



# **Effectiveness of yoga therapy on quality of life after long covid-19 in health care workers: An Experimental study A SYNOPSIS SUBMITTED TOWARDS PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE FINAL YEAR UNIVERSITY EXAMINATION OF BACHELOR OF PHYSIOTHERAPY**

SUBMITTED BY:  
**TEJAL BHOSALE**

## **INTRODUCTION**

The world has been hit by a global pandemic condition COVID-19, also known as coronavirus pandemic. The primary organ affected by corona virus are lungs but it affects functions of many organs.

“Long covid” is a term being used to describe illness in people who have either recovered from covid-19 but are still report lasting effects of the infection or have had the usual symptoms for far longer than it would be expected. According to the NICE guidelines on managing the long-term effects of covid-19 and the CDC<sup>10</sup> define long covid patients as individuals with ongoing symptoms of covid-19 that persist beyond four weeks from initial infection.<sup>(1)</sup>

A study on Long Covid stated that about 87.4% of people reported feeling at least one persistent symptom and the most common was chronic fatigue and shortness of breath.<sup>(3)</sup>

Approximately 50-70% of patients hospitalized express some symptoms of Covid-19 for up to three months after completing treatment and being discharged from the hospital.<sup>(3)</sup>

According to literature from SARS or Ebola epidemics, the onset of a sudden and immediately life-threatening illness could lead to exceptional levels of pressure on healthcare workers (HCWs). Increased workload, physical pressure, isolation and loss of social support, inadequate protective measures, professional viral transmission, and unprecedented ethical concerns on the rationing of care may have important consequences on their personal physical and mental well-being. <sup>(1)</sup>

Current literature describes that HCWs on the front line have proven to be more at risk of developing psychological symptoms and mental health disorders. <sup>(1)</sup>

A Health care worker is one who delivers care and services to sick and ailing either directly as doctors and nurses or indirectly as aides, helpers, laboratory technicians, or even medical waste handlers.

Frontline workers are, in fact, directly responsible in caring process of patients with COVID-19 and have to face peculiar psychosocial risk factor such as the depletion of PPE, lack of specific guidelines of treatment, and feeling of being inadequately supported, which may all contribute to their mental burden. <sup>(1)</sup>

### **Long COVID Symptoms**

Some patients are experiencing prolonged multiorgan symptoms and complications beyond their initial period of acute infection and illness.

The list of persisting and new symptoms reported by patients is extensive, including chronic cough, shortness of breath, chest tightness, cognitive dysfunction, and extreme fatigue.

According to NICE guidelines there are 2 definitions of post covid 19 are-

Ongoing symptomatic COVID-19 for people who still have symptoms between 4 and 12 weeks after the start of acute symptoms.

Post COVID-19 syndrome for people who still have symptoms for more than 12 weeks after the start of acute symptoms. <sup>(5)</sup>

### **Yoga therapy for covid-19 rehabilitation**

Most of patients who had COVID are reporting high levels of fatigue and respiratory distress even after discharge from the hospital and first 6-8 weeks may be very crucial in this regard. <sup>(2)</sup>

Hence, we need to focus on exercise strategies which have low energy expenditure and still focus on strength, conditioning and improved respiratory and cognitive functions The stretching and maintaining of

end range position additionally stimulates proprioception and flexibility. Working on the endurance of core muscles to improve overall stability and endurance.

Yoga asanas can aid better functions of visceral organs and also help to load diaphragm and improve respiratory function. Yogic asanas and pranayama have been proven to be effective in this regard from ages and provide answer to all physical exercise and psychosocial rehabilitation needs of the world. Yoga as an exercise method may be one of the best strategies to achieve all these benefits. <sup>(2)</sup> Yoga practices improve quality of life by promoting muscle strength, flexibility, improving respiratory and cardiac function, reducing stress anxiety and improving sleep.

## NEED OF STUDY

- Yoga may be viewed as gentle form of exercise that may be tolerated easily.
- Yoga practices improve quality of life by promoting muscle strength, flexibility, improving respiratory and cardiac function, reducing stress, anxiety and improving sleep. <sup>(1)</sup>
- There are few studies done on effectiveness of yoga therapy in post covid front line workers. Hence there is need to find out the effectiveness of yoga therapy on quality of life in health care workers after long covid-19.

## Aim

Effectiveness of yoga therapy on quality of life after long covid-19 in health care workers over the period of 6 weeks with respect to quality of life..

