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**A COMPARATIVE STUDY TO ASSESS THE EFFECTIVENESS OF  
PHYSICAL EXERCISES VERSUS PRANAYAMA ON DEPRESSION  
AMONG ELDERLY'S RESIDING IN OLD AGE HOMES AT THE  
CENTRAL PART OF GUJARAT**

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**ABSTRACT**

**Aim:** To assess the effectiveness of physical exercises versus pranayama on depression among elderly's residing in old age homes.

**Method:** In this comparative study 50 elderly patients were selected using consecutive sampling technique. The elderly were divided into two groups physical exercise (N=25) and pranayama group (N=25) the depression level was measured using Geriatric depression scale.

**Result:** The pre-depression level of elderly in the physical exercise group was 12.28 and in the pranayama group was 12.08 after the intervention the depression score in the physical exercise group was 7.96 and in the pranayama group was 7.48.

**Conclusion:** Physical exercise and pranayama are equally effective in reducing the depression among the elderly.

**Keywords:** Depression, physical exercises, pranayama, old age home, elderly

**INTRODUCTION**

Human beings age in every aspect, the physical body changes as organs become less functional, psychological changes leads to memory impairments and cognitive decline,

social status changes with retirement and loss of job. About two-thirds mortalities in the population happens due to age-related changes. There are arrays of disorders that

emerges with aging like cancer, dementia, delirium, diabetes, heart disorders and other significant mental disorders [1].

Advancing technology is leading to longevity among older adults, which is putting them at greater risk of developing mental diseases, depression being one of them [2]. The elderly in India are suffering from depression on a higher scale than in the rest of the countries, with limited community-based research being carried out [3]. With an elder adult incidence of 5.7 %, depression is thought to be prevalent globally at a rate of 3.8 %. The annual suicide rate across the globe is seven lakhs. A prolonged lowmood known as depression is characterized by a loss of interest in or pleasure from previously enjoyed activities [4]. Depression is common among elderly in India; especially who are single, alone after death of their partner, uneducated with weak financial background [5]. Older widow who are the victim of abuse are at risk of depression more frequently than older males [6]. A report by WHO states that the majority of the elderly population are not informed about the advantages of engaging themselves in some or the other form of physical activity, which puts them at risk of various long-term physical and mental illnesses [7].

A meta-analysis revealed that yoga helps in minimizing the detrimental effective of depression among older adults regardless of

comorbid conditions [8]. Pranayama and yoga showed significant improvement on the stress level among older adults. [9].

People who are involved in high intensity physical activity report good on the mental wellbeing scale, as reported by a study; considerable amount of workout lowers the likelihood of cognitive impairment among the elderly [10]. Alternative therapies like pranayama combined with other natural interventions is successful for managing depression in older adults minimizing complications caused by drugs [11]. As indicated by various studies that any form of pranayama and physical activity is effective in reducing the stress and depression level among the elderly; the present study aimed to compare their effectiveness.

## METHODS AND MATERIAL

### Study Design:

Quasi-experimental design

Pranayama group=25

Experimental group=25

### Study Site:

The study was conducted at Pij Jalaram old age home and Jalaram Vishram Grah Karamsad, Anand Gujarat.

### Sample Size:

Total 50 elderly were included in the study.

$$n = z^2 * p * (1 - p) / e^2$$

$$z = 1.96, p = 0.0323, e = 0.05$$

$$n = 1.962 * 0.0323 * (1 - 0.0323) / 0.052$$

$$n = 0.1201/0.0025 = 48.03$$

$$n = 49 \quad \text{Sample size is 49}$$

**Where:  $z = 1.96$  for a confidence level of 95%,  $p$  = proportion (expressed as a decimal),  $e$  = margin of error.**

**Inclusion and Exclusion Criteria:**

Geriatric Depression Scale was used to assess the level of depression, those suffering from mild to moderate level of depression was included. Elderly in the age group 60- 80, male and female both were included. Those elderly suffering from chronic illness, severe depression are physical unfit or were practising any form of yogic breathing technique were excluded.

**Study Tool:**

Geriatric depression scale a self-reported screening tool developed by J.A. Yesavage in 1982 and physical activity readiness questionnaire (PAR-Q) is a screening tool for physical fitness were used in the study.

Geriatric depression scale specifically designed to screen depression among the elderly has total 30 items. A range of 0-9 is considered as normal, 10-19 is mildly depressed and 20-30 as severely depressed. The tool is easy to comprehend and takes less than 10 minutes to complete, making it ideal for the older adults who can easily get fatigued. The items on the tool were positive and negative and the scoring was done based on the formulation of the statement. If the samples gave an answer which indicated depression the score was given as 1 and if the statement was neutral, it was scored as 0 [12].

The physical exercise screening tool consists of seven "yes" or "no" questions. A "no" response from the participants indicated that they were fit to participate in the study, and "yes" on the scale indicated having some medical ailments [13].

