

RESEARCH ARTICLE

Effect of special breathing techniques on quality of life in elderly individuals

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ABSTRACT

Background: Growing age invites many health problems among elderly individuals which, in turn, affect their physical and mental health, leading to reduced social and environmental participation. This study aims to assess the effectiveness of special breathing technique Three-step Rhythmic Breathing (3SRB) on health-related quality of life (HRQoL) among elderly individuals. **Aims and Objectives:** The present study aimed to find the effect of special breathing techniques on quality of life in elderly individuals. **Materials and Methods:** Sixty-six elderly individuals (age group of 60–80 years) from old-age homes/senior citizen forum of Anand district were recruited by quasi-random sampling into two groups: 36 in Group A (physical exercise program) and 30 in Group B (3SRB with physical exercise program); based on inclusion and exclusion criteria after explaining the study purpose and obtaining the written informed consent. All elderly individuals were assessed for HRQoL (World Health Organization-BREF) before and after 8 weeks of intervention. **Results:** Frequency distribution was used to describe the data. The comparison within and between the groups for HRQoL was calculated using paired and unpaired *t*-test, respectively ($P < 0.05$). The results demonstrate significant improvement in all four domains of HRQoL in both groups after 8 weeks of training. However, the individuals trained for 3SRB along with physical exercise program had more improvement in HRQoL, especially with regard to physical health, psychological, and environmental domains. **Conclusion:** 3SRB along with physical exercises promotes better HRQoL among elderly individuals compared to physical exercises alone.


KEY WORDS: Aged; Health; Quality of Life; Exercise; Elderly

INTRODUCTION

Aging is defined in terms of chronological age with a cutoff age of 60 or 65 years. As per the United Nation report, the share of population in India over the age of 60 is projected to increase from 8% in 2015 to 19% in 2050 and by the end

of the century; the elderly will constitute nearly 34% of the total population in the country. Undoubtedly, the relatively young India today will turn into a rapidly aging society in the coming decades.^[1] Population aging is an inevitable and irreversible demographic reality that is associated with continuous decline in physical, functional mental, and social functioning of the elderly and it welcomes continuous improvements in health and medical care.

The prevalence of chronic conditions and the frequency increases in older ages. Close to 80% of adults aged 50 years or older have at least one chronic condition and the high prevalence of these chronic conditions at older ages

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significantly affects their functional abilities (e.g., diminished physical capacity, slowing cognition, decreased working memory, and difficulty with hearing and vision).^[2]

Although health in many developed countries has been used as a measure of morbidity and mortality, the World Health Organization (WHO) has defined it as a multidimensional construct that includes physical, mental, and social domains.^[3,4]

Quality of life (QOL) is a broad multidimensional model that by and large includes subjective assessment of both positive and negative domains of life. The notion of health-related QOL (HRQoL) was evolved during the 1980s to cover all the possible aspects of QOL being it physical or mental which can affect the health of an individual. HRQoL is considered to be an individual's insight into his/her physical and mental health, and its correlate over a period of time which includes their health risks, functional status, social support, and socioeconomic status of an individual.^[3]

Considering HRQoL as an outcome measure can help to identify and determine the burden of chronic diseases and their consequences in individual's life and help to monitor the progress related to health objectives. HRQoL questions assess the impact of health on QOL and it has become an important component of public health scrutiny. Self-assessed QOL is considered to be more reliable predictor of mortality and morbidity than many objective measures of health.^[3,4]

Various intervention programs exist, namely, tai chi training, strength and flexibility program, range of motion, balance, transfer, and mobility training in literature for the improvement of physical functions in elderly individuals. Effectiveness of tai chi has been studied among elderly individuals which significantly improved their ability to stand up from a chair and reduced systolic blood pressure, resting heart rate, and fear of fall.^[5] Strength and flexibility program has been found to have more beneficial impact on the timed up and go test, physical performance test, Mini-Mental Status Examination, and the Berg balance scale among elderly individuals.^[5,6]

The concept of health and, therefore, health-care intervention is undergoing constant metamorphosis; importance of positive health in physical, emotional, psychological, environmental, and spiritual domains is increasingly being recognized, while most of the modern physiotherapeutic interventions focus on physical well-being and its effect on QOL, the ancient Indian system of Patanjali yoga and its various derivatives focus on multiple dimensions of health.