## OBJECTIVE

To find out effectiveness of yoga therapy on quality of life after long Covid 19 in health care workers by using SF 36 questionnaires over the period of 6 weeks with respect to quality of life.

## HYPOTHESIS

Null hypothesis (H<sub>0</sub>): There is no significant effect of yoga therapy after long covid 19 in health care workers over the period of 6 weeks with respect to quality of life.

Alternative hypothesis (H<sub>1</sub>): There is significant effect of yoga therapy after long covid 19 in health care workers over the period of 6 weeks with respect to quality of life.

## REVIEW OF LITERATURE

1) Bhawana, Vandana, Dr.Z S Kundu; in their study 'Exercise and Yoga as Modalities for Post Covid 19 Rehabilitation' found that Rehabilitation program play a vital role in post discharge patients with coronavirus disease. Yoga play a tremendous role in post COVID-19, which reduces psychological stress may had an important role to play in strengthening the immune system thereby reducing spread of a reducing infection and preventing complications. Consistent practice of yogic breathing technique's increases the lung's airflow, air capacity, stamina and efficiency. It helps in improving overall lung function in patients with chronic obstructive pulmonary disease.

(International Journal of Science And Research)

2) Shruti S, Mark O, Amy J et al; in their study Potential for integration yoga within pulmonary rehabilitation and recommendations of reporting framework stated that, Yoga primarily can focus on core strengthening, breathing control, mindfulness and self-awareness. Yoga has therapeutic effects on various pathological conditions and there is a strong evidence of effectiveness of yoga on management of COPD. Yoga is a holistic approach with aims, components and outcome measures complementary to those of pulmonary rehabilitation.

-(BMJ Open respiratory research)

## METHODOLOGY

- Study design- Experimental study
- Sample size- 62
- Study population- long covid-19 patients (both male and females)
- Study setting- Hospitals and institution in and around Pune
- Duration of study- 6 months
- Duration of intervention- 60 mins / 2 times in a week/ 6weeks

## CRITERIA

### Inclusion

- Health care workers who still have symptoms for more than 12 weeks after the start of acute symptoms
- Age 18 yrs. – 40yrs
- both genders male and female

### Exclusion

- Diagnosed previously with any cardio-respiratory conditions or any co morbidities
- Recent injuries related to soft tissues
- Recent fractures related to upper limb, lower limb and spine
- Sacroiliac joint dysfunction
- h/o of neurological conditions

### MATERIALS

- Pen
- paper
- yoga mat
- SF 36 scale

### OUTCOME MEASURE

SF 36 scale (ICC:0.92)

### PROCEDURE

- The study was conducted after obtaining clearance from ethical committee of the P.E.S Modern college of physiotherapy in Pune India.
- The participants were screened for study criteria and they were briefed about the study.
- Informed consent was taken from patients who will be willing to participate in the study.
- All the participants had received yoga therapy exercises for 6 weeks.
- Pre and post treatment assessment was done by using SF-36 quality of life scale.

## YOGA THERAPY EXERCISE INCLUDES

### ❖ Initial 2 weeks

- Pranayama- Pranayama based breathing exercises are easy method to improve diaphragmatic breathing and improve gas exchange in lungs.
- Asanas
- Ardha pavanmuktasana
- Supta Matsyendrasana
- Setubandhasana- Working on the endurance of core muscles.
- Marjariasana- to improve overall stability and endurance.
- Balasana- aid better functioning of visceral organs and also help to load diaphragm and improve respiratory function.

### ❖ 2 to 4 weeks (new addition)

- Anulom Vilompranayama
- vajrasana
- Matsyendrasana - chest expansion by improving thoracic mobility.
- Paschimottanasana
- Bhujangasan
- Tadasan

### ❖ 4 to 6 weeks (new addition)

- Mandukasana
- Utkatasana
- Trikonasana
- Katichakrasa
- **Warm up:** will include stretching and free range of motion exercises 5-10 min.
- Proceed to yoga asanas.

Asanas was held for 15-30 seconds in beginning for 3-5 repetitions and gradually was progressed to 1 minutes. <sup>(1)</sup>

- Rest time of 1-2 min was given after each asana.

# Yoga asanas Initial 2 weeks

Pranayama



bhramari pranayama



Setu bandhasana



Ardhyanmuktasan



Supta Matsyendrasana



### Marjariasana



**2 to 4 weeks (new addition)**

### Vajrasana







Tadasana



4 to 6 weeks (new addition)

Mandukasana



Utkatasan



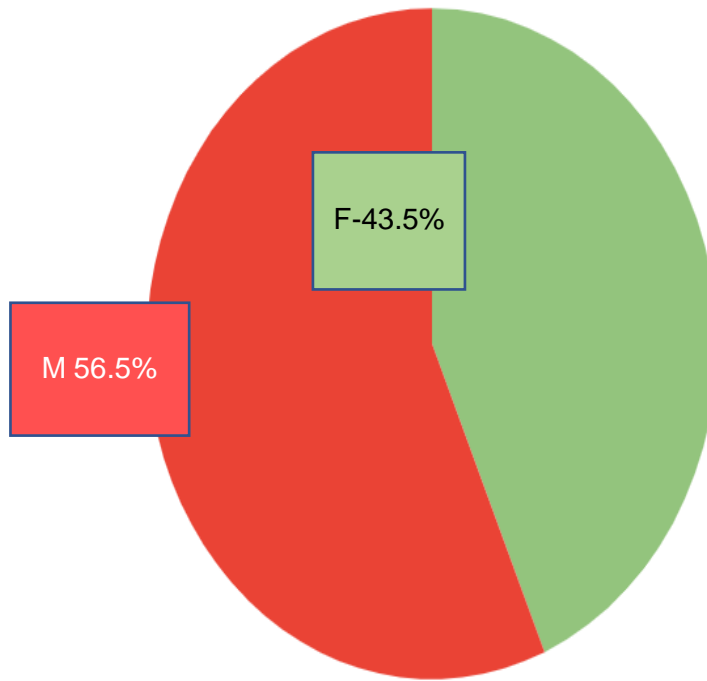
Trikonasan



Katichakrasan



## Gender distribution

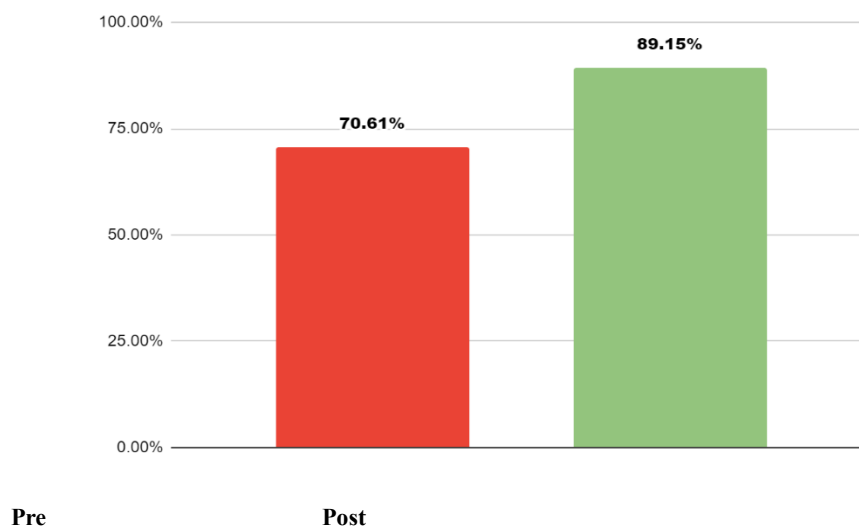


## Data analysis and interpretation

### Result

#### Physical function

Mean value	Pre SF36	Post SF36	Difference	t-value	P -value	Result
PHYSICAL FUNCTION	70.61%	89.15%	-17.667%	11.950	P < 0.0001	Extremely significant

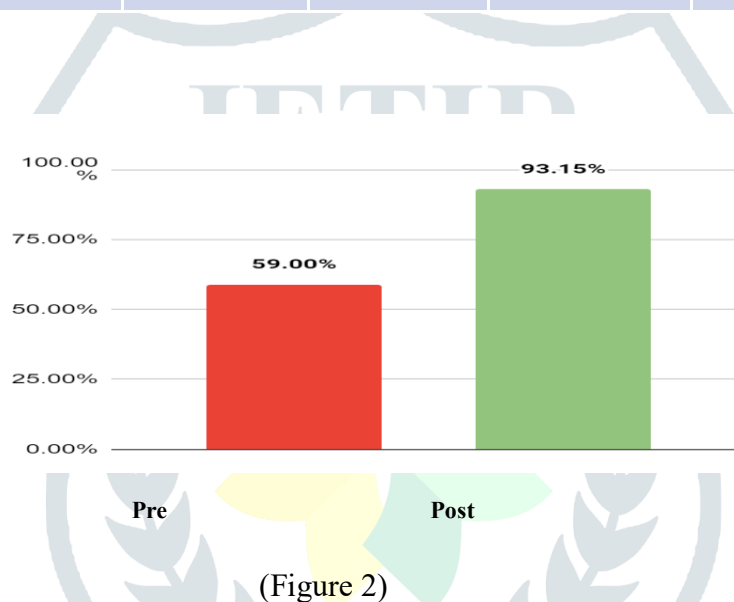


(Figure 1)

Graphical pre and post representation of physical function after long covid-19 in HCW's pre mean score is 70.61%, post mean score is 89.15% and mean difference is -17.667%,  $p < 0.0001$  i.e considered extremely significant. The increase mean score indicated that there is improvement in physical function.

### Physical function limitation

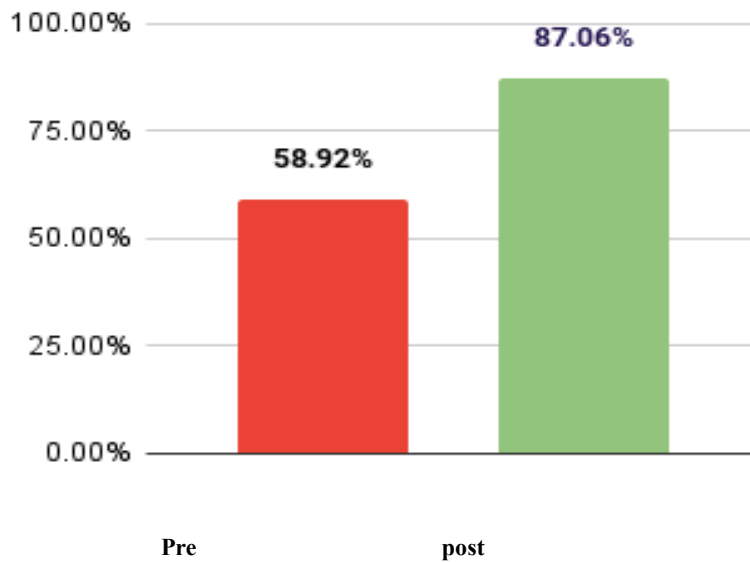
Mean value	Pre SF36 que	Post SF36 que	Difference	t-value	P value	Result
PHYSICAL FUNCTION ROLE LIMITATION	59.00%	93.15%	-34.145%	10.051	$P < 0.0001$	Extremely significant



Graphical pre and post representation of physical function limitations after long covid-19 in HCW's pre mean score is 59.00%, post mean score is 93.15% and difference is -34.145%,  $p < 0.0001$  i.e considered extremely significant. . The increase mean score indicated that there is improvement in physical function role limitation.

### Emotional function limitation

Mean value	Pre SF36	Post SF36	Difference	t- value	P value	Result
Emotional FUNCTION LIMITATION	58.92%	87.06%	-28.145%	10.076	$P < 0.0001$	Extremely significant

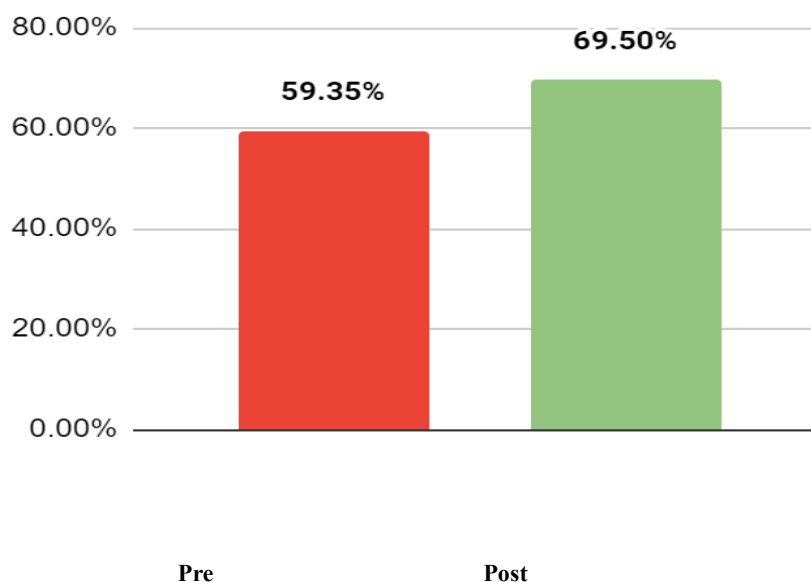


(Figure 3)

Graphical pre and post representation of general health after long covid-19 in HCW’s pre mean score is 58.92%, post mean score is 87.06% mean difference is -28.145%,  $p < 0.0001$  i.e considered extremely significant. The increase mean score indicated that there is improvement in emotional function role limitation.

**Energy/ Fatigue**

Mean value	Pre SF36	Post SF36	Difference	t -value	P- value	Result
ENERGY/ FATIGUE	59.35%	69.50%	-10.290%	8.637	P < 0.0001	Extremely significant



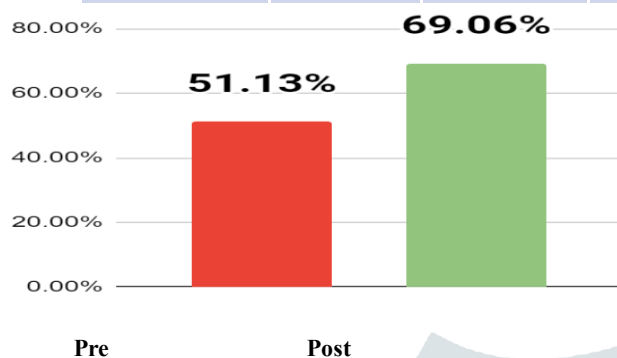
(Figure 4)

Graphical pre and post representation of energy/ fatigue after long covid-19 in HCW's pre mean score is 59.35%, post mean score is 69.50% mean difference is -10.290 %,  $P < 0.0001$  i.e considered extremely significant. . The increase mean score indicated that there is increase in energy and reduces fatigability.



**Social activity**

Mean value	Pre SF36	Post SF36	Difference	t -value	P- value	Result
SOCIAL ACTIVITY	51.13%	69.06%	-17.935%	7.671	P < 0.0001	Extremely significant

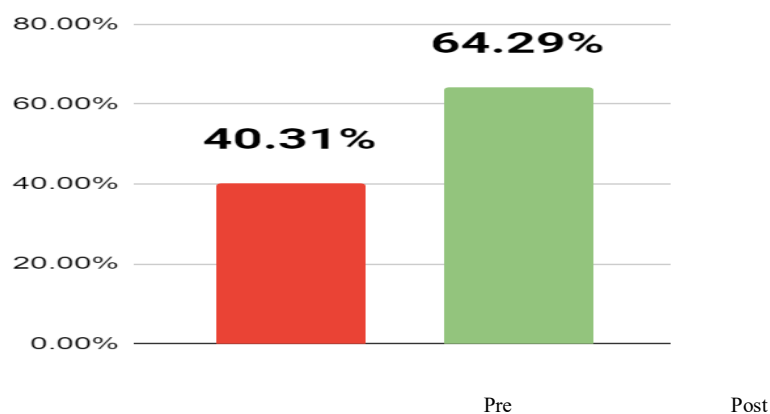


(Figure 5)

Graphical pre and post representation of general health after long covid-19 in HCW's pre mean score is 51.13%, post mean score is 69.06% mean difference is -17.935%,  $p < 0.0001$  i.e considered extremely significant. . The increase mean score indicated that there is improvement in social activity.

**Pain**

Mean value	Pre SF36	Post SF36	Difference	t -value	P- value	Result
PAIN	40.31%	64.29%	-23.984%	11.556	P < 0.0001	Extremely significant

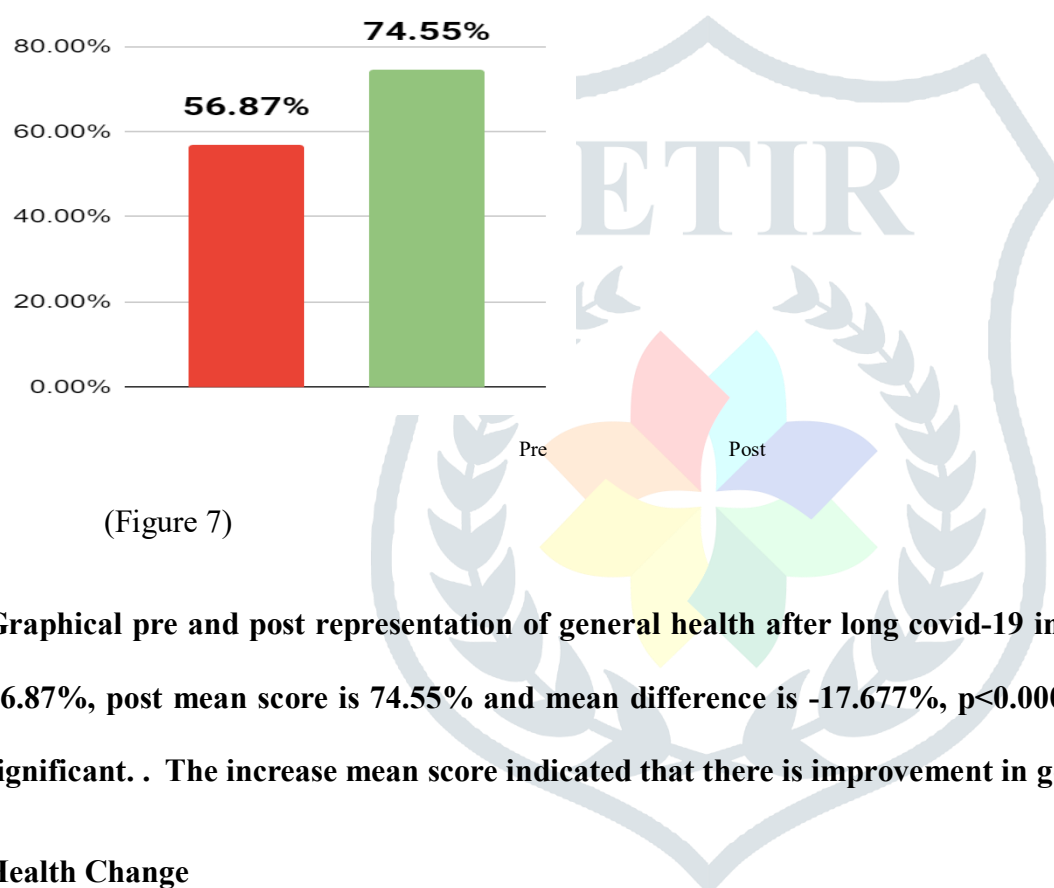


(Figure 6)

Graphical pre and post representation of general health after long covid-19 in HCW's pre mean score is 40.306%, post mean score is 64.290% and mean difference is- 23.984%,  $p < 0.0001$  i.e considered extremely significant. . The increase mean score indicated that pain is reduced.

### General Health

Mean value	Pre SF36	Post SF36	Difference	t -value	P- value	Result
GENERAL HEALTH	56.87%	74.55%	-17.677%	8.002	$P > 0.0001$	Extremely significant



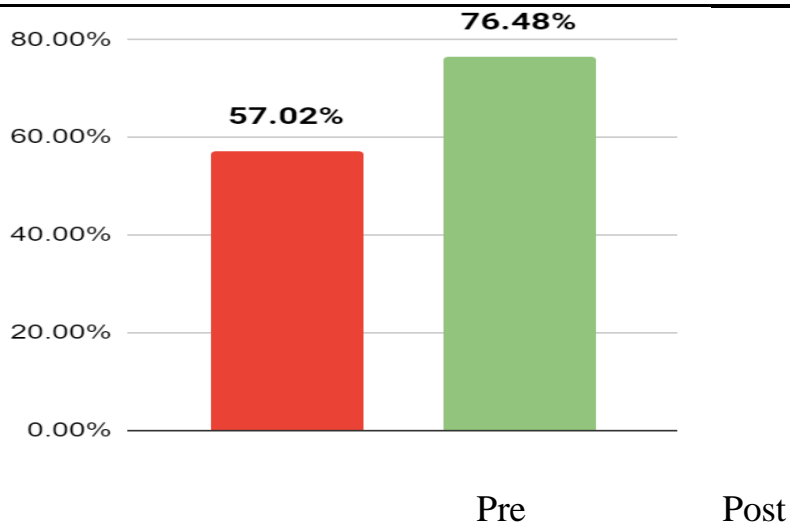
(Figure 7)

Graphical pre and post representation of general health after long covid-19 in HCW's pre mean score is 56.87%, post mean score is 74.55% and mean difference is -17.677%,  $p < 0.0001$  i.e considered extremely significant. . The increase mean score indicated that there is improvement in general health.

### Health Change

Mean value	Pre SF36	Post SF36	Difference	t -value	P- value	Result
HEALTH CHANGE	57.02%	76.48%	-19.468%	13.907	$P < 0.0001$	Extremely significant





(Figure 8)

Graphical pre and post representation of health change after long covid-19 in HCW's pre mean score is 57.02%, post mean score is 76.48% and mean difference is -19.468% ,  $p < 0.0001$  i.e considered extremely significant. . The increase mean score indicated that there is improvement in health.



## DISCUSSION

The present study was done to check Effectiveness of yoga therapy on quality of life after long covid-19 in health care workers. This study was an experimental study.

In this study total 62 participant were included both male and females age group 18 to 40 years. Participant having long covid symptoms i.e chronic cough, shortness of breath, chest tightness, cognitive dysfunction, and extreme fatigue.

In this study we found that yoga therapy had significant effect on improving quality of life after long covid-19 in HCW's.

In our study we included 5 to 10 minutes of warm up which included various yoga asanas in standing and sitting. The combination of asanas and pranayama (breathing techniques) is highly beneficial for HCW's. Yogic practices improve quality of life by promoting muscle strength and improving quality of living.

Slow movements and deep breathing increases blood flow and warm up muscles, while holding a pose can build strength which improves physical functions and role limitations due to physical activities. It improves mental health by increasing brain chemicals and improves self-image and confidence thus improving mental health.<sup>(7)</sup>

Yoga practices can increase multiple neurotransmitters and hormones such as GABA, serotonin, and dopamine—all natural anti-depressants. They have been shown to increase levels of melatonin, helping to initiate sleep, improving sleep quality and sleep regulation, as well as increasing levels of oxytocin, the “bonding hormone”, helping with feelings of connectedness and “being seen and heard”<sup>(7)</sup> thus there is improvement in emotional health as well as social activities. GABA is one of the body's chief inhibitory neurotransmitters, working to reduce neuronal excitability and activity throughout the central nervous system (CNS). GABA acts as an important player in the body's response to stress, fear, depression, anxiety and sleep regulation.<sup>(7)</sup> Hence there was improvement in emotional function role and social activities.

Rehabilitation practitioners commonly encounter pain control issues. In many instances, besides the triggering factors that cause pain, pain is influenced by stress and depression.<sup>(8)</sup> Bodily pain was most common in HCW's.

Yogic practices improve quality of life by promoting muscle strength, flexibility, improving respiratory and cardiac function, reducing stress anxiety and improving sleep<sup>(1)</sup>

The data analysis was done using paired 't' test which showed p value for eight domains i.e. physical functioning, Physical functioning role limitation, Emotional Function Role Limitation, Social Activity, General Health, Health change, energy and fatigue domains  $p < 0.001$  which is extremely significant.

Pranayama based breathing exercises are easy method to improve diaphragmatic breathing and improve gas exchange in lungs.

Bhambri pranayama has been hypothesized to be of key importance in COVID-19. Asanas which emphasize on chest expansion by improving thoracic mobility like matsyendrasana and its variants can help additionally in this regard.<sup>(1)</sup> These asanas reduced stress, fear and anxiety.

Working on the endurance of core muscles with setubandhasana and marjariasana can help to improve overall stability and endurance. Balasana and pawanmuktasana can aid better functioning of visceral organs and also help to load diaphragm and improve respiratory function. Balasana may be a good pose to induce relaxation in events of breathlessness.<sup>(1)</sup>

Many studies have shown that viral attack affects one's immunity at first, where various biomarkers get either up or down-regulated. The human immune system might play a significant role in protecting an individual from getting COVID-19 infection.<sup>(10)</sup>

the maladjusted immune feedback mechanism might result in immunopathology and impaired pulmonary gas exchange. It is proposed that the Covid-19 virus infects macrophages, thus presenting COVID-19 antigens to T cells. Further, this progression leads to T cell activation and differentiation, along with the production of cytokines associated with the different T cell subsets. This subsequently leads to a massive vent of cytokines for immune response intensification.<sup>(10)</sup>

Previous study was done on Effect of Pranayama on Perceived Stress, Well Being and Quality of Life of Frontline Healthcare Professionals on Covid-19 Duty, pranayama session was done for 28 days in Health care workers beneficial effects as shown by significantly reduced Perceived stress score; increase in overall WHO- Quality of Life Score and significant increase in psychological domains of WHOQOL score, suggesting a positive effect of Pranayama sessions on HCPs on mental health.<sup>(11)</sup>

There are numerous explanatory pathways for the improvement with Pranayama on stress. Stress is known to suppress immune function and increase susceptibility to infections. Chronic stress is associated with global immuno-suppression. Increasing duration of stress can result in a shift from potentially adaptive changes to potentially detrimental changes, initially in cellular immunity and later and more broadly in immune function. <sup>(11)</sup>

Various mind and body therapies have been known to work as an adjunct treatment. Yogasana and meditation-subsets of mind-body therapies improve immunity and provide protection against respiratory tract infections (RTI). <sup>(10)</sup>

Yoga is well integrated in physiotherapy curriculum which provides physiotherapists with sound knowledge to implement yogic exercises during rehabilitation. <sup>(1)</sup>

## CONCLUSION

Yogic asanas and pranayama have been proven to be effective in this regard from ages and provide answer to all physical exercise and psychosocial rehabilitation needs of the world. <sup>(1)</sup>

The study Effectiveness of yoga therapy on quality of life after long covid-19 in health care workers after 6 weeks of research we found that yoga therapy shows significant effect on improving quality of life.

## LIMITATIONS

The exact severity of covid-19 condition was not known as many of them did not have their CT scan reports.

## FUTURE SCOPE OF STUDY

In in this study, it was observed that Bodily Pain was not reduced as compared to other domains i.e., physical function, physical function role limitation, emotional function role limitation, energy/fatigue, general health, health change, hence there is need to study management of bodily pain after long covid-19 in HCW's.

## REFERENCES

- 1) As recognition grows that many patients have long lasting effects, Elisabeth Mahase examines the evidence and the response
- 2) *BMJ* 2020; 370 doi: <https://doi.org/10.1136/bmj.m2815> (Published 14 July 2020) Cite this as: *BMJ* 2020;370:m2815
- 3) [https://www.researchgate.net/publication/351049906\\_Exercise\\_and\\_Yoga\\_as\\_Modalities\\_for\\_Post\\_COVID-19\\_Rehabilitation](https://www.researchgate.net/publication/351049906_Exercise_and_Yoga_as_Modalities_for_Post_COVID-19_Rehabilitation)

- 4) Long covid- mechanism,management,risk factors Cite this as: BMJ 2021;374:n1648  
<http://dx.doi.org/10.1136/bmj.n1648>
- 5) COVID-19 rapid guideline: managing the long-term effects of COVID-19 - NICE, RCGP, and SIGN  
 BMJ 2021; 372 doi: <https://doi.org/10.1136/bmj.n136> (Published 22 January 2021)Cite this  
 as: *BMJ* 2021;372:n136
- 6) NICE guideline on long covid, Priya venkatesan, THE LANCENT Respiratory medicine, VOLUME 9/ ISSUE  
 2,P129,FEBRUARY 01, 2021
- 7) Potential for integration yoga within pulmonary rehabilitation and recommendations of reporting framework,  
 Sahastrabuddhe SD, et al. *BMJ Open Res* 2021; 8 (1): e 000966. doi: 10.116/bmjresp-2021 000966.
- 8) <https://doi.org/10.3390/children4020012> Medical Yoga Therapy
- 9) [https://scholar.google.com/scholar?cluster=2831152377117233398&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1669109590373&u=%23p%3D9IATPxZGSicJ](https://scholar.google.com/scholar?cluster=2831152377117233398&hl=en&as_sdt=0,5#d=gs_qabs&t=1669109590373&u=%23p%3D9IATPxZGSicJ)
- 10) Website: [www.jfmpc.com](http://www.jfmpc.com) Yoga, immunity and COVID-19: A scoping review
- 11) <https://doi.org/10.1101/2022.08.25.22279201> **Effect of Pranayama on Perceived Stress, Well Being and Quality of Life of Frontline Healthcare Professionals on Covid-19 Duty: A Quasi-Randomized Clinical Trial**

## ANNEXURE

### CONSENT FORM

I Mr./Ms. \_\_\_\_\_ am giving my consent for participating in the study of To study the effectiveness of yoga therapy on quality of life after long covid in health care workers after 6 Weeks conducted by Tejal Bhosale(Physiotherapy UG student) as a part of her curriculum under the supervision and guidance of Dr Sheetal Bamhane I have been informed that no part of my information shall be revealed anywhere else except for the study and adequate secrecy will be maintained throughout. I agree to cooperate fully and have no rejection in participating and hereby give the consent for doing so.

Name of the participant: \_\_\_\_\_

Address: \_\_\_\_\_

Name of the institution: \_\_\_\_\_

Signature:

Date: