



## BENEFICIAL EFFECTS OF SINGING ON DIFFERENT SYSTEMS AND WELL-BEING OF MAN IN DIFFERENT TRIALS

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<https://doi.org/10.59436/jsiane.355.2583-2093>

### Abstract

Present review article explores new doors to open for the different health benefits of singing on singers. This review article is based on works and trials done on different groups of singers and non singers in different environment around the global arena of research by a wide s range of scientists. Past works over fifty years have included in such article. Lot of researchers conducted their researches and trials on human and through many experiments. They enumerated the effects of singing on the different biological systems like cardiovascular system, respiratory system and nervous and psycho-somatic systems. The latter further divided into stress, mood, stuttering, Parkinson's disease. All the above mentioned systems got improved in their efficacies and reduction in the nervous disorders by virtue of singing on singers through various short & long term exercises done by different scientists. Author wants via such article to let the new researchers know about innovative works on singing and its health benefits in direction of naturopathy.

**Keywords :** secretory immunoglobulin A (S-IgA), chronic obstructive pulmonary disease, stutter, dysfluency, Parkinson's disease

Received 11.12.2022

Revised 19.02.2023

Accepted 26.03.2023

### Introduction

Research indicates that vocalizing has multiple advantages for men's health, including reducing speech dysfunction, enhancing cardiorespiratory function, lessening stress, improving mood, promoting hormonal balance, and potentially benefiting cognitive function. Though not exclusively targeted towards men, these benefits are broadly applicable, and some studies suggest that men may be especially prone to certain health issues that singing can assist with. This current review paper is based on previous research on singing and its therapeutic impact on human health, particularly on cognitive capabilities. Because it engages the muscles responsible for breathing, phonation, articulation, and resonance, vocalizing—the production of musical sounds with the voice—may help with speech abnormalities. Powerful, quick inspirations and long, controlled expirations are the building blocks of singing. Tonkinson (1994) found that controlled breathing helped in note-sustaining, while Wiens, Reimer, and Guyn (1999) found that it strengthened respiratory muscles, and Natke, Donath, and Kalveram (2003) found that it improved voice command. Various researchers have tackled the topic of the effect of singing on the cardiovascular system, resulting in the creation of this informative review article:

**Effect on cardiovascular system:**—The cardiovascular system can undergo physiological changes in response to music and singing, according to one important result (Chan, 2007; Mok and Wong, 2003). These changes include a

*J. Sci. Innov. Nat. Earth*

decrease in blood pressure and pulse rates and an increase in oxygen saturation levels. And research by Beck, Gottfried *et al.* (2006), Kreutz *et al.* (2004), and others has demonstrated that it boosts immune system activation. The consequences of strenuous vocal training on the heart and lungs have been the subject of additional investigation. In a study that pitted professional singers against non-professionals, Grape, Sandgren, Hansson, Ericson, and Theorell (2003) discovered that the former group's heart rate variability (HRV), a measure of cardiovascular training, rose considerably following vocal lessons. This provides more proof that singing may have positive effects on health in the long run, since professional singers appear to be in better cardiovascular shape than amateurs. Bradt *et al.* (2013) conducted research on the efficacy of music therapy in alleviating stress in individuals with coronary artery disease.

In a clinical research that was carried out in 2004, Gunter Kreutz and colleagues investigated the effects of choral music on emotional states, secretory immunoglobulin A (S-IgA), and cortisol. Several significant results emerged from the investigation. In instance, singing reduced negative affect while increasing positive affect and S-IgA. Choral music, on the other hand, reduced cortisol levels while raising negative affect in listeners. These results suggest that participation in a choir can have a positive influence on both emotional well-being and immune system function.

**Effect on respiratory system:**—Singing may improve breathing patterns, alleviate respiratory symptoms, and promote the desire to engage in physical exercise, according

to certain studies (Clift, 2010; Stacy *et al.*, 2002). Singing "very slowly" or "silently" enhanced the level of SpO<sub>2</sub> in simulated high altitude at least 3000 m, according to research by Idrose A.M. *et al.* (2022). Based on their findings, singing could be an intervention to increase oxygen saturation at greater altitudes.