**Training Tools:**

The elderly were provided pranayama like nadi shodhana (anulom vilom), kapalabhati, bhastrika, surya bheda and physical exercises like neck rotation, scapular rotation, seated marching, shoulder stretch, walking, side walking (both sides), ankle rotation with knee extension, hamstring stretch, raising arms, cross leg stretching. Both the intervention were given for 30 minutes on alternate days for a duration of one month.

**Research Ethics:**

The study was approved by Institutional ethics committee CHARUSAT, Changa, Gujarat. Administrative approval was obtained from the management of the old age homes. Informed consent was obtained from the participants. The participants were explained about intent of the data collection and the confidentiality of the data was assured.

**Preparation and Investigation Phase:**

The researcher selected the two old age homes by convenience. The samples were taken from Pij Jalaram old age home and Jalaram Vishram Grah Karamsad, Anand, Gujarat. The samples were described

according to their demographic characteristic; age, gender, education, occupation, nutritional status, marital status, number of children and source of financial support. The level of depression was assessed using Geriatric depression scale, those elderly who were in mild to moderate range of depression and those fulfilling the inclusion criteria were included in the study. The residents from Pij Jalaram old age home were offered pranayama and those residing in Jalaram Vishram Grah Karamsad were given physical exercise as intervention. The interventions were carried out for one month on alternate days for 30 minutes. After a duration of one month the level of depression was measured by Geriatric depression scale in the physical exercise group and pranayama group. The results of both the groups were analysed using inferential and descriptive statistics.

#### **Statistical Analysis:**

The demographic characteristics will be represented by frequency and percentage. The effectiveness of each intervention will be tested using paired t-test. The comparison between pranayama and physical exercises in terms of effectiveness will be done using paired t-test.

#### **RESULTS**

The study comprised of 50 elderly residing in Pij Jalaram old age home and Jalaram Vishram Grah Karamsad, Anand, Gujarat, falling in the range of mild to moderate depression. One group (N=25) were offered physical exercises and other group (N=25) were given pranayama. The highest percentage of samples 56% were of 60–70 years in the physical exercise, whereas the majority of samples 56% were in 70-80 years range in the pranayama group. Majority were females in both the group; physical exercise 64% and pranayama 60%. Most of the elderly were of high school education in both the groups, 76% in physical exercise group; 60% in pranayama group only 8% were illiterate in both the groups. Majority were retired 72% in the physical exercise group and 68% in pranayama group. The nutritional status was optimal in both the groups, few elderly were underweight 16% in physical exercise and 20% in pranayama group. All the samples were either married or separated in both the group only 4% was single in physical exercise group. Childless were only 8% in both the groups. Majority of elderly in the physical exercise group received financial help from relatives 48% and children 48%, whereas pranayama 76% support came from relatives (**Table 1**).

**Table 1: Frequency and percentage of demographical variables of both physical exercise and pranayama group**

Sr. No	Variables/Categories	Physical exercise n=25		Pranayama n=25	
		Frequency	Percent%	Frequency	Percent [%]
1.	<b>Age</b>				
	60 - 70 years	14	56%	11	44%
	70 - 80 years	11	44%	14	56%
2.	<b>Gender</b>				
	Male	9	36%	10	40%
	Female	16	64%	15	60%
3.	<b>Education</b>				
	Illiterate	2	8%	2	8%
	High school	19	76%	15	60%
	Higher Secondary	4	16%	8	32%
4.	<b>Occupation</b>				
	Service	7	28%	8	32%
	Retired	18	72%	17	68%
5.	<b>Nutritional Status</b>				
	Normal	18	72%	17	68%
	Obesity	3	12%	3	12%
	Underweight	4	16%	5	20%
6.	<b>Marital Status</b>				
	Married	14	56%	14	56%
	Single	1	4%	0	0%
	Separated	6	24%	5	20%
	Widowed	4	16%	6	24%
7.	<b>Number of Children</b>				
	None	2	8%	2	8%
	One	9	36%	9	36%
	Two	9	36%	11	44%
	> Two	5	20%	3	12%
8.	<b>Financial Support</b>				
	Son / Daughter	12	48%	6	24%
	Husband / Wife	1	4%	0	0%
	Relatives	12	48%	19	76%

**Table 2: Depression score, SD, mean difference and ‘t’ value to assess the effectiveness of physical exercise.**

GROUP	MEAN		MEAN DIFFERENCE	STANDARD DEVIATION OF DIFFERENCE	t VALUE
	Pre-test	Post-test			
Physical exercise group	12.28	7.96	4.320	2.212	9.765

t= 9.765 at 0.05 level with df= 24

**Table 3: Depression score, SD, mean difference and ‘t’ value to assess the effectiveness of pranayama.**

GROUP	MEAN		MEAN DIFFERENCE	STANDARD DEVIATION OF DIFFERENCE	t VALUE
	Pre-test	Post-test			
Pranayama group	12.08	7.48	4.600	1.979	11.622

t= 11.622 at 0.05 level with df= 24

**Table 4: Post-depression level score, SD, mean difference and ‘t’ value to compare the effectiveness of physical exercise v/s pranayama**

