to show the details of the subjects.

Figure 1: Flow chart of data collected



Data extraction

After taking informed consent of the students, singers and accompanists, the pre and post data were extracted with EPI. People from the audience who were willing to participate were interviewed for eliciting general comments regarding their experience after the program.

Data analysis

Data analysis was done with SPSS 19 version and Excel. Shapiro Wilk's normality test was done for the EPI parameters of the students and singers and accompanists. Students' entropy was not normally distributed. Hence, Wilcoxon non-parametric test was carried out. Paired sample t test was done for the difference between pre and post results both for the students and the performers.

Audience response was measured using interview and later themes were gathered by the transcribed interviews.

Results

The present data supports the hypotheses that listening to music brings a significant change in the area (9006.75 ± 1966.71 to 10295.70 ± 1600.48 , $p=0.003$) and intensity (73.37 ± 6.78 to 84.11 ± 6.59 , $p=0.002$) of the students (Table1). The area (from 12678.86 ± 1730.771 to 13289.34 ± 1508.254 , $p = 0.20$) and intensity (from 84.44 ± 7.83 to 86.28 ± 1.61 , $p=0.61$) of the singers and accompanists also increased

showing the same trend but the increase is not significant (Table 2). In case of entropy the results fail to reject the null hypothesis. The interviews supported the positive change in the audience (Table 3).

Table 1

Pre – post values of area, intensity and entropy of the students

Variable	Pre	post	t value	p value	Effect size
Area	9006.75±1966.71	10295.70±1600.48	-3.702	0.003**	0.71
Intensity	73.37±6.78	84.11±6.59	-4.179	0.002**	1.60
Entropy	3.08±0.30	3.07±0.11	-0.863	0.388	0.07

** p<0.01

Table 2

Pre – post values of area, intensity and entropy of singers and accompanists

Variable	Pre	Post	t value	p value	Effect size
Area	12678.86±1730.771	13289.34±1508.254	-1.53	0.20	0.37
Intensity	84.44±7.83	86.28±1.61	-0.56	0.61	0.25
Entropy	3.01±0.15	3.00±0.09	0.40	0.71	0.07

Themes were derived from the transcribed interviews of the audience. A sample of the transcribed version is given as follows: 1. It was terrific. I just loved it. 2. Amazing. 3. Really outstanding. 4. It was wonderful. It puts you to another mood altogether, happy, light hearted and free. 5. It is divine. It is beautiful.

A total of 55 responses were divided into different themes as shown in Table 3.

Table 3

Thematic representation of the response of the audience

Theme	No. of people
Enjoyment	11
Expansion	2
Exaltation	2
Freshness	1
Memorable	3
Loved	33
Divinity	3
Soothing	1

Discussion

In the present study, listening to a 2.5 hrs program of Indian devotional music increased the EPI parameters as follows: area (from 9006.75 ± 1966.71 to 10295.70 ± 1600.48 , $p=0.03$) and intensity (from 73.37 ± 6.78 to 84.11 ± 6.59 , $p=0.02$) of the students increased significantly. Singing and playing the instruments did not show significant increase in the area (from 12678.86 ± 1730.771 to 13289.34 ± 1508.254 , $p=0.20$) and intensity (from 84.44 ± 7.83 to 86.28 ± 1.61 , $p=0.61$); however, the increase is considerable. It may be because that the professionally settled musicians have a relaxed approach towards the performance (Robert, Terry, David et al, 2006). This increase in area and intensity could indicate increased physiological protection mechanism of the body from the influence of the toxins (Gibson, 2004). Negligible change in entropy in both students and performers shows that the organism uses internal energy economically (Korotkov, 2002).

The themes derived from the interview of the audience support the results of EPI that listening to devotional music enhances the energy and feelings of expansion. The music took to the otherworld suggests the elevation of spirituality. The themes have also shown that the devotional music is loved not only by the elderly but also the people of different ages.

Conclusion

Listening to devotional music entertains, expands and energizes.

It may be used as a therapy to strengthen the human energy field.

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References

- Deshmukh, Abhijeet, D., Sarvaiya, Avani, A., Seethalakshmi, R., Nayak, & Ajita, S. (2009). Effect of Indian classical music on quality of sleep in depressed patients: a randomized controlled trial. *Nordic Journal of Music Therapy*, 18(1), 70-78.
- Ashida, S. (2000). The effect of reminiscence music therapy sessions on changes in depressive symptoms in elderly persons with dementia. *Journal of Music Therapy*. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/10990595>.
- Balan, R., Bavdekar, S. B., & Jadhav, S. (2009). Can Indian Classical Instrumental Music Reduce Pain Felt During Venepuncture? *Indian Journal of Pediatrics*. 76, 469–473.
- Bhagyalekshmy, S. (2011). *Lakshnagranthas in music (3rd edn.)*. South India: CBH Publications.
- Cioca, I. E., House, (2013). Type 2 diabetes–psychosomatic disease approachable through music therapy, *Proceedings of the Romanian Academy - Series B*, 15(1), 38-46.

