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"Effect of sitting suryanamaskar on risk of falls in community dwelling elderly"

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ABSTRACT-

Background: Falls are one of the major causes of mortality and morbidity in older adults. Every year, an estimated 30–40% of patients over the age of 65 will fall at least once. It can be due to many reasons.Exercise can reduce the risk of falls by up to 35% and also offers many other health benefits. Balance is one of the major problems in the elderly and are considered one of the "Geriatric Giants".Yoga aims to enhance the physical, mental and spiritual aspects of health and involves practicing a series of postures (asanas) and breathing exercises. Sitting Suryanamaskar is primarily been invented for elderly people or people with mobility issues or disabilities and who cannot do heavy exercises.

Method: Ethical clearance was taken from Institutional Ethical Committee,Pune.In this Experimental based study, 100 elderly between age group 65-75 years were selected according to convenient sampling method. Patients who have undergone any recent spine and lower limb surgeries. Patients having any neurological and musculoskeletal defect. Patients having cognitive dysfunction.Patients who are using assistive device.Patients having any recent cardiorespiratory problems. were excluded from the study. Static Balance was assessed using the Berg balance scale (BBS), Dynamic balance was assessed using Time up and go test (TUG), Risk of falls was assessed by using falls efficacy scale (FES).

Result: Wilcoxon test was used to find p-value for Berg balance scale (p-value <0.0005) and Time up and go test (p-value <0.0065) paired t test was used to find out p-value of Falls efficacy scale (p-value <0.0001) between 30 elderly.

Conclusion: Our study concluded that 6 weeks of sitting suryanamaskar had significant effect on reducing risk of falls in community dwelling elders.

Keywords: Static balance, Dynamic Balance, Risk of falls, Berg Balance scale, time up and go test, falls efficacy scale, Sitting Suryanamaskar.

INTRODUCTION-

Falls are one of the major causes of mortality and morbidity in older adults. Every year, an estimated 30–40% of patients over the age of 65 will fall at least once. Falls lead to moderate to severe injuries, fear of falling, loss of independence and death in a third of those patients. Falls are the top cause of accidents in people over the age of 65. Falls are also the main cause of serious injuries and accidental deaths in older people.[1]

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According to the population census in India 2011, the percentage of older adults above the age of 60 is 8.6% of the total population. The prevalence of falls in India above the age of 60 years reported to range 14%-53%. Older people who appear to be strong and well can fall. Falling is a real threat to your ability to live on your own. The normal changes of aging, like poor eyesight or poor hearing, can make falls more likely. Illnesses and physical conditions can affect strength and balance. Poor lighting or slippery surfaces make it more likely to trip or slip.[2]

Several approaches have been shown to reduce the risk of falls in older people including exercise, cataract surgery, medication reduction and home safety interventions however, none of these approaches have been evaluated in low-income settings. Exercise can reduce the risk of falls by up to 35% and also offers many other health benefits. Falls threaten the independence of older people and cause a cascade of individual and socioeconomic consequences. Many older people are reluctant to report a fall because they attribute falling to the aging process or because they fear being subsequently restricted in their activities.[3]

Balance is an important cause of morbidity and mortality in the elderly and are a marker of poor physical and cognitive status.Fear of falling can be associated with reductions in physical and social activities and negative impacts on quality of life. High levels of fear of falling can increase the risk of future falls, while low levels can be protective for falling, irrespective of the presence of balance impairments. Therefore, in addition to improving balance, it is important to understand how fear of falling can be reduced. [4]

In the modern world, the South Asian art of yoga has expanded to all corners of the globe.Yoga improves balance and mobility, and therefore has potential as a fall prevention strategy,Yoga aims to enhance the physical, mental and spiritual aspects of health and involves practicing a series of postures (asanas) and breathing exercises. Individuals who practice yoga are not free of health concerns, but most believe their health improved because of yoga. Yoga might be beneficial for a number of populations including elderly women and those with chronic health conditions. .[5]
Surya Namaskar, which is known as "Sun Salutation" is a part of yoga. It is a set of sequential yogic postures which are called as asanas. Yoga may be equally effective or better than exercise at improving a variety of health-related outcome measures like blood glucose, blood lipids and oxidative stress.[6]
Chair suryanamaskar is an easy way out for those who are on their chairs for long hours. Like, sitting for more than eight hours can lead to postural problems like disc damage, strained neck and swayed back in the long run. Many IT workers, corporate employees who work in sitting position for long hours complain of these postural problems. Sitting/Chair Suryanamaskar can minimise the risk.
Sitting Suryanamaskar is primarily been invented for elderly people or people with mobility issues or disabilities and who cannot do heavy exercises this is ideal for them as it will Improve overall blood circulation, improve concentration and is extremely helpful for the elderly, who can’t do the normal surya namaskar routine.