TREATMENT	POST-DEPRESSION LEVEL SCORE		MEAN DIFFERENCE	t VALUE	TABLE VALUE
	Mean	SD			
Physical exercise	7.96	1.29	0.48	1.41	2.02
Pranayama	7.48	1.59			

t= 2.02 at 0.05 level with df= 48

**Table 2** shows the post-test score of 7.96 which was less than the pre-test score of 12.28, with mean difference of 4.32 and SD of 2.2. The calculated 't' value of 9.76 is significantly higher than the table value of 2.06 at 0.05 level of significance. It revealed the statistical significance of physical exercise being effective in reducing the level of depression among older adults.

**Table 3** depicts the post test score of 7.48 is less than the pre-test score of 12.08 with the mean difference of 4.6 and SD of 1.97. The calculated 't' value of 11.62 is higher than the table value of 2.06 which indicated that pranayama is effectual in lowering the depression level among the elderly.

**Table 4** illustrates the comparison of the post test scores of physical exercise and pranayama. The post test score of physical exercise was 7.96 and the post test score of pranayama was 7.48 with the mean difference of 0.48. Statistically it revealed that both the intervention were equally effective in reducing the level of depression among the participants.

## DISCUSSION

The study intended to assess the effectiveness of physical exercise versus pranayama on reducing the level of depression among the elderly. The research study enrolled 50 elderly from two old age homes; one group was offered physical exercise and the other was given pranayama for a duration of one month; alternate days;

30 minutes. The highest percentage of samples 14, (56%) were in the age group of 60-70 years in the physical exercise group, whereas the majority of samples 14, (56%) were in 70-80-year age range for the pranayama group. Majority of elderly people were of the female gender in both groups, physical exercise group 16 (64%); pranayama group 15 (60%). The majority of samples were of high school education, 19 (76%) in the physical exercise group and 15 (60%) in the pranayama group. In terms of occupation, the majority of samples in the physical exercise group were retired, 18 (72%), and similarly in the pranayama group, 17 (68%). Regarding the number of children in both the groups, the majority of them had 2 or more than 2 children in physical exercise 5 (20%), and 3 (12 %) in pranayama. Majority of the financial support was provided by relatives in both groups, 16 (64%) in the physical exercise group and 15 (60%) in the pranayama group. A quasi experimental study done on elderly revealed the similar demographic characteristic 34% of older adults were in the age group 66-70 years, females were in majority 62%. However, with reference to number of children; 48% did not have any offspring. Majority samples 62% were uneducated [14]. A cohort study findings were also consistent in relation to demographic variables like age and gender, the majority of the participants were in the

age; 73.5, female gender were majority with 55.5 % [15]. Physical exercise and pranayama are effective in reducing the level of depression among the elderly. A study combined yoga with pranayama revealed it to be effective in reducing depressive symptoms among elderly [14]. Consistent result were reported by a study were yoga proved to be effective in improving the emotional health of the elderly, the result were positive in uplifting the overall mental well-being [16]. A randomized controlled trail study compared the effectiveness of antidepressant versus physical exercise on patients over 65 years of age, found physical exercise to be more effective than drugs [17]. Physical exercise and pranayama both proved to be equally effective. A randomized controlled study incorporated various asanas and physical exercise as intervention showed that yoga is more effective than physical exercise in reducing depression [18]. A study carried out for 2 months incorporating a yoga, exercise and control group, revealed that yoga is more effective [19].

## CONCLUSION

The study aimed to compare the effectiveness of physical exercise versus pranayama among older adults. It showed that both the intervention are effective in lowering the level of depression among the older adults. Comparison of both the intervention proved them to be equally

effective. Nevertheless any form of activity is beneficial for adults over 60 years of age, as it keeps them active and mentally strong. Depression can affect and alter an older adult's life to a significant level. It makes them to withdraw from all the fun-filled hobbies and interest, even the activities of daily living. They experience profound feeling of emptiness, insomnia, anorexia, loss of energy and feeling of fatigue most of the times. The inability to express or distinguish these changes delay the diagnosis and prognosis for the older adults, without any assistance to understand and overcome these symptoms sometimes makes an older adults more vulnerable to commit suicide [20]. With lack of involvement in regular physical activity an older adult is at risk of developing various physical disorders like muscular dystrophy, heart problems, muscle wasting, fluctuating blood pressure, falls and reduced morbidity. Decline of physical activity also raises a concern on their mental health making them more susceptible to anxiety, depression and mood liabilities [21, 22].

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