- Gibson, S. S. (2004). Effect of listening to music and focused meditation on the human energy field as measured by the GDV and the profile of mood states (poms).In: Konstantin.
- Gitanjali, (1998). Effect of the Karnatic on sleep architecture music ragas “Neelambari”. *Indian Journal Physiology* 42(1), 119–122.
- Harikumar, R., Raj, M., Paul, A., Harish, K., Sunil Kumar, K., Sandesh, K., & Thomas, V. (2006). Listening to music decreases need for sedative medication during colonoscopy: a randomized, controlled trail. *Indian Journal of Gastroenterology*, 25(1), 3.
- Khannanov, I., Korotkov, K., & Orlov, D., (2009). Essay in Bioelectrography of Musical Effects Environment Proceedings of XIV International Scientific Congress on Bioelectrography “Science. Information, Spirit”, Saint-Petersburg.
- Khoshkhou, F., Bakhshipoor, A. R., Dashipour, A., & Keramati, M. R. (2010). Comparison of the effect of combined relaxation and music therapy on blood biochemical characters and blood pressure on type 2 diabetic patients. *Zahedan Journal of Research in Medical Sciences*, 12(3), 24-28.
- Koelsch, S. (2010). Towards a neural basis of music-evoked emotions. *Trends in Cognitive Sciences*, 14(3), 131–7. doi:10.1016/j.tics.2010.01.002.
- Korotkov, K.G., (2002). Human Energy Field: Study with GDV Bioelectrography Current Research. 1st ed. Fair Lawn, USA: Backbone Publishing Co.
- Korotkov, K. G., (2004). Measuring Energy Fields: Current Research. 1st ed. Fair Lawn, USA: Backbone Publishing Co.
- Korotkov, K.G., (Ed.). Measuring Energy Fields: Current Research–Backbone Publishing Co. Fair Lawn, USA, 2004. pp. 209-222.
- Kotwal, M. R., Rinchhen, C. Z., & Ringe, V. V. (1998). Stress reduction through listening to Indian classical music during gastroscopy. *Diagnostic and therapeutic endoscopy*, 4(4), 191–7. doi:10.1155/DTE.4.191.
- Kreutz, G., Bongard, S., Rohrman, S., Hodapp, V., & Grebe, D. (2004). Effects of choir singing or listening on secretory immunoglobulin A, cortisol, and emotional state. *Journal of Behavioral Medicine*, 27(6), 623–35. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/15669447>.
- Labbé, E., Schmidt, N., Babin, J., & Pharr, M. (2007). Coping with stress: the effectiveness of different types of music. *Applied Psychophysiology and Biofeedback*, 32(3-4), 163–8. doi:10.1007/s10484-007-9043-9.

- Lou, M. F. (2001). The use of music to decrease agitated behaviour of the demented elderly: the state of the science. *Scandinavian Journal of Caring Sciences*, 15(2), 165–73. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/12078630>.
- Mandel, S. E., Davis, B. a, & Secic, M. (2013). Effects of music therapy and music-assisted relaxation and imagery on health-related outcomes in diabetes education: a feasibility study. *The Diabetes Educator*, 39(4), 568–81. doi:10.1177/0145721713492216.
- Mitchell, L. a., MacDonald, R. a. R., Knussen, C., & Serpell, M. G. (2007). A survey investigation of the effects of music listening on chronic pain. *Psychology of Music*, 35(1), 37–57. doi:10.1177/0305735607068887.
- Prajnananda, S.(1981). *A historical study of Indian music* (2nd edn.). New Delhi: Munshiram Manoharlal Publishers Private Ltd.
- Robert, J., Terry, L., David, J., Caitlin, A., & Kenneth, W. (2006). Supporting the Health of College Solo Singers: The Relationship of Positive Emotions and Stress to Changes in Salivary IgA and Cortisol during Singing. *Journal for Learning through Arts*, 2(1). Retrieved from <http://escholarship.org/uc/item/003791w4>.
- Sakamoto, M., Ando, H., & Tsutou, A. (2013). Comparing the effects of different individualized music interventions for elderly individuals with severe dementia. *International psychogeriatrics / IPA*, 25(5), 775–84. doi:10.1017/S1041610212002256.
- Schellenberg, E. G., & Glenn, E. (2013). Music and Cognitive Abilities. *Current Directions in Psychological Science*, 14(6), 317–320.
- Sharma, M., & Mathur, K. C. (2011). Effects Of Music Therapy On Clinical And Biochemical Parameters Of Metabolic Syndrome. *Journal of Bangladesh Society of Physiologist*, 6(2), 108-115.
- Siritunga, S., Wijewardena, K., Ekanayaka, R., & Mudunkotuwa, P. (2013). Effect of music on blood pressure, pulse rate and respiratory rate of asymptomatic individuals: A randomized controlled trial. *Health*, 05(04), 59–64. doi:10.4236/health.2013.54A008.