Research on vocalization's therapeutic effects on respiratory capacity in patients with chronic diseases has recently been conducted. In their 2009 study, Bonilha *et al.* aimed to find out whether singing may improve pulmonary function metrics in COPD patients. One group of patients participated in weekly singing lessons, while the other group participated in craft activities (serving as a control). The patients were randomly assigned to either group. There was an increase in dyspnoea in the singing group after just two minutes of vocal workouts. Furthermore, a higher arterial oxygen saturation level was noted when singing. The inspiratory capacity of the singing group improved compared to the control group, which shown a decline in this parameter. Expiratory reserve volumes were found to be lower in the singing group compared to the control group, which showed an increase. A noteworthy difference between the singing and control groups was an increase in maximal expiratory pressure in the former. This finding is most likely explained by the fact that singing demands the continuous and extended use of respiratory muscles, which may aid those with COPD in maintaining expiratory pressure.

**Effect on nervous and psychosomatic system :-** The amalgamation of language, music, and instinctive human behavior in singing heightens neurological stimulation, making it a crucial aspect of music (Jeffries, Fritz, & Braun, 2003). Choral singing interventions in a group setting have shown potential in enhancing social interaction among individuals with dementia, leading to relaxation and a decrease in agitation levels (Lin *et al.*, 2011).

**Relief from stress:** Engaging in singing triggers the release of endorphins, which help to alleviate anxiety and stress. If you've ever participated in karaoke with friends, you'll understand it's about much more than just a casual evening—it's a joyful blend of laughter, friendship, and lasting memories. Scientific evidence shows that singing can decrease cortisol, the hormone linked to stress. This enjoyable practice acts as a therapeutic activity that is both cost-free and accessible to anyone. As a natural way to manage stress, singing promotes mental health by encouraging mindfulness and enabling you to focus on the present, freeing your mind from worries.

Just like any other form of aerobic exercise, singing has the ability to unleash a surge of endorphins, also known as "feel good" hormones or peptides, from the pituitary gland in our brain. While we may not typically view singing as a strenuous form of exercise, the deep breaths that fill our lungs, the precise control of our vocal cords, and the physical movements involved all require exertion - making it a valid form of aerobic activity. These endorphins have a direct impact on reducing stress by enhancing our mood, while also indirectly strengthening our immunity with a more positive outlook, enabling us to better handle stress. Chanda and Levitin (2013), Heiderscheit, Chlan, and Donley (2011), Koelsch (2015), and Uhlig *et al.* (2013) all note an uptick in the use of musical treatments, and singing in particular, to reduce stress in a variety of settings throughout the last decade. According to Bradt & Dileo (2014), Kamioka *et al.*

(2014), Koelsch & Stegemann (2012), and Nilsson (2008), these therapies also seek to improve physical and mental health by establishing a calming atmosphere that promotes relaxation and decreases stress. After singing, cortisol levels drop dramatically, according to research done in 2015 by Daisy *et al.* Researchers measured cortisol and cortisone levels in 15 vocalists before and after they sang in two different environments: a low-stress performance setting and a high-stress live event. A stress hormone secreted by the adrenal glands, cortisol controls emotions like joy, dread, and drive. It helps regulate the body's utilisation of protein, fat, and carbs as well. After singing in the low-stress performance setting, the researchers discovered that levels of cortisol and cortisone dropped significantly. Although singing may cause stress in and of itself, the research suggests that it has positive effects on health and reduces stress levels, especially in high-stress situations.

**Mood stability :-** The act of singing has proven to have profound effects on one's psychological state, surpassing mere auditory stimulation. In fact, a thorough analysis conducted by Clark and Harding (2010) delved into the impact of singing interventions on participants in therapeutic programs, revealing that actively singing as a group, rather than passively listening to music, boasts even greater benefits for mood and well-being.