Ancient wisdom recognized the link between good health and breathing. There are various asanas in yoga that aids in correct breathing. There are also a number of breathing exercises like pranayama; however, these can be practiced for a short span

of time and cannot help us to establish a correct pattern of breathing for all times. Here, we can turn our attention to Sage Patanjali's teachings, which stress the importance of three-step rhythmic breathing (3SRB), a breathing pattern that helps us "breathe in rhythm with nature." It has been claimed to have beneficial effect on overall well-being; however, there are no well-designed scientific stands.

The purpose of this study is compared the effects of standard supervised exercise program and special breathing techniques (3SRB pranayama) on physical performance and QOL in elderly individuals.

Objectives

The objective of this study was to study the effect of special breathing techniques on QOL in elderly individuals.

MATERIALS AND METHODS

Sixty-six elderly individuals (age group of 60–80 years) from old-age homes/senior citizen forum of Anand district were included in the study after explaining the study purpose and obtaining the written informed consent.

Study Design

This was a comparative study.

Sampling Method

This was a quasi-random sampling method.

Study Settings

This study setting was old-age homes/senior citizen forum of Anand district.

Inclusion Criteria

Elderly individuals, both males and females within the age group of 60–80 years, were included in the study.

Exclusion Criteria

Elderly individuals with any musculoskeletal or neurological problems affecting the functions of limbs, history of any cardiovascular or respiratory illness, namely, ischemic heart disease, congestive heart failure, and unstable cardiorespiratory vitals, and acute medical conditions such as tachycardia, tachypnea, uncontrolled hypertension, postural hypotension, arrhythmia, and chronic obstructive pulmonary disease; individuals with chronic liver or renal disease and altered psychological alertness affecting their ability to adhere to the treatment protocols were excluded from the study.

Methodology of Study

The research project was conducted after getting clearance from the human research ethics committee of the institution. Sixty-six elderly individuals fulfilling the inclusion and exclusion criteria were recruited by quasi-random sampling into two groups: Group A received physical exercise program and Group B followed 3SRB technique along with physical exercise program for 8 weeks. Individual in both groups was assessed for HRQoL before and after the intervention program. The HRQoL was measured by the WHO QOL-BREF questionnaire,^[7] which includes 26 items measuring the major four domains, i.e. physical health, psychological, social relationships, and environmental responsible for the overall QOL of an individual.

3SRB Technique

3SRB technique is an ancient technique which was derived from the Yoga Sutra of Sage Patanjali. It consists of six simple breathing exercises set to a particular rhythm and takes merely 9 min to perform. 3SRB is not a breathing exercise or an aid to correct breathing but is simply the natural way of breathing one that we were born with. A mindful and purposeful practice of this technique guides the individual to this rhythmic way of breathing.

The three steps of this 3SRB technique include the technique, volume, and rhythm of breathing:^[8]

- Technique – While breathing, both the chest and abdomen rise and fall simultaneously.
- Volume – While breathing in, it is very important to note that the breath flows freely and fully from neck to navel. It means that the middle and lower abdomen should be filled to normal capacity. The volume of breath intake during 3SRB should be the same as that of normal breathing.
- Rhythm – To set the accurate rhythm of breathing, inhalation should take 3 s and exhalation 2 s, so one complete breath takes 5 s or six pulse beats. The correct rhythm is to count 1-2-3 while inhalation and 5-6 while exhalation, 4 being silent. To master this technique, one must deliberately work to complete 12 cycles of breathing in a minute.

3SRB increases the awareness, stamina, and concentration levels and gradually reduced imaginary pressures such as competition, fear of failure, and worries about the future. It also reduces exhaustion, irritability, aggression, excitability, and depression.

Elderly individuals in Group B were taught the technique of 3SRB by a trained physiotherapist and were advised to continue the same daily for 8 weeks.

Physical Exercise Program

Physical exercise program for individuals in both Groups A and B included various activities related to flexibility,

strength, endurance, balance, aerobic performance, body awareness, and rhythm. One session in a week was guided by a trained physiotherapist. After the individual is fully acquainted with the program, he/she was asked to do the exercises by himself/herself daily.

The supervision and guidance by a physiotherapist were continued throughout the study period once in a week for a total of 8 weeks.

RESULTS

All the 66 elderly individuals completed the 8 weeks of intervention in both groups. The HRQoL was measured before and after the intervention in both groups. Descriptive statistics, namely, frequency (%), mean, and standard deviation were calculated. Intra- and inter-group difference in HRQoL was calculated to find the effectiveness of two treatment approaches in elderly individuals. Table 1 demonstrates the demographic details of the study participants in both groups.

The HRQoL was categorized into six components including question 1 (Q1), question 2 (Q2), physical health domain (Domain 1), psychological domain (Domain 2), social relationship domain (Domain 3), and environmental domain (Domain 4).

Statistically and clinically significant improvement was observed only in Domain 1 for the group underwent supervised exercise program [Table 2], whereas participants in group demonstrated significant improvement in all domains of QOL after 8 weeks of intervention except Domain 3 [Table 3]. When compared for the improvement [Table 4] between two groups, participants in Group B (3SRB technique + Physical exercise program) showed more improvement in HRQoL, especially for the physical health, psychological, and environmental domains compared to Group A who was delivered only physical exercise program ($P < 0.05$).

DISCUSSION

The present study showed the positive impact of the special technique of breathing in elderly individual in terms of every aspect of the health that included psychological, physical, social, as well as on spiritual also.

Table 1: Demographic details

Group	Numbers	Gender	Mean	Standard deviation
A (Physical exercise program)	36	Male–14 Female–22	65.53	4.178
B (3SRB technique+Physical exercise program)	30	Male–14 Female–16	66.97	4.951

Table 2: Paired sample *t*-test for Group A (n=36)

Domain	Pre-test HRQoL Mean±SD	Post-test HRQoL Mean±SD	Significance
Question 1	4.08±0.604	4.11±0.785	0.845
Question 2	3.83±0.845	3.94±0.955	0.487
Domain 1–Physical health	24.14±3.826	26.08±3.931	0.000*
Domain 2–Psychological	21.97±2.720	21.83±2.813	0.629
Domain 3–Social relationship	12.19±3.031	12.14±2.748	0.815
Domain 4–Environmental	33.31±4.167	33.56±3.745	0.263

P*<0.05. SD: Standard deviationTable 3: Paired sample *t*-test for Group B (n=30)**

Domain	Pre-test HRQoL Mean±SD	Post-test HRQoL Mean±SD	Significance
Question 1	4.30±0.651	4.77±0.430	0.002*
Question 2	4.23±0.728	4.87±0.346	0.000*
Domain 1–Physical health	27.03±3.399	29.20±3.662	0.006*
Domain 2–Psychological	24.00±2.901	26.53±3.391	0.000*
Domain 3–Social relationship	12.60±2.699	13.13±2.240	0.069
Domain 4–Environmental	35.13±4.400	37.23±2.487	0.002*

P*<0.05. SD: Standard deviationTable 4: Difference in improvement between two groups (unpaired sample *t*-test)**

Domain	Group	<i>n</i>	Mean	Standard deviation	Sig.
Question 1	Group A	36	0.0278	0.84468	0.028*
	Group B	30	0.4667	0.73030	
Question 2	Group A	36	0.1111	0.94952	0.002*
	Group B	30	0.6333	0.71840	
Domain 1–Physical health	Group A	36	1.9444	1.86616	0.000*
	Group B	30	2.1667	3.98344	
Domain 2–Psychological	Group A	36	−0.1389	1.70968	0.001*
	Group B	30	2.5333	2.62262	
Domain 3–Social relationship	Group A	36	−0.0556	1.41309	0.253
	Group B	30	0.5333	1.54771	
Domain 4–Environmental	Group A	36	0.2500	1.31747	0.01*
	Group B	30	2.1000	3.30465	

**P*<0.05

Getting older is an innate process of life and accompanies gradual changes in metabolic activity of organs and disability in regeneration capacity of cells.^[9] The average lifespan worldwide has been tremendously increasing due to various innovations in medical and health-care sectors. Apart from this, several other factors including genetics, healthy lifestyle, and diet, avoiding addictions, namely, smoking, tobacco chewing, and alcoholism and daily physical activity can effect on the longevity of life. Elderly individuals have higher incidences of having multiple health problems, leading to reduced physical and mental functions and so they need special care services to maintain high level of QOL and health status. The present study reflects that, in comparison to the control group, elderly individuals who participated in an 8-week 3SRB technique along with physical exercise program had significant improvement in HRQoL. The number of studies in literature has reported the beneficial effects of

physical exercise in elderly individuals. A study to find the effectiveness of 12 months multicomponent exercise program on physical performance, daily physical activities, and QOL was carried out on elderly individuals with minor disabilities by Taguchi *et al.* which concluded that the physical exercise program helps in improving the muscle strength and sit-and-reach distance along with maintaining the walking speed and distance, and stride length compared to control group.^[10]

3SRB is an ancient technique of self-realization which has been originated from Yoga Sutra of Sage Patanjali, the oldest and most comprehensive text on yoga.^[11] He breathing is called rhythmic because it follows a certain rhythm in nature that all planets, stars, suns, and the whole “Brahmanda” breathes, although at different speeds. The main purpose of the 3SRB rhythm is to synchronize the prana intake in the astral body to that of the intake of the breath in the physical body.^[12] 3SRB

technique facilitates one's physical, mental, emotional, and psychic health, i.e., the overall health of an individual. It helps to find peace of mind by reducing the turbulence of wrong and unwanted thoughts and slowly encourages one to embrace the good and higher path of life.^[13] Positive emotional changes in astral body slowly manifest in physical body and significantly help in normalizing various physiological systems in human body. Hence, they get new life and starts vibrating with energy at right frequency and rhythm.^[12] Physical exercise and 3SRB can be combined in improvement of different domains of health and well-being. According to the WHO, health is defined as a state of complete physical, social, mental, and spiritual well-being and not merely the absence of disease. While most of the intervention focus on improvement of an isolated dimension of well-being, the present study documents that the combination of different intervention has additive effect. While the first intervention, i.e., standard physical exercise is based on the principle of modern medicine, the second intervention is based on ancient wisdom of Indian culture. A positive state of complete health can be achieved only through incorporating collaborative wisdom of modern and ancient approaches.

The strength of the present research reveals and adds more scientific evidence about combined beneficial effects of well-being exercises founded on different schools of understanding of human physiology and psychology. This makes a justifiable argument for resorting to collaborative wisdom of the eastern and the western approaches in enhancing health. Moreover, researcher found limitation that it was done for shorter duration and immediate effect, so future study can be done on larger sample size and long-term effect of the technique.

CONCLUSION

Hence, the present study concludes that the outcome of the current study that is the special breathing technique has positive impact on QOL in elderly individuals. 3SRB technique increases awareness, stamina, and concentration levels and gradually reduces imaginary pressures such as competition, fear of failure, and worries about the future. It also reduces exhaustion, irritability, aggression, excitability, and depression, thus helping in enhancing the overall QOL, especially in elderly individuals.

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