EFFECT OF HOME-BASED EXERCISE AND SELF-REGULATIVE TECHNIQUES ON FLEXIBILITY AND ANXIETY AMONG MIDDLE-AGED MEN

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Abstract:

The aim of the present study was to know the effects of home-based exercise and self-regulative techniques on flexibility and anxiety among middle-aged men. To attain the purpose of the study forty-five healthy middle-aged men accept to volunteer and their age between 45 and 50 years. They are teaching and non-teaching staff at Government Degree College, Sopore, Jammu and Kashmir UT. The subjects were randomly assigned into three equal groups, in which group - I (n=15) underwent home-based physical exercise, group - II (n=15) underwent self-regulative techniques and group – III (n=15) acted as a control. The relevant training program was given to the experimental groups for six days per week for twelve weeks. The control group did not perform any kind of structured physical activity. The criterion variables selected for the present study were: flexibility and anxiety. To measure the flexibility, the investigator used V-Sit and Reach test box and for testing the anxiety, the researcher used Hamilton Anxiety Rating (HAM-A) scale. The data was collected prior to and after experimentation from both the training groups and the control group. Paired't' test was applied to examine the change within the groups and find out the significant differences between the groups the Analysis of Covariance (ANCOVA) was applied. Whenever the 'F' ratio of the adjusted post-test mean was found to be significant, Scheffe's post hoc test was employed. The result of the present study indicates that there was a significant improvement in flexibility and a significant decrease in anxiety due to the effect of home-based physical exercise and self-regulative techniques when compared with a control group. There was a significant difference found between the training groups on flexibility and anxiety, in which the home-based exercise group has better performance than the self-regulative techniques group.

Keywords: *flexibility, anxiety, home-based exercise, middle-aged, improvement, and self regulative techniques.*

Introduction:

Physical risk factors for falls, such as balance and mobility impairments and reduced muscle strength, flexibility can be modified by exercise interventions and as such may reduce the incidence of falls in older people. Specifically, an individually home-based exercise program comprising strengthening and balance exercises and walking has been shown to improve balance and lower-body strength and prevent falls in middle-aged people **(Campbell *et al.*, 1997)**. It is estimated that the number of people aged 60 years and over throughout the world will increase from 606 million in 2000 to 1.9 billion by 2050. Thus, achieving a long life and maintaining a high level of physical activity and vital function is an important challenge for society. It has been demonstrated that regular exercise is effective for maintaining and promoting health, physical fitness, and functional independence in older adults, especially in terms of flexibility, endurance, muscular strength, and balance **(Yamauchi *et al.*, 2005)**.

Flexibility or limberness refers to the anatomical range of movement in a joint or series of joints, and length in muscles that cross the joints to induce a bending movement or motion. The ability to cope and be flexible was positively associated with improved psychological health. Flexibility reduced depression, anxiety, and stress. **(Kato, 2012)**. An in-depth experiment analyzed the relationship between difficulty identifying and describing feelings (DIDF) and psychological flexibility for men undergoing cancer screenings. Results showed that DIDF and psychological flexibility were reliable predictors of mental health. However, psychological flexibility only predicted mental health when DIDF was involved. Psychological flexibility allowed participants to have a better understanding of the subtleties of pleasant and unpleasant emotions. This understanding allowed participants to identify and describe their feelings better, thus enhancing their mental health. **(Landstra *et al.*, 2013).** Exercise is one of the important means for people to pursue health. Exercise can be done outdoors or indoors. During the pandemic, the home was the main place of activity. We hypothesize that home-based exercise enters people's lives. Studies have shown that regular physical activity is an important way to stay healthy during quarantine. Home-based exercise is a convenient and safe way to promote people's health and maintain their anxiety level during the pandemic. For one thing, it can keep people at a healthy level. On the other hand, it can effectively keep the corona virus away by avoiding close contact between people **(Pu *et al.*, 2020)**. How to promote people's home-based exercise is worth pondering. However, there are few studies on the influencing mechanisms of

home-based exercise during the pandemic. Health consciousness is the degree to which individuals care about their health the more health-conscious people are, the more likely they are to have healthy habits, which is the basis for individuals to take health measures **(Chen, and Lin, 2018).**

Self-regulation is defined as any effort an organism undertakes to alter its response **(Carver & Scheier, 2001)** and refers to a process in which individuals try to exert control over their thoughts, feelings, impulses, emotions, and performances. Self-regulatory strategies that foster exercises are goal setting, action planning, and action control **(Michie *et al.*, 2011).** Although "self-regulation" has become something of a buzzword in both personality and health research, it has not been spared attack. The core criticism is that by focusing on phenomenology, that is, common-sense and subjective experience, self-regulation models ignore and disconnect the actor from external reality **(Ogden, 1995).** This charge has taken two forms. That from the "politically incorrect" right asserts that the introduction of common sense leaves" Psychology stumbling down the road to hell" having sinned abandoning its proper focus on external causes **(Kimble, 1995).** The other, from the "politically correct" left, argues that focusing on what is in the person's head leads us to accept external reality as de facto fixed and to define therapy and adjustment as the transformation of the person's outlook rather than the transformation of the external world **(Sampson, 1981).**