**Reduction in Stuttering:** Singing has long been acknowledged as a powerful therapeutic therapy, and studies have shown that it can help stutterers become more fluent. As an example, a study was carried out by Healey, Mallard, and Adams (1976) to determine if singing might alleviate stuttering and, if so, what influence familiarity of the lyrics had in this effect. The participants were given popular songs with recognisable or altered lyrics and were asked to read or sing them. In the singing condition, participants' stuttering decreased more noticeably, and this effect was strongest when participants sang songs with lyrics they were already familiar with. It appears that singing can improve fluency to some extent due to familiarity, intonation, and longer durations of phonation. Andrews, Howier, Dozsa, and Guitar (1982) conducted their own research on the efficacy of different approaches to enhancing fluency (including singing) using many metrics. The singing condition asked participants to sing for 10 minutes to music of their choosing. Because phonation lasts longer when singing, the results showed a 90% reduction in stuttering frequency. Both Davidow, Bothe, Andreatta, and Ye (2009) and Colcord and Adams (1979) provided further evidence that singing may help with fluency. In a neuroimaging study that compared controls and stutterers, the phenomena of singing-induced fluency increase was also examined. By utilising positron emission tomography, Stager, Jeffries, and Braun (2003) examined brain activity during tasks that normally induce disfluent speech, such as sentence formation and unpaced event narration, as opposed to tasks that elicit fluency, such as singing and metronome-paced speaking. The baseline was established during a rest interval. There was a considerable increase in activity during activities that generated fluency compared to tasks that induced dysfluency in the auditory regions, which are responsible for processing speech and receiving sensory input. Additionally, there was an increase in activity in the motor and premotor regions, which are involved in articulatory motor motions. This provides more evidence that stutterers share an auditory-motor process that

enables them to self-monitor their speech and, in the end, improve control of their oral articulators.

#### Decrease in Parkinson's disease patients:

Voice and speech abnormalities (beyond those linked with ageing) are common in people with Parkinson's disease. According to research conducted by Rami, Fox, and Sapir (2008), over 80% of individuals diagnosed with Parkinson's disease may have issues related to their voice and speech at some point. According to Streifler and Hofman (1984), some of these problems might be so bad that they impair communication and general well-being. Weiner and Singer (1989) noted that conventional speech therapy techniques and current pharmaceutical therapies have not reliably alleviated these issues. This has led to persistent difficulties with verbal expression and comprehension for people living with Parkinson's disease.

In addition to the normal ageing process, a significant number of people with Parkinson's disease also experience difficulties with their voice and speaking. According to studies, over 80% of people with Parkinson's disease will face challenges with their voice and speaking as the disease progresses (Ramig, Fox, & Sapir, 2008). These challenges can be severe enough to hinder effective communication and diminish life quality (Streifler & Hofman, 1984). Despite the use of medication and conventional speech therapy methods, consistent improvement in these speech abnormalities has not been achieved (Weiner & Singer, 1989). Consequently, patients with Parkinson's often continue to struggle with speech clarity and oral communication. Certain techniques in voice therapy have incorporated singing as a method of intervention, with preliminary findings showing promise. In 2001, Haneishi performed research using a music-based voice protocol that included singing exercises and vocal warm-ups that emphasised breathing and phonation. Patients with Parkinson's disease showed considerable improvements in voice energy and speech intelligibility after 12–14 sessions. In 2008, Di Benedetto *et al.* performed an additional investigation that employed group choral singing as an intervention. This method included using chants accompanied by a piano to increase auditory rhythmic stimulation. Prosody, breathing, and laryngeal exercises were all a part of this program. Vowel phonation and reading were both improved in Parkinson's disease patients after 13 singing sessions. Although the studies were small and did not include control groups, the results nonetheless show that singing may help with Parkinson's disease speech problems. The effectiveness of these therapies should be evaluated in future studies using randomised controlled trials, and the effects of different doses should be investigated.

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