Evaluate the Effectiveness of Calisthenics on self-esteem among Elderly Residing in Selected Old Age Homes of Haryana, India

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Abstract

The aim of the study was to evaluate the effectiveness of Calisthenics on self-esteem among elderly. Quantitative research approach, quasi experimental nonequivalent control group pretest posttest design was used to collect the data from 70 elderlies (35 in experimental group and 35 in comparison group) by using convenience sampling technique. The tools used were Sample characteristics performa and Rosenberg's Self Esteem Scale. For both the groups pre-test, post-test-1and2 were taken on day 1st, 30th and 45th respectively. Calisthenics was given to experimental group thrice a week for four weeks. A significant difference was found in terms of self-esteem between the experimental and comparison group after intervention (t= 17.47 and p=0.001) at 0.05 level of significance. Hence, Calisthenics was found effective in increasing self-esteem among elderly.

Key words: *Self-esteem, Calisthenics, Elderly.*

Introduction

Ageing is a continuous process beginning at the time of conception and ending with death. It is the process of becoming older, a process that is genetically determined and environmentally modified.[1]

Older people, often experience greater rates of loneliness and social isolation which occurs for many reasons, including death of social ties, relocation to different types of living and care communities, and limitations in physical and mental health. This can lead to poor quality of life, lower self-esteem and poor sleep quality, which may further lead to anxiety and depression among older people.[2]

Self-esteem is individual's attitude toward himself/herself which measures one's feelings of self-evaluation and self-acceptance, and reflects one's value, worth and respect built by perceived views across the significant surroundings.[3] There are several factors that influence the development of one's self esteem. Among them is the respect, acceptance, and attention received from significant people in one's life, including family members.[4]

One of the research study conducted with elderly members of a community in Montreal, Canada, found that there was decline in the self-esteem which may contribute to deregulate the hypothalamic-pituitary-adrenal axis functions that can cause adverse outcomes to the health of the elderly, such as social isolation.[5]

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The maintenance of high physical function is one of the key factors for successful aging.[6] Staying physically and mentally active can not only delay the development of some chronic illnesses and disabilities, but also improve mental and physical health in older adults as it helps in reducing depressive symptoms and promotes self-efficacy.[7]

There is no particular age to perform exercises; even in the old age, exercises can be performed. Many studies proved that exercises diminish the age related problems. Among all exercises calisthenics are simple exercises that can be easily performed by elderly group. Calisthenics is a type of arranged exercises made up of many different movements performed using simple steps. This exercise is an ideal way to increase flexibility by strengthening the muscle tone. Calisthenics is a widely practiced form of exercise and is recognized as a fun and healthy way to keep fit.[8]

Materials and Method

The study was conducted during the period from March 2018 to May 2019 in the state of Haryana, India. A total of 70 elderlies those who were aged 60 years and above, willing to participate in the study, residing in selected old age homes, who are alert, oriented and comprehend to respond, able to understand and speak Hindi and who are able to move without walking aids / physical assistance were selected by using Convenience Sampling technique. The tools used for data collection are Sample Characteristics Performa and Rosenberg's Self Esteem Scale. Self-report (interview) technique was used to collect the data.

Description of Tool:

Sample Characteristics Performa: It consisted of 13 items i.e. age, gender, marital status, education, previous occupation, duration of stay in old age home, relatives visit, nature of the previous habitat, financial support, health problems, regular physical activity, sleep medicines and mode of admission in old age home.

Rosenberg's Self Esteem Scale: It is a standardized tool which measures in a 4 point Likert scale (0-3) consisting of 10 items related to self-esteem which has 5 positive items and 5 negative items where it can be categorized as (0-14) low self-esteem, (15-22) moderate self-esteem and (23-30) high self-esteem. The calculated Cronbach Alpha Internal consistency was 0.91. Prior permission from the tool developer and Hindi translation was done by the researcher herself after obtaining permission from the tool developer.

Procedure:

After obtaining formal administrative approval from concerned authority of old age homes, 70 elderlies (35 in experimental group and 35 in comparison group) were selected using convenience sampling technique. The subjects were informed regarding the purpose of the study. Written consent was taken from the subjects to assure the confidentiality of their response. Pre-test was conducted on day 1st with sample characteristic and Rosenberg's Self Esteem Scale among elderly in both the groups. The total intervention was given from day 2nd to day 29th (4weeks). On the 2nd day, Calisthenics was administered to the experimental group individually in order to make the elderly follow the correct steps (Arm rotation, Trunk twisting in chair, Ankle rotation, Leg kick in chair, Hip rotation, Side bends and Forward bends, Stepping and Walking). Then from the 3rd day onwards Calisthenics was given in groups among experimental group, thrice a week, morning 25-30 minutes on alternative days for four weeks. Post-test-1 and post-test-2 was conducted on 30th and 45th day with Rosenberg's Self Esteem Scale in both the groups.

Kolmogorov- Smirnov test was applied to check the normality of data distribution. Data was normally distributed; hence parametric tests were applied.

Findings

Homogeneity between the experimental and comparison group was checked by Chi – square test in terms of sample characteristics and found that there was no significant difference between the groups in terms of sample characteristics at 0.05 level of significance. Which infer that both the groups were homogenous and comparable.

Percentage distribution of experimental and comparison group in terms of level of self-esteem shows that more than half of the elderly were having low self-esteem in both the experimental (60%) and comparison (68.57%) group. Chi – square was applied to compare both the groups in terms of level of self-esteem and it was found to be statistically non-significant ($\chi^2 = 0.56$, $p= 0.45$) at 0.05 level of significance. Hence, it infers that both the groups were homogenous and comparable in terms of level of self-esteem at baseline.

After administration of Calisthenics, percentage distribution of elderly in terms of level of self-esteem results that in experimental group, most of subjects were having high self-esteem in post-test-1 (74.28%) and post-test-2 (68.57%) then the comparison group in both post-test-1 (68.57%) and post-test-2 (62.58%) as depicted in figure 1.

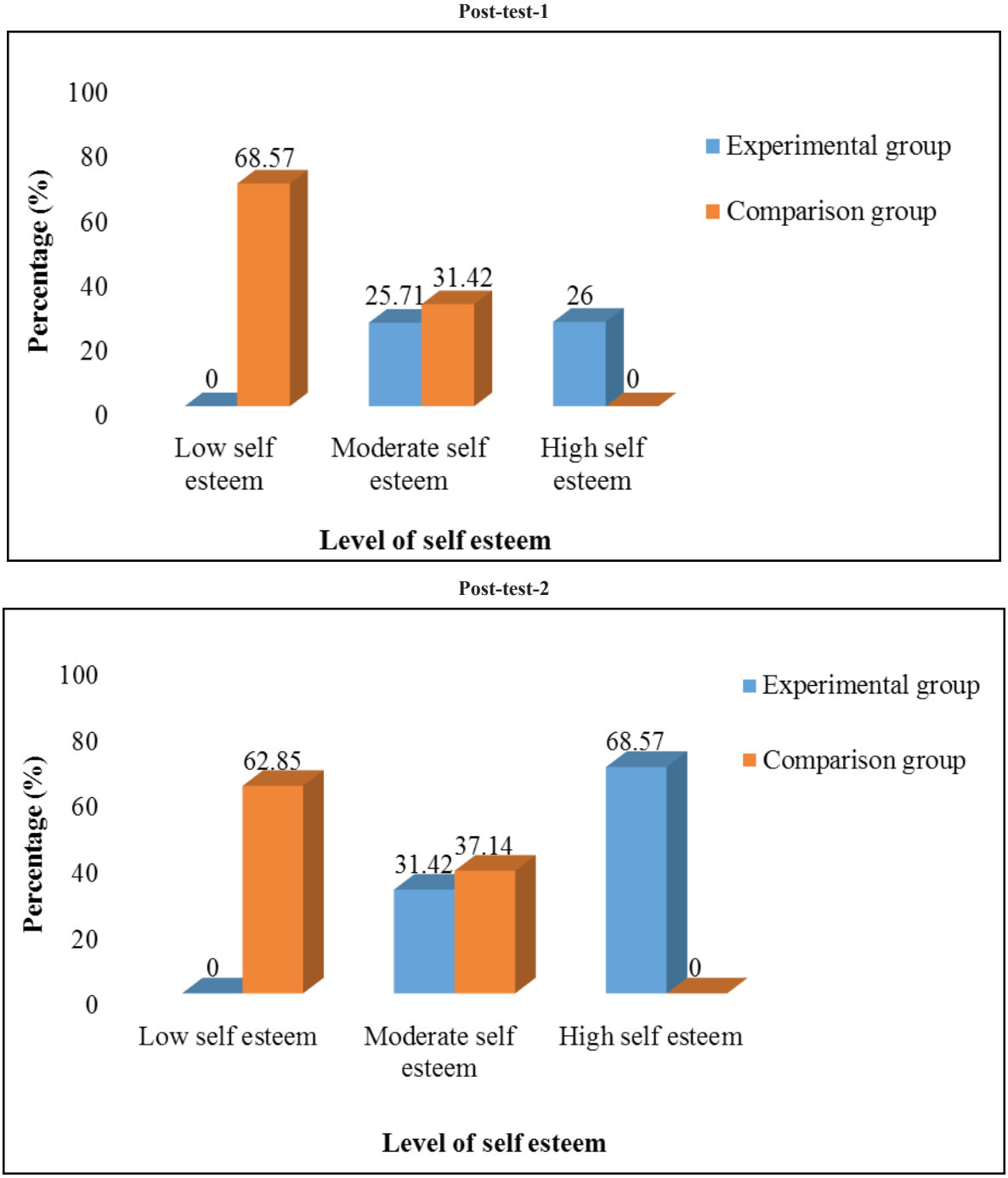

Figure 1: Bar diagram showing percentage distribution of elderly in terms of self-esteem in experimental and comparison

group after administration of Calisthenics.

Further, in both post-test-1 and post-test-2, experimental group had higher mean score then the comparison group in terms of self-esteem. The calculated 't' value for post-test-1 was 17.47 and p= 0.001 which was statistically significant at 0.01 level of significance. Similarly, in post-test-2, the calculated 't' value was 16.27 and p= 0.001 which was statistically significant at 0.01 level of significance as depicted in table 1. Hence, it infers that Calisthenics was effective in increasing the self-esteem among the experimental group.

Table 1: Mean, Mean Difference, Standard Deviation of Difference, Standard Error of Mean Difference and 't' value of Self Esteem among Elderly after administration of Calisthenics in Experimental and Comparison group

N=70

Observation	Group	Mean ± S.D.	M_D	SE_{MD}	't' value	df	p value
Post-test-1	Experimental group(n=35)	24.34±2.68	11.51	0.65	17.47	68	0.001**
	Comparison group(n=35)	12.83±2.82					
Post-test-2	Experimental group(n=35)	23.34±2.71	10.60	0.65	16.27	68	0.001**
	Comparison group(n=35)	12.74±2.73					

t(68)= 2.00 **- significant ($p < 0.01$)

The results of Repeated Measure ANOVA reveals that in experimental group, the mean score of self-esteem in pre-test, post-test-1 and post-test-2 was 13.77, 24.34 and 23.34 respectively. Where the F value is 300.60 with calculated p=0.001 which was statistically significant at 0.01 level of significance. Whereas in comparison group the mean score of self-esteem in pre-test, post-test-1 and post-test-2 scores was 12.89, 12.83 and 12.74 respectively. Where F value is 0.17 with calculated p= 0.84 which was statistically non-significant at 0.05 level of significance as depicted in table 2. Therefore, it can be stated that Calisthenics was effective in increasing the self-esteem among elderly.

Table 2: Repeated Measure ANOVA Showing the Mean Score from pre-test to post-test-2 in terms of Self Esteem in Experimental and Comparison group **N=70**

Groups	Test	Mean	F value	p value
Experimental group (n=35)	Pre-test	13.77	300.60	0.001**
	Post-test-1	24.34		
	Post-test-2	23.34		
Comparison group (n=35)	Pre-test	12.89	0.17	0.84^{NS}
	Post-test-1	12.83		
	Post-test-2	12.74		

^{NS} - Non significant($p \geq 0.05$) **- significant ($p < 0.01$)

Additionally, post hoc test (LSD) shows that post-test-1 and post-test-2 score was better than pre-test score and post-test-1 score was better than post-test-2 in terms of self-esteem in experimental group.

Association of pre-test self-esteem score with selected sample characteristics among elderly was tested by using one-way ANOVA and 't' test. The findings revealed that there was no significant association of self-esteem score with sample characteristics except in educational status i.e. (F= 2.82, p= 0.03) which was significantly associated with self-esteem among elderly.

Further, Post Hoc test was applied to reveal the mean difference of self-esteem in pre-test among elderly with selected sample characteristics (educational status) where it results that elderly who had primary education and secondary education were having higher self-esteem than those elderly who had higher secondary education and collegiate education.

Multiple regression analysis was used to explore the exact predictability of multiple independent variables on dependent variable. Based on basic assumption, step wise regression was applied. Data entered were raw/continuous variables, dichotomous variables and dichotomous dummy variables.

The stepwise regression results that Higher secondary education had prediction with variability of 7.90% (R^2 =0.079) as calculated F value=5.776 which was significant at 0.05 level of significance which further infers that changes of fluctuation or change in R value is less than 0.01. If Higher secondary education combines with duration of stay in old age less than 1 year, both variables together having prediction with variability of 14.50% (R^2= 0.145) as calculated F value = 5.586 which was significant at 0.01 level of significance which infers that changes of fluctuations or change in R value is less than 0.006 as depicted in table 3. Hence, Higher secondary education alone as well as Higher secondary education with duration of stay in old age less than 1 year mostly had equal amount of predictability with self-esteem.