Self-regulation or emotion regulation is a complex process that involves initiating, inhibiting, or modulating one's state or behavior in a given situation – for example, the subjective experience (feelings), cognitive responses (thoughts), emotion-related physiological responses (for example heart rate or hormonal activity), and emotion-related behavior (bodily actions or expressions). Emotion regulation is a highly significant function in human life **(Koole 2009).** Anxiety is an emotion characterized by an unpleasant state of inner turmoil, often accompanied by nervous behavior such as pacing back and forth, somatic complaints, and rumination. It includes subjectively unpleasant feelings of dread over anticipated events **(Davison (2008)**. Anxiety is a feeling of uneasiness and worry, usually generalized and unfocused as an overreaction to a situation that is only subjectively seen as menacing (**Bouras & Holt 2007).** It is often accompanied by muscular tension, restlessness, fatigue, inability to catch one's breath, tightness in the abdominal region, and problems in concentration. Anxiety is closely related

to fear, which is a response to a real or perceived immediate threat; anxiety involves the expectation of future threats including dread. (**American Psychiatric Association. (2013)**

Research Problem:

The purpose of this study was to investigate the effect of home-based exercise and self regulative techniques on flexibility and anxiety among middle-aged men. The main hypothesis was that regular exercises and meditation programs would enhance the body strength and self-efficacy level of the participants. The second hypothesis was that there will be a positive relationship between flexibility and anxiety among middle-aged people.

Methodology:

Participants

Forty-five healthy middle-aged men volunteered in the investigation and their ages between 45 and 50 years. The subjects were teaching and non-teaching staff at Government Degree College, Sopore, Jammu and Kashmir State. The subjects were randomly assigned into three equal groups, Group - I (n=15) underwent home-based physical exercise, group - II (n=15) underwent self-regulative techniques, and group – III (n=15) acts as a control group. The relevant training program was given to the experimental groups for six-day per week for twelve weeks. The control group did not perform any kind of structured physical activity apart from their regular day-to-day activities.

Selection of variables

Based on literary evidence, discussion with the experts, considering the very purpose of the study and the scholar's understanding the following variables and their test were selected for this study.

Table – 1
TEST ITEMS

Variables	Test	Unit of Measurements
Flexibility	V-Sit and Reach Test	Centimeters
Anxiety	Hamilton Anxiety Rating (HAM-A)	Points

Test tools

All the instruments used in this research are quite precise and reliable. For the flexibility test the investigator administered the V - Sit and Reach test box and for the administering of anxiety test the researcher used Hamilton Anxiety Rating (HAM-A).

Statistical techniques

The data was collected prior to and after experimentation from the home-based exercise group, self-regulative techniques group and control group. Paired't' test was applied to examine the change within the groups from pre-test to post-test on selected dependent variables. To find out the significant differences between the groups, the Analysis of Covariance (ANCOVA) was applied. When the 'F'- ratio of adjusted post-test mean was found to be significant, Scheffe's post-hoc test was employed. The level of confidence was fixed at 0.05 level of Significance.

Analysis of Data Interpretation:

The data collected from the two experimental groups and control groups during the pre and post-test period were statistically analyzed to examine the changes in selected flexibility and anxiety of middle-aged men and the result of the study is present in the tables.

Table - 2
PAIRED SAMPLE't'-TEST OF HOME-BASED EXERCISE SELF-REGULATIVE TECHNIQUES AND CONTROL GROUPS ON SELECTED DEPENDENT VARIABLES

Name of the Group	Name of the Dependent Variable	Pre-test mean	Post-test mean	't'
Home-based exercise Group	**Flexibility**	13.62	15.69	4.45*
	Anxiety	17.06	13.60	3.21*
Self-regulative techniques Group	**Flexibility**	13.87	14.76	2.73*
	Anxiety	16.93	14.06	2.33*
Control group	**Flexibility**	13.86	13.98	0.17
	Anxiety	17.26	17.06	0.15

** Significant at 0.05 level of confidence. Table value for level of significance df 14 was 1.753*.

The paired sample 't' was computed on the home-based exercise group, self-regulative technique group and control group factor was introduced in the above table. The 't' value for flexibility and anxiety for the home-based exercise group were 4.45 and 3.21 respectively. The paired sample 't' was computed on the self-regulative techniques factor were introduced in the above table. The 't' value for the flexibility and anxiety for the self-regulative technique group were 2.73 and 2.33 respectively. The 't' value for the flexibility and anxiety for the control group was 0.17, and 0.15, respectively. All the't' values are lesser than the required table value of df 14 at 0.05 level of confidence was 1.753. The result of the study shows that the control group did not alter significantly the performance of all the selected dependent variables.

Table – 3
ANALYSIS OF COVARIANCE ON FLEXIBILITY AND ANXIETY OF ADJUSTED POST-TEST SCORES OF EXPERIMENTAL AND CONTROL GROUPS

Variable Name	Group Name	Home-based exercise	Self-regulative techniques	Control group	'F'-ratio
Flexibility (in centimeters)	**Pre-test Mean ± S.D.**	13.62 ± 1.21	13.87 ± 0.92	13.86 ± 1.89	0.150
	Post-test Mean ± S.D.	15.69 ± 1.32	14.76 ± 0.85	13.98 ± 1.89	5.39*
	Adj. Post-test Mean	15.85	14.67	13.91	77.20*
Anxiety (in points)	**Pre-test Mean ± S.D.**	17.07 ± 2.96	16.93 ± 3.65	17.27 ± 3.63	0.036
	Post-test Mean ± S.D.	13.60 ± 2.94	14.07 ± 3.05	17.07 ± 3.45	5.31*
	Adj. Post-test Mean	13.62	14.20	16.90	123.38*

** Significant at .05 level of confidence. (The table value required for significance at .05 level of confidence with df 2 and 42 and 2 and 41 were 3.18 and 3.20 respectively).*

Results of the Study:

Table - 3 shows that the pre-test means 'F' ratio of home-based exercise, self-regulative techniques and control group on flexibility was 0.15 for pre-test scores is less than the required table value of 3.18 for significant at 0.05 level of confidence with df 2 and 42. The post- and adjusted post-test mean 'F' ratio on flexibility was 5.39 and 77.20 was greater than the required table value of 3.18 for significant. The above table shows that the pre-test means 'F' ratio of home-based exercise, self-regulative techniques and control group on anxiety was 0.036 which was less than the required table value of 3.18 significant at 0.05 level of confidence with df 2 and 42. The post- and adjusted test 'F' ratio of home-based exercise, self-regulative techniques and control group on anxiety are 5.31 and 123.38 which was significant at 0.05 level of confidence with df 2 and 42.

The result of the study indicates that there was a significant difference among the adjusted post-test mean values of home-based exercise, self-regulative techniques and control group on flexibility and anxiety. To determine the significant difference among the three paired means, the Scheffé *S* post-hoc test was applied as post-hoc-test and the results are presented in Table – 4

Table - 4
SCHEFFĚ *S* TEST FOR THE DIFFERENCE BETWEEN THE ADJUSTED POST-TEST MEAN OF FLEXIBILITY AND ANXIETY

Adjusted Post-test Mean					
Variable Name	**Home-based Exercise**	**Self-regulative Techniques**	**Control Group**	**Mean Difference**	**Confidence Interval at .05 level**
Flexibility	15.85	14.67	…	1.18*	0.39
	15.85	…	13.91	1.94*	0.39
	…	14.67	13.91	0.76*	0.39
Anxiety	13.62	14.20	…	0.58*	0.56
	13.62	…	16.90	3.28*	0.56
	…	14.20	16.90	2.70*	0.56

**Significant at .05 level of Confidence.*

Table - 4 shows that the adjusted post-test mean difference on flexibility between home-based exercise and self-regulative techniques and home-based exercise and control group and self-regulative techniques and control group were 1.18, 1.94 and 0.76 respectively, which are greater than the confidence interval of 0.39. Further the results of the study showed that home-based exercise and self-regulative techniques have significantly improved flexibility when compared to the control group. However, the improvement of flexibility was significantly higher for the home-based exercise group than for self-regulative techniques. It may be concluded that home-based exercise is better than self-regulative techniques in improving flexibility and self-regulative techniques are also a better tool to improve flexibility.

Table 4 shows that the adjusted post-test mean difference in anxiety between home-based exercise and self-regulative techniques, home-based exercise and control group and self-regulative techniques and control group were 0.58, 3.28 and 2.70 respectively, which are greater than the confidence interval of 0.56. Further the results of the study showed that home-based exercise and self-regulative techniques have significantly decreased anxiety. However, the decrease of anxiety was significantly higher for the home-based exercise group than the self-regulative techniques. It may be concluded from the results of the study that home-based exercises and self-regulative techniques are better in reducing anxiety.