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MATERIALS AND METHODOLOGY

Methods: -

- Study Type: Experimental
- Sample Size: 30
- Sampling Method: Simple Random Method
- Study Duration: 6 Months.
- Study Set Up: Pune.
- Target Population: Community dwelling elderly in and around Pune.

Materials: -

- Data Collection sheet
- Consent form
- Chairs
- Stopwatch
- Footstool/ Step
- Pen
- Paper

Inclusion and Exclusion criteria

- **INCLUSION CRITERIA:**

1. Elderly between the age of 65-75 years.
2. Gender- Both male & female.
3. Individuals who are able to understand simple commands.
4. Subjects who are willing to participate in the study.

- **EXCLUSION CRITERIA:**

1. Patients who have undergone any recent spine and lower limb surgeries.
2. Patients having any neurological and musculoskeletal defect.
3. Patients having cognitive dysfunction.
4. Patients who are using assistive device.
5. Patients having any recent cardiorespiratory problems.

Outcome measures

- Berg balance scale (BBS)
- Falls efficacy scale (FES)
- Time up and go test (TUG)

OBJECTIVES-

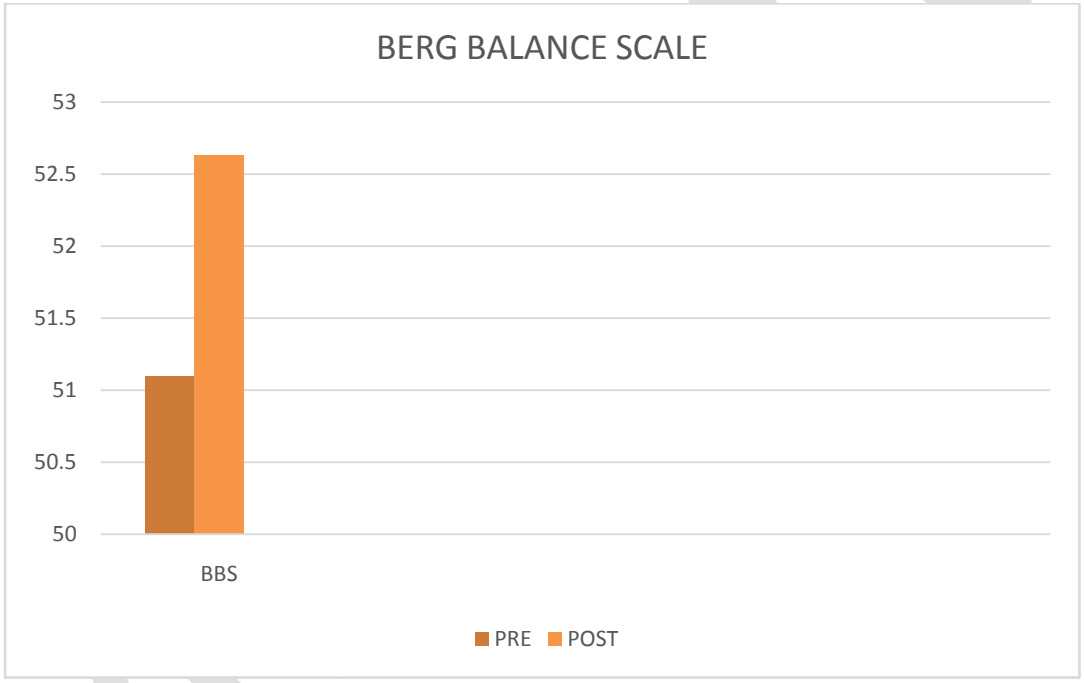
- To assess static balance in community dwelling elderly using Berg balance scale (BBS)
- To assess dynamic balance in community dwelling elderly using Time up and go test. (TUG)
- To assess risk of falls in elderly people using Falls Efficacy Scale (FES)