Table 3: Step Wise Regression Showing Predictability on Self Esteem by Multiple Independent Variables among Elderly (Multiple Correlational Coefficient) in Pre-test N=70

Model	R Value	R square	F value	df	p value
Higher secondary education	0.282	0.079	5.776	1/67	0.01*
Higher secondary education, Less than 1 year duration	0.380	0.145	5.586	2/66	0.006*

*- significant ($p < 0.05$) **- significant ($p < 0.01$)

As there was predictability of Higher secondary education in multiple correlation coefficients, the direction of predictability for variable is, if chance of Higher secondary education increases by 1 point, the self-esteem increases by 2.5 points. Further when the Higher secondary education was combined with less than 1year duration stay in old age home, the direction of predictability for the variable is, if chance of Higher secondary education increases by 1 point, the self-esteem increases by 2.6 points and if chance of less than 1year duration increases by 1 point, the self-esteem gets decreases by 2 points. This infers that higher secondary education had continuous prediction in positive direction throughout the models which is shown in table 4.

Table 4: Step Wise Multiple Regression Showing Predictability of Self Esteem by Multiple Independent Variables among Elderly in (Regression Coefficient) in Pre test N=70

Model	Unstandardized coefficient		Standardized coefficients	t value	p value
	B	Std. error	Beta		
(Constant)	13.017	0.382		34.116	0.001**
Higher secondary education	2.539	1.056	0.282	2.403	0.01*
(Constant)	13.358	0.401		33.353	0.001**
Higher secondary education	2.653	1.027	0.294	2.583	0.01*
Less than 1 year duration	-2.051	0.913	-0.256	-2.247	0.02*

*- significant ($p < 0.05$) **- significant ($p < 0.01$)

Discussion

The present study population comprises with subjects who are age 60 years and above and among them, more than half of the subjects i.e. 57.1% were male and 42.9% of the study subjects were female in the experimental group. These findings were consistent to a study conducted by Deok-jo Kim, Sung-je Cho el al (2015) on Psychological State and Self-Esteem of Elderly in Relation to Socio-Demographic Characteristics where it was found that more than half of the study participants (53.8%) were male and the remaining 46.2% were female which is less than half of the subjects.[9]

In this present study it is found that 60% of elderly were having low self-esteem and 40% of elderly were having moderate self-esteem. The findings were consistent with the study conducted by Franak J, Malek M et al (2012) to assess the self-esteem among elderly in Kermanshah, Iran where they found one third of the elderly had a low self-esteem.[10]

Interestingly, the present study findings result a significant difference in the mean post-test self-esteem score among elderly between experimental and comparison group which infers that Calisthenics was effective in increasing the level of self-esteem among the elderly. These findings were consistent with the study conducted by Seong-Hi Park, Kuem Sun Han and Chang-Bum Kang et al (2014) on effects of exercise programs on quality of life and self-esteem in older people where it was found that exercise intervention was effective in increasing the level of self-esteem among older people.[7]

It has been previously argued that participation in the physical activity may have its greatest potential for enhancement of the levels of self-esteem. The present study findings certainly suggest the enhancement of the level of self-esteem among elderly after the administration of Calisthenics in the experimental group as there was a significant difference in terms of self-esteem from the pre-test score to post-test-1 and post-test-2 score. These findings were consistent with the study conducted by Edward McAuley, Jeffrey, Terry E, Shannon L el al (2001) on physical activity, self-esteem and self-efficacy relationship in older adults, where it was found that there was increased in the level of self-esteem upon completion of the intervention.[11]

Conclusion

Calisthenics was effective in increasing the self-esteem among elderly as there was a significant difference between the experimental and comparison group. There was a significant predictability for self-esteem by educational status and duration of stay in old age home.

Conflict of Interest: NIL

Source of Funding: NIL

Ethical Clearance: The ethical clearance was obtained from university research ethics committee of Maharishi Markandeshwar (Deemed to be University), Mullana, Ambala, India (MMU/IEC/1171) and the study was carried out in accordance with the guidelines laid by Indian Council of Medical Research (ICMR,2017). The permission was taken to conduct the study from concerned authority of old age homes of districts, Ambala (Jeevan Dhara Senior citizen home), Yamunanagar (Virdh Ashram park trust) and Kurukshetra (Baba Bansiwala Virdh Ashram) Haryana, India. Consent was prepared and filled from the study subjects regarding their willingness to participate in the research study. The purpose for carrying out research project was explained and assurance of confidentiality was given to the participants.

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