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RESEARCH ARTICLE

The Effect of *Nadishodhana Pranayama* on *Dehabala* with special reference to *Udana Vayu*

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ABSTRACT

The present study was conducted to study the effect of *Nadishodhana Pranayama* on *Dehabala* in 100 volunteers which are *Ayurveda* college students from study area. *Udanavayu* is considered as *Pavanottama* as cited in *Sushruta Samhita*. *Bala* is a function of *Udana Vayu* stated by *Acharya Vagbhat.Bala* is very broad term in *Ayurveda.* In present study only physical strength was assessed by applying objective criteria these are Vital Capacity, Breath Holding Time and Harvard Step Test. *Pranayama* which is 4th step from *Astanga Yoga. Pranayama* means an art of control the vital force by breath. It is a breathing exercise regulating inward breath (inhalation) and exhalation. By regular practicing of *Pranayama* one can get good physical and mental health and efficacy in respiratory control. Life span of human being is depending upon it. If respiration rate of an individual is minimum, maximum will be the duration of life and vice versa. Now a days due to sedentary and indiscriminate lifestyle many disorders, health issues are occurring. All are not controlled by medicines, there is need of *Yoga* in which *Pranayama* plays an important role.

By inclusive and exclusive criteria selected volunteers were subjected to do *Nadishodhana Pranayama* daily 10 min for three months. Objective criteria parameters were assessed and noted before and after starting of *Pranayama.* Baseline data was collected and assessed statistically and clinically, significantly changes were found in all parameters. According to observations and results obtained it was concluded that the there was effect of *Nadishodhana Pranayama* on *Dehabala.*

Key Words *Nadishodhana Pranayama, Udana Vayu, Dehabala, Vital Capacity, Breath Holding Time, Harvard Step Test*

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INTRODUCTION

Nadishodhana Pranayama and *Dehabala* which are for strength and improvement in functions of many vital organs of body mainly Lungs and Heart. In present scenario we are suffering or going through COVID PANDEMIC. In which mainly respiration is getting affected. Patients are having breathlessness, dyspnea, throat infection, cough, vital capacity of lungs is reducing, SpO_2 is hampering. All respiratory symptoms are there, and other organs are also getting affected due to covid, in which patients of post covid suffering from MI, thrombosis, fungal infection, mucormycosis, weakness. To avoid all these

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symptoms or as a prevention for healthy respiratory system one must do regular breathing exercise. Prevention is better than cure and *Ayurveda* support this as stated in its purpose. Respiration which is getting affected is regulated by *Udanavayu* as per *Ayurveda.* In post covid severe weakness is there and *Bala* is a function of *Udana Vayu*. Due to hampering of *udanavayu* patients are suffering from it, are having weakness whether it is *sharir* or *manas bala.* My topic is for improvement of *Dehabala* (Physical Strength) by regular *Nadishodhana Pranayama* which is very much useful for avoiding such life-threatening diseases, for freshness, enthusiasm. Societies should get more awareness of *Pranayama* for healthy. Which is need of today's era.

Dehabala is Physical strength or ability to perform work without fatigue. specially *Bala* is function of *PrakrutaUdanavayu*. which provide to all *Dhatus* for their proper circulation. The flowing pattern of *Prana*is called as *Nadis.* The meaning of *Nadishodhana Pranayama* is-

Nadi-Flow of Energy/ channel.

Shodhana-Purification/Clear/Filtrate.

Due to regular practice of *Nadishodhana Pranayama* purification of all channels of body occurs

AIMS AND OBJECTIVES

Aim-To study the effect of *Nadishodhana Pranayama* on*Dehabala*

Objectives–

1.Study of *Dehabala*with special reference toUdana Vayu.

2.Observational study on effect of *NadishodhanaPranayama* on*dehabala.*

3.Conceptual study of relation between *Udana Vayu* and *Nadishodhana Pranayama.*

REVIEW OF LITERATURE

Udana Vayu

According to *Acharya Sushruta* the type of *vatadosha* which is having upward direction is an *Udana Vayu*[1]. It is located at Umbilicus *(Nabhipradesh),* chest or Thoracic region(*urah*), and neck (*Kantha*)[2]. According to *Sharangdhara*, Lungs supports*UdanaVayu*[3].

Functions of *Udana Vayu* are *Vak-pravrutti* (Speech), *Prayatna* (efforts to start any work), *Urja* (Energy), *Bala* (Physical strength to carry out any work), *Varna* (skin complexion)[4]. Whatever diseases above shoulder level observed are due to vitiation of *Udanavayu*. All E.N.T. diseases and many more include in this category[5].

Bala

Bala means strength it is an ability to do activity by means of physical and mental efforts. *Ayurveda* has got its basic concept of *bala* in relation to the health and illness condition. *Acharya charaka* says that *Kapha* in normal condition can be called as *bala*[6].

Acharya Sushruta defined *bala* as the core of all the dhatus developing from *rasa* up to *shukra* is known as *Oja* and that is *bala*[7]. According to

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Acharya Charakabala is of three types as follow[8] :

a) *Sahaj bala* is the *bala* of person since birth.

b) *Kalajabala* is the *bala* of person due to the season

c) *Yuktikrutabala* is the *bala* which the person acquires in his life.

Acharya charaka in *Vimansthana* stated that *Bala* can be measured with the help of *vyayama*[8] (physical exercises or activity) as a subject for making an *anumana* (prospect) about the capacity of an individual. Some scholars also term *bala* as *Kriya samarthya* that is the skill to do the activities.According to *sharandhara, Oja* is nothing but the strength and nourisher of the body[9]. *Ayurveda* recommend some factors to increase *bala* they are called as *balavriddhikarabhavas*.

Physical fitness[10]

Physical fitness is defined as a general state of health and specifically the capability to perform aspects sports or professions. To attain good strength, person should correct nutrition by follow dietary guidelines. he should exercise regularly. he should take proper hygiene and adequate rest. There are some factors which affects the physical performance are age, temperament, diet, somatotype and drugs. Also, some other factors can affect performance such as psychological, physical factors, or external factors.

Pranayama

The word *Pranayama* is formed by two words that is *Prana* and *Ayama*.

Prana- A subtle life force/vital force which provides energy to different organs (including mind) also controls many vital processes.

Ayama- indicates the voluntary attempt to regulate and direct this, *Prana*.

Pranayama is an art of control vital force by breath. According to *Patanjali*, conscious efforts to prolong and control the process of inhalation and exhalation is called as *Pranayama*[11]. *Ashtanga Yoga* of *Patanjali* also considers *pranayama* as step four in the comprehensive practice of *Yoga*[12]. By *pranayama* it increases concentration, achieve mental stability. *Pranayama* helps to control mental and physical activities. It reduces respiration rate and this results in to increase in life span of an individual[13].

Nadhishodhana Pranayama

The flowing pattern of *prana* is called as *Nadi*. It is mentioned in *yogic* text there are about 7.2 Million '*Nadis'* or 'Nerve Passages' in the human body. *Patanajali* said that by following all rules of *Yama, Niyama* and when you get command over *Asanas* then only you can perform *Pranayama* easily. It is also called as, *Anuloma-Viloma Pranayama. Malashodhaka Pranayama. NadishudhiPranayama.* Alternate Nostril Breathing.

Hath Yoga pradipika mentioned 3 phases of *pranayama* these are-

1) *Puraka* (Inhalation)
2) *Kumbhaka* (Pause or Breath-Holding)
3) *Rechaka* (Exhalation)

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Table 1 Duration of *Nadishodhana Pranayama*

References	Duration
YogchudamaniUpanishada	2 months
Shandilyopanishada	3/4/7 months
Yogtatvopanishada	3 months
Hatha Pradipika	3 months
Shiv Samhita	2/3 months

As mentioned in table no.1 *Hath Yogapradipikakar* stated that due to regular practice of this *Pranayama* purification of all channels of body occurs. Then one can experience following symptoms[14].

1. It gives physical and mental Strength.
2. Increases the vitality, stimulates *Agni* and appetite.
3. Increases Glow or Luster on the face.
4. Improves health.
5. Decreases weight.
6. Lowers the Stress and Anxiety by harmonizing *Prana.*

Modern aspect of *Pranayama*

In present era *Yoga* has become famous all over the world after understanding its importance for healthy and peaceful life. Since the breathing is done through only one nostril at a time during *Puraka* (Inspiration) and *Rechaka* (Expiration), the minute ventilation is reduced. Another reason for this is the controlled prolongation of both the phases as per the ratio. The amount of air reaching the lung is restricted while the volume of the blood being circulated in the lungs remains unchanged. That is, the ratio between air and blood volume in the lungs is altered. The gaseous exchange, there-fore takes place more efficiently. The recognition is directed for the breathing process which lowers the perception of the troubling sensory responses from the external atmosphere. This helps one to become more sensitive to and conscious of the flow of the air in the beginning and later on the inner happenings. This will also rebuild the biological, steady rhythm and equilibrium in the nasal cycle phenomenon. It purifies all the neural functions and therefore it is essentially practiced before other *Pranayamas*.

Benefits of *Nadishodhana Pranayama*

1) The *Pranayama* exercise is performed with an aim to balance central as well as autonomic nervous system and strengthen the lung functions to improve respiratory physiology.

2) It cleanses the respiratory passage that is nose, pharynx, larynx, trachea, and bronchial tree.

3) It increases the pulmonary volumes and capacities.

4) *Nadi Shodhana Pranayama* improves Pulmonary as well as cellular exchange of Oxygen and Carbon-dioxide.

5) After regular practice of *Pranayama*, it improves the elasticity of the lung tissue and its local resistance. The improved lung resistance prevents common respiratory disorders.

6) *Nadi Shodhana Pranayama* have beneficial effects on cardiovascular, pulmonary and higher function of brain.

7) *Pranayama* is not only lung exercise but also useful for control of mind. Hence all the sensory and brain functions get improve.

8) Improved gaseous exchange also helps to remove carbon-dioxide from blood and helps to maintain blood ph.

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9) *Pranayama* helps to concentrate the mind and to make the mind stable. Due to *Pranayama* one can control physical and mental activities. *Pranayama* reduces the respiratory rate by which body can conserve the vital energy and force. Outcome of this is the person becomes long lived with good quality of life.

MATERIALS AND METHODS

Type of study – An observational study

Place of study- *Ayurveda* college students from the area of study were selected.

Sample size- 100

Sampling technique - Simple random method

Consent- A well informed written consent of all patients included in my study was taken before starting the study

Ethical clearance- Clearance from ethical committee of the institution was taken

Selection of volunteers –

Inclusion criteria

- Healthy Volunteers from *Ayurveda* College.
- Students age between = 18yr. – 26yr.
- Students irrespective of Gender, Cast, Religion, Economic status.

Exclusion criteria

- Students with Respiratory, Cardiac or any systemic disorder.
- History of any physical or mental illness.
- Students with lack of interest.
- Students who do not practice *Pranayama*daily.
- Those with age less than 18 years and more than 26 years will be excluded.
- Under the influence of psychotropic drugs or substance abuse.

Withdrawal Criteria

- Those who are not willing for participation in this study can withdraw at any stage of study.

Objective parameters for assessment of *dehabala*

1) Harvard's Step Test
2) Vital Capacity
3) Breath Holding Time

Study instruments

1. HarvardStep Test: a. Harvard Step Bench
   b. Metronome
   c. stopwatch
2. Vital Capacity: Digital Spirometer.
3. Breath Holding Time: Stopwatch

The selected volunteers were gone through following procedure,

1) Each and every volunteer was examined
2) For *Dehabala* assessment before onset of *Nadishodhana Pranayama* Vital Capacity, Breath Holding Time and Harvard step test were done
3) Regular practice of *Nadishodhana Pranayama* was taken for 10 minutes for 3 months.
4) After 3 months of *Nadishodhana Pranayama* again Vital Capacity, Breath Holding Time and Harvard step test were done.

Details about objective parameters:

1. Harvard Step Test

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This is a physical fitness test for assessment of stamina. Proper procedure was explained to every volunteer as follows:

Subject step up and down at a rate of 30 steps per min, for men 20 inch height for 5 min and for female 18 inch height for 4 min. The examination of pulse is done in recovery period, at an interval of 1-1.5 min,2-2.5min and 3-3.5 min. Classification of fitness by fatigue index is given below,

Table 2 Classification of fitness according to Fatigue Index[15]

Fatigue index	Grades	*SharirBala*
Below 55	Poor	*Alpabala*
55-64	Low average	*Madhyamabala*
65-79	Average	*Madhyamabala*
80-89	Good	*Uttamabala*
Above 89	Excellent	*Uttamabala*

As stated in table.no.2 by this PFI of every individual PFI gradation was noted before and after *pranayama*.

1. Vital capacity

Vital capacity is the maximum volume of air that can be expelled out of lungs forcefully after a maximal or deep inspiration.

Normal Value: VC= IRV+TV+ERV = 3300+500+1000 = 4800 ml

This was done with digital spirometry machine.

This procedure was conducted before after *pranayama* and changes were note down

2. Breath Holding Time

Breath holding time is a time interval between holding the breath and breaking point during voluntary breath holding. Normal value= 45-55 seconds

Different individuals can hold their breath for variable periods of time depending on the functional status of the lungs, development of respiratory muscles, practice, age, sex. Details regarding procedure of Breath-Holding Time was explained to every volunteer. This procedure was done before and after *pranayama*.

Process of *Nadishodhana Pranayama*

Every day the volunteers were asked to perform *Nadishodhana Pranayama* for 10 minutes under personal supervision. This procedure was carried out for total timeperiodof 3 months.

OBSERVATIONS AND RESULTS

The above said objective parameters of the study were recorded without any bias and the gained results were arranged in the tabular, pie chart format and the outcomes are evaluated statistically

A) Sample Size

100 participants were continued throughout study there was not any dropped out of sample so therefore patients included in this study was 100%

B) Age

In present study maximum that is 46% of students were from age group 24-26; 44% students were from age group 18-20; while 10% were from 21-23 age group.

c)Gender

The present study shows that maximum number of female students that is about 75% whereas male students are about 25%.

D) Diet

Students participated in this study, that is about 60% were having mixed type of diet that is

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including veg and non-veg diet and remaining 40% students were pure vegetarian.

E) Sleep

99% of students were having normal sleep there was no any problem in sleeping pattern; only 1% were having disturbed sleep pattern.

F) Education: Participated students in presents study mostly they were undergraduate students that is about 54%. Whereas 46% of students were from post-graduation.

G) Marital status

In present study about 94% of students were unmarried only 6% of students were married.

Statistical Analysis in Objective Parameters

Table 3 Students paired t Test

Parameter	BP/AP	N	Mean	SD	T	P
Vital Capacity (in liter)	**BP**	**100**	3.901	0.69	13.228	< .00001
	AP	**100**	4.38	0.62		
Breath holding time (BHT) (in seconds)	**BP**	**100**	34.27	14.01	19.418	< .00001
	AP	**100**	53.52	11.79		
Harvard step test (HST)	**BP**	**100**	18.38	7.047	19.604	< .00001
	AP	**100**	31.64	9.18		

A) Vital Capacity

As shown in table no. 3, value of p is less than 0.05, significant difference was observed between mean of before and after *Pranayama* on Vital Capacity. Hence it is concluded that *Nadishodhana Pranayama* is significantly effective to increase **Vital Capacity**.

B) Breath holding time

As shown in table no. 3, value of p is less than 0.05, significant difference was observed between mean of before and after *Pranayama* on BHT. Hence it is concluded that *Nadishodhana Pranayama* is significantly effective to increase **Breath Holding Time**.

C) Harvard step test

As shown in table no. 3, value of p is less than 0.05, significant difference was observed between mean of before and after *Pranayama on* HST. Hence it is concluded that *Nadishodhana Pranayama* is significantly effective to increase **Harvard Step Test**.

Change in before and after *Pranayama* in Objective parameters

Table 4 Change in before and after *Pranayama* in Objective parameters

Sr. No.	Objective parameters	Change	
		Average Change	Percentage Change
1	**Vital Capacity**	0.475	12.17
2	**Breath holding time**	19.25	56.17
3	**Harvard step test**	13.26	72.18

Further to find the effect of *Nadishodhana Pranayama* on *Dehabala* between before and after *pranayama*, Paired t Test to the quantitative data was applied. For every statistical analysis, significance level accepted at 5% at 95% confidence limit.

Interpretation-

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As mentioned in table no.3, value of p is far less than 0.05, extremely significant difference was observed between mean of before *pranayama* and after *Pranayama* score in *Nadishodhana pranayama.* Hence there is effect of *Nadishodhana Pranayama* on *Dehabala.*

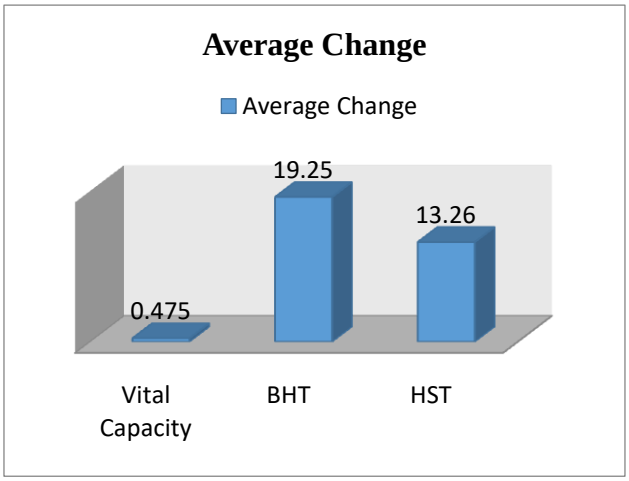

Figure 1 Avg. change in before and after *Pranayama* in objective parameters

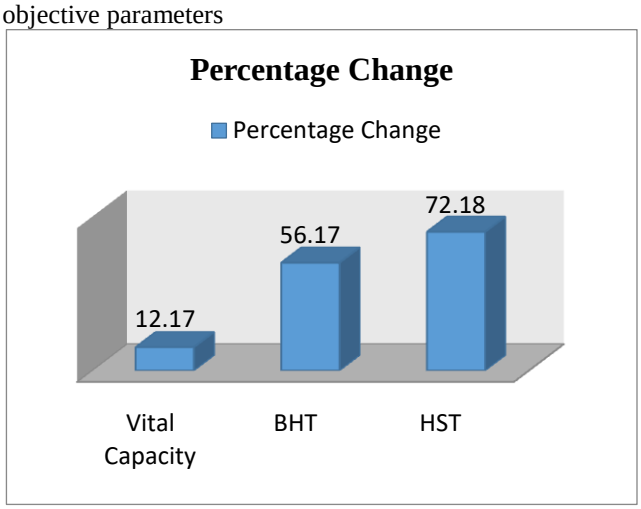

Figure 2 %Change in Objective Parameters

Overall Effect of Therapy

Table 5 Overall Effect of Therapy as per Statistical analysis

Sr. No.	Objective Parameter	Paired t test
1	**Vital Capacity**	Significant
2	**Breath holding time**	Significant
3	**Harvard step test**	Significant

DISSCUSSION

In present situation of pandemic everyone is suffering from respiratory problems whether it is mild or severe, vital capacity is getting hampered ultimately it hampers strength of an individual which mainly depends upon vital organs like lungs, heart etc. To avoid this there is need to keep healthy respiratory tract. Cleansing of tract is much important and which can be done by proper breathing exercises. There-fore one should do regular practice of *pranayama*. Control on respiration is one of the eight division of *Yoga*-Practice. In classic *vedic* text there is more elaboration about *pranayama* such as its types, effects on body, when to start, how to start, duration for which one can perform *pranayama*. If an individual practices *pranayama* by proper steps or as prescribed it will keep away him/her from respiratory disorders, stops aging process, improves digestive power, lusture etc.

Bala is very broad concept explained in *Ayurveda*. There are various types of *bala* like *Sahaja bala, Kalajabala, Yuktikrutabala, Dehabala, Manobala, Atmabala, Indriyabala, deshabala, Rugnabala, Vyadhibala* etc. among these in present study we had learned about *Dehabala* which is a physical strength, an ability of an individual to perform work. According to *yogic* text physical energy is derived from *Asana* and *Pranayama*. *Pranayama* helps to improve physical strength by providing oxygen to each organ like heart, lungs, kidneys, liver etc which will improve the function at minute level that is

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from cell ultimately organs stay in healthy conditions and this leads to proper healthy life.

Total 100 students were selected from *Ayurveda* college according to inclusive criteria. For the evaluation of result, assessment of *dehabala* was done with the help of parameters. The results obtained from assessments were statistically analyzed and calculated. The results obtain in this study are discussing as follows:

Sample size – In present study 100 students were selected according to inclusive criteria and all 100 participants were continued throughout study, there were no any dropped out there-fore volunteers included in this study was 100%.

Age – According to inclusive criteria age group is from 18-26. In present study maximum that is 46% of students were from age group 24-26; 44% students were from age group 18-20; while 10% were from 21-23 age group. In this age group there is more physical, mental, emotional development take place. My study population were doctors which are in phase of study, carrier oriented, future planning thus, there is need of much physical strength to keep themselves active by recommending proper diet, physical exercise, breathing exercise at this age will improve their *dehabala.*

Gender - The present study shows that maximum number of female students that is about 75% were get participated whereas male students are about 25%.

Diet - About 60% were having mixed type of diet that is including veg and non-veg diet and remaining 40% students were pure vegetarian. This may due to demographic factor. In *Ayurveda* explained relation between diet and *Bala* as it is a *Balavruddhikar bhava* (element to improve strength).

Sleep - About 99% of students were having normal sleep there was no any problem in sleeping pattern; only 1% were having disturbed sleep pattern. *Ayurveda* stated relation of sound sleep and strength. It relaxes organs, reduces stress, healing occurs whether it is physical or mental, gives rest to each and every organ which provide strength to body.

Education – In presents study, about 54% were undergraduate. Whereas 46% of students were from post-graduation.

Marital status - In present study about 94% of students were unmarried only 6% of students were married.

Discussion on parameters of *Dehabala*

The analysis of values obtained from objective criteria of *Dehabala* was done using students paired t-test as the data obtained was quantitative type. The objective values obtained was assessed by applying students paired t-test for vital capacity, breath holding time, Harvard step test.

a) Discussion on Vital capacity

Vital capacity is the maximum amount of air a person can expel from the lungs after initially filling the lungs to their greatest extent and then expiring to the maximum extent. It is a means by which we can assess pulmonary efficiency on which strength, functioning of lungs are dependent. Normal vital capacity is 4-5 lit,

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alteration in this value suggest any pathological condition.

In present study it was observed that irrespective of gender only 27% students had normal vital capacity that is between 4-5lit before starting of *pranayama*. From which all male volunteers had normal vital capacity whereas only 4% female students were under normal vital capacity. After *pranayama* it was observed that about 24% students were not able to reach up to normal vital capacity but there was increase in value than before *pranayama*.

As mentioned in table no.3, In present study mean of Vital capacity before *pranayama* and after *pranayama* was 3.901 and 4.38 with SD 0.69 and 0.62 respectively.

As mentioned in table no.4, fig.no.1 and fig.no.2 the average and percentage changes in vital capacity were respectively 0.475 and 12.17.

As mentioned in table no.3, When student's paired t-test was applied to observations that is before *pranayama* and after *pranayama*. It shows the value of 't' calculated is significant at $p<0.00001$. As value of p is less than 0.05, significant difference was observed between mean of before and after *Pranayama* on Vital Capacity. Hence it is concluded that *Nadishodhana Pranayama* is significantly effective to increase **Vital Capacity** as mentioned in table no.5.

b) Breath holding time

It is an ability of an individual to retain or hold breath to some extent from which we can assess cardio-pulmonary efficiency. It varies from 45-55 seconds. During study it was observed that only 14% students had breath holding time above 45 seconds before starting of *pranayama*. After practice of 3 months of *Nadishodhana Pranayama* there was extreme change was observed in breath holding time. As mentioned in table no.3, In the present study mean of breath holding time before *pranayama* and after *pranayama* was 34.27 and 53.52 with SD 14.01 and 11.79, respectively.

As mentioned in table no.4, fig. no.1 and fig. no.2 the average and percentage changes in breath holding time were respectively 19.25 and 56.17.

As mentioned in table no.3, When student's paired t-test was applied to observations that is before *pranayama* and after *pranayama*. It shows the value of 't' calculated is significant at $p<0.00001$. As value of p is less than 0.05, significant difference was observed between mean of before and after *Pranayama* on BHT. Hence it is concluded that *Nadishodhana Pranayama* is significantly effective to increase **Breath Holding Time**.

c) Harvard step test

It is a physical fitness test for assessment of stamina or physical endurance through with we can guess about cardiac efficiency. In Harvard step test there is fatigue index through which we can grade students according to their strength for poor category value of fatigue index is below 55. When study was going on, I was taking this test before starting of *pranayama*, it was observed that all students are in poor category, duration of exercise for test is less i.e. they stop step up

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before 4 or 5 min, early exhaustion was found, more increase in pulse rate were observed. After 3 months of *pranayama practice* only 2 students came under Low average grade. In observation it was found that, other volunteers showed increase in duration of exercise at least they performed their exercise for given time, early exhaustion was decreased for some extent, decreased in pulse rate also observed.

As mentioned in table no.3, In present study mean of Harvard step test before *pranayama* and after *pranayama* was 18.38 and 31.64 with SD 7.047 and 9.18, respectively.

As mentioned in table no.4, fig. no.1 and fig. no.2 the average and percentage changes in Harvard step test were respectively 13.26 and 72.18.

As mentioned in table no.3, When student's paired t-test was applied to observations that is before *pranayama* and after *pranayama*. It shows the value of 't' calculated is significant at p<0.00001.s

As value of p is less than 0.05, significant difference was observed between mean of before and after *Pranayama on* HST. Hence it is concluded that *Nadishodhana Pranayama* is significantly effective to increase **Harvard Step Test**.

Discussion on average and percentage changes in objective parameters of *Dehabala*

As mentioned in table no.4, fig.no.1 and fig.no.2 In present study data was obtained before and after practice of *Nadishodhana pranayama* in terms of Vital Capacity, Breath holding time, Harvard step test. Average change and percentage changes were as follows:

Among average change, more changes were observed in Breath holding time that was about 19.25 than rest of two parameters and in percentage change it was more in Harvard step test about 72.18% than breath holding time and vital capacity. In vital capacity both average and percentage changes are lower, but it was observed that by practicing 3 months of *Nadishodhanaparanayama* it brought vital capacity to normal in those volunteers who were having very poor vital capacity

Statistical analysis

As shown in table no. 5, The information gathered on the basis of observation made about various parameters is subjected to statistical analysis in terms of Mean, Standard Deviation (SD). Students paired 't' test was applied to carried out for the statistical significance. The results were interpreted at p<0.05, p<0.01 and p<0.001 significance level

The obtained results were interpreted as –

Insignificant - P > 0.05

Significant - P < 0.05

Highly significant - P < 0.01

For every statistical analysis, significance level accepted at 5% at 95% confidence limit.

Interpretation was done as-

As value of p is far less than 0.05, extremely significant difference was observed between mean of Before *pranayama* and After *Pranayama* score in *Nadishodhana pranayama.*

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Hence there is effect of *Nadishodhana Pranayama* on *Dehabala*.

CONCLUSION

After going through a cautious practical and theoretical study and detailed conceptual literature, statistical analysis and discussion following conclusion were drown from the study.

- In the present study, statistically there was significant association between *Dehabala* and *Nadishodhana Pranayama.*
- At the beginning of study and after practicing of *Nadishodhana Pranayama* objective parameters for assessment of *Dehabala* by vital capacity, breath holding time, Harvard step test were done. From which Vital Capacity is lower and it increased and came to normal. As compared to female; male volunteers had normal vital capacity.
- Breath holding time also increased, in Harvard step test all were under poor grade; they remain under poor grade except 2% students. But there was decrease in early exhaustion, decreased in pulse rate increased in duration of exercise.

By above observation we can conclude that *NadishodhanaParanayama* has effect on to increase Vital capacity, breath holding time and fatigue index of Harvard step test.

- The study enlightened the importance of *pranayama* in day-to-day life to keep ourselves healthy. Regular practice of it has beneficial effects on various body systems. In current scenario of COVID-19 it has too much importance. So, everyone must include *pranayama* in their daily schedule to keep physically and mentally fit.
- **Further scope of study** – in present study limited students were included for the further study we can include large population. In different racial population and in different geometrical area this study can be done.

RESEARCH ARTICLE

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