RESULTS-

Table no.1 Shows Mean and Standard deviation of Pre, Post and p-value of Berg Balance Scale (BBS)

BBS	MEAN ± SD	WILCOXON TEST *P*-VALUE
PRE	51.1 ± 2.551	<0.0005
POST	52.63 ± 2.593	

Graph no.1 shows Pre and Post values of Berg Balance scale

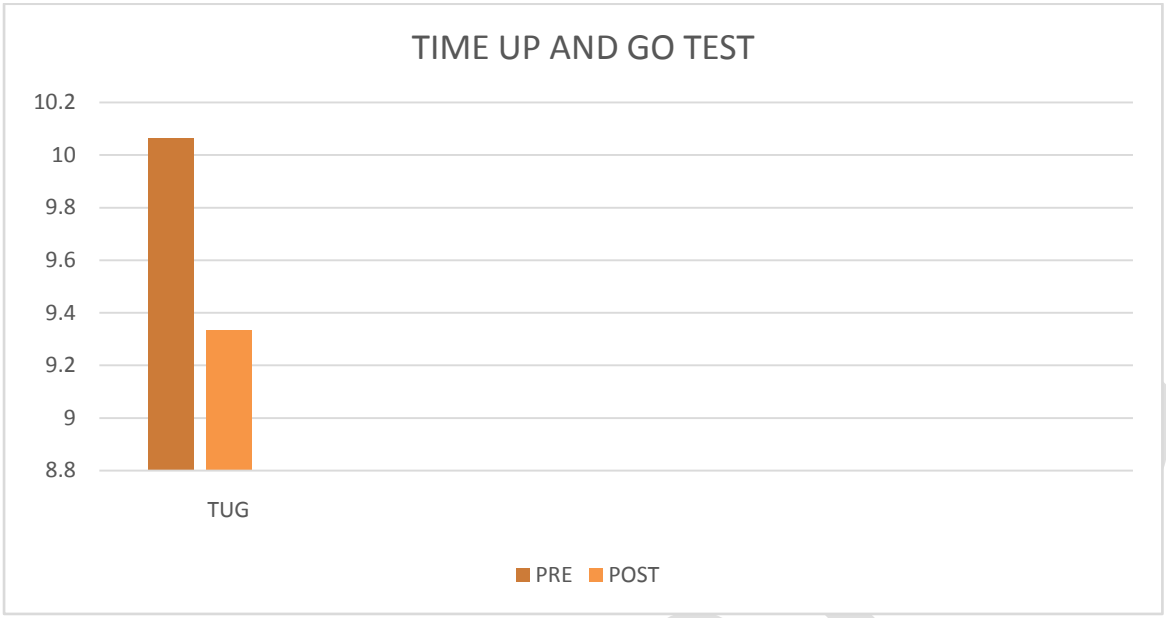


Interpretation: - Graph shows Pre and Post Values of Berg Balance Scale with a pre value score of 51.1 and post value score of 52.6 with a p- value of <0.0005 which is statistically significant

Table no. 2Shows mean and standard deviation of Pre, Post and p-value of Time up and go test (TUG)

TUG	MEAN ± SD	WILCOXON TEST *p*- VALUE
PRE	10.06 ± 1.507	<0.0065
POST	9.33 ± 1.124	

Graph no.2 shows Pre and Post values of Time up and Go test

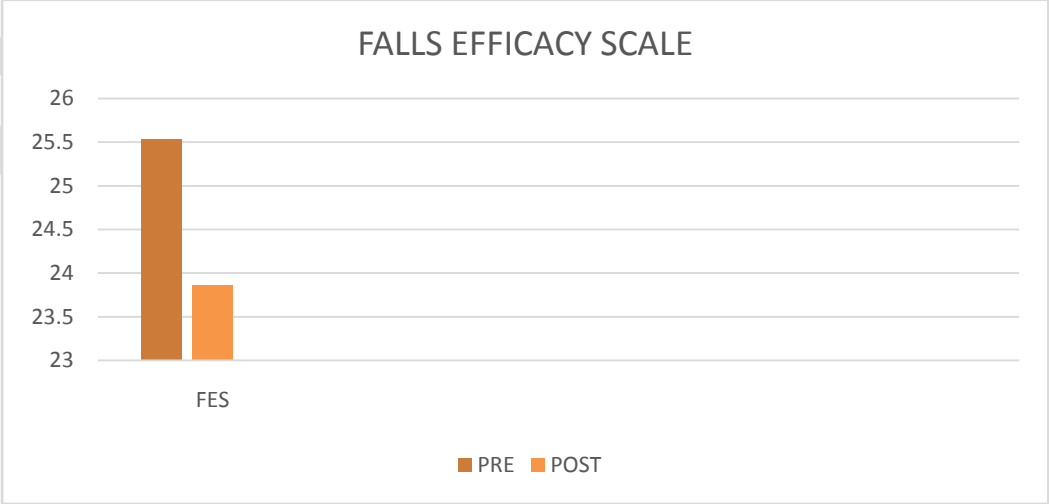


Interpretation: - Graph shows Pre and Post Values of time up and go test. For Pre value the time was 10.06 seconds and post value time was 9.3 seconds with a p- value <0.0065 which is statistically significant.

TABLE NO. 3 Shows mean and standard deviation of Pre, Post and p-value of Falls efficacy scale (FES)

FES	MEAN ± SD	*p*-VALUE
PRE	25.53 ± 5.532	<0.0001
POST	23.86 ± 5.463	

Graph no.3 shows Pre and Post values of Falls efficacy scale



Interpretation: - Graph shows Pre and Post Values of Falls efficacy scale. Pre value score is 25.5 and post Intervention score is 23.8 with (p- value <0.0001) which is extremely significant

DISCUSSION

The present study aimed to find out the effect of Sitting Suryanamaskar on risk of falls in community dwelling elders. 30 participants - both males and females were selected according to the inclusion and exclusion criteria. Outcome measures used were Berg balance scale (BBS), Time up and go test (TUG), Falls efficacy scale (FES). Berg balance scale assess static balance, Time up and go test assess Dynamic balance and risk of falls was been assessed by using Falls efficacy scale. Sitting suryanamaskar was given as an intervention for 6 weeks for 3 times per week with 11 repetitions andpre and post effect on risk of falls was seen.

In our study, in Table No.1, there were 53% of Males and 47% of Females who had actively participated. Jonathan Halpern et.al had studied Yoga for Improving Sleep Quality and Quality of Life for Older Adults in which there were 59 subjects out of which 81% of Females and 19% of Males had participated in their study. [14] Elderly people these days are very much aware of Physical fitness, Yoga, Suryanamaskar and benefits of it and as we had included a new form of suryanamaskar – Sitting suryanamaskar the subjects showed great interest in learning and practising this form of yoga.

Table No.2 depicts Age-group of Elders ranging from 65-75 years. Among which 13 participants were in the Age group of 65-69 years with mean age 67 and in age group 70-75years there were 17 participants with mean age 72.5. Considering the geriatric population, they are classified into three groups: Young- old ages 65-74 years, middle- old ages from 75-84 years and oldest- old age group is ≥85 years. In our study we included young- old group of elderly people i.e., from 65-75 years, because as they start experiencing falls, balance gets impaired, Degenerative process starts in this age and complications and sequel of chronic long-term disease such as hypertension and diabetes make their appearance. They are less dependent and frail during this time. Young old group of elderly people (65-74years) are more mobile and physically active than middle- old group of elderly. (75-84years)

As seen in table No.3,Berg balance scale (BBS) was one of the important outcome measure used to assess static balance. Pre value score of BBS was 51.1 and post value score was 52.6 with a p-value of <0.0005. Berg balance scale is a 14-item list with each item consisting of a five-point ordinal scale ranging from 0 to 4, with 0 indicating the lowest level of function and 4 the highest level of function. The items include simple mobility tasks example, transfers, standing unsupported, sit-to-stand and more difficult tasks example, tandem standing, turning 360°, single-leg stance. Linda D Bogle Thorbahnet, et al studied on the Use of the Berg Balance Test to Predict Falls in Elderly Persons, her outcome measure was BBS. The study proved that; Older adults who scored higher than the cut-off score on the test were less likely to fall than were those adults who

scored below the cut-off score. Decreased scores, however, did not predict increased frequency of falls. [15] This coincides with our study results that there was improvement and effect seen in the pre and post values of Berg balance scale. In our subjects, there was improved postural stability, balance and proprioception- as sitting suryanamaskar plays an important role in muscle strengthening and improving muscle mass and proprioceptors are primarily located in the muscles, tendons, joints and skin.

Table No.4 shows about Time up and go test (TUG). It was another outcome measure that we used to assess dynamic balance in our study. We found that the Pre value time was 10.06 seconds and post value time was 9.3 seconds indicated by *p*-value (<0.0065). Time up and go test is a simple test used to assess a person's mobility and requires both static and dynamic balance. It uses the time that a person takes to rise from a chair, walk three meters, turn around 180 degrees, walk back to the chair, and sit down while turning 180 degrees. Healthy adults are able to complete the test in less than 10 seconds. Scores of 11-20 seconds are considered within typical for frail elderly and scores over 30 seconds are indicative of impaired functional mobility and high risk of fall.Tiago S Alexandre et.al studied on Accuracy of Timed Up and Go Test for screening risk of falls among community-dwelling elderly he concluded that Time up and go test proved to be an accurate measure for screening the risk of falls among elderly individuals. Although different from that reported in the international literature, the 12.47 second cut-off point seems to be a better predictive value for Brazilian elderly individuals. [16]In our study,the elderly people were very punctual in performing sitting suryanamaskar every 3 times for 6 weeks. It gave benefits like it improved muscle strength, improved their physical activity and mobility. It eventually gave them confidence to perform their daily activities without the fear of losing balance. Therefore, we had effect in the pre and post scores of the time up and go test.

In Table No.5,Falls efficacy scale (FES) was used to assess Risk of falls in the community dwelling elderly. In our study, Pre value score was 25.5 and post Intervention score was 23.8 with (p- value <0.0001) which is extremely significant. Falls Efficacy Scale (FES) is a scaleto measure fear of falling. It is a 10-item list which includes activities of daily living like- take a bath or shower, walk around the house, personal grooming. Minimum score being 1 which indicates the individual is very confident and Maximum being 10 which indicates the individual is not confident at all. A total score of greater than 70 indicates that the person has a fear of falling. A study conducted by Mary E Tinetti et.al on Falls Efficacy as a Measure of Fear of Falling they found that the Falls Efficacy scale(FES) appears to be a reliable and valid method for measuring fear of falling. This Scale may be useful in assessing the independent contribution of fear of falling to

functional decline among elderly people. [17]Over 6 weeks of sitting suryanamaskar, there was good effect seen in the participants it worked well and enhanced their muscle strength, flexibility, improved physical activity and their balance. Confidence was boosted in elderly as they were motivated to perform it on daily basis. Their fear of falling eventually reduced in a few weeks. So, we had improved post intervention scores of FES than Pre FES scores.

Many people have been practicing yoga since several years now, both young and elderly population. Yoga is remarkably effective workout for seniors as it prevents secondary complications, - Osteoporosis, breathing issues, impaired balance and weakness. It helps in weight reduction, anxiety, stress, hypertension, improves blood circulation and muscle strength, protects joints and enhances better sleeping habits. Lisa Keay et.al (2018) conducted a study on mixed methods evaluation of yoga as a fall prevention strategy for older people in India. The Study identified some important preliminary indicators of the viability of yoga as fall prevention strategy for older people in India. The findings lend confidence to this approach and provide guidance for future more comprehensive evaluations, including randomised controlled trials. [7]. Sitting suryanamaskar is a new form of Yoga especially for the older adults who cannot really perform standing suryanamaskar routine. Sitting suryanamaskar does have many benefits like – improving overall blood circulation and refresh lethargic mood, helps in reducing fat deposits around the abdomen, strengthens arms, legs, back and core muscles, improves physical activity and mobility, helps in building confidence and fight fear of falling. Sitting suryanamaskar helps in retaining muscle strength, ensures core strength, enhances fitness and flexibility. Elderly people have fear of falling and high risk of falls due to many reasons- Impaired balance and co-ordination, reduced physical activity, poor muscle power and so on., and as elderly people have problems like arthritis, back pain, vertigo and other limitations it's not possible for them to perform standing suryanamaskar aasans. In our study, sitting suryanamaskar helped them gain confidence, improved musculoskeletal issues and physical activity over a period of six weeks.

CONCLUSION

Our study concluded that 6 weeks of sitting suryanamaskar had significant effect on reducing risk of falls in community dwelling elders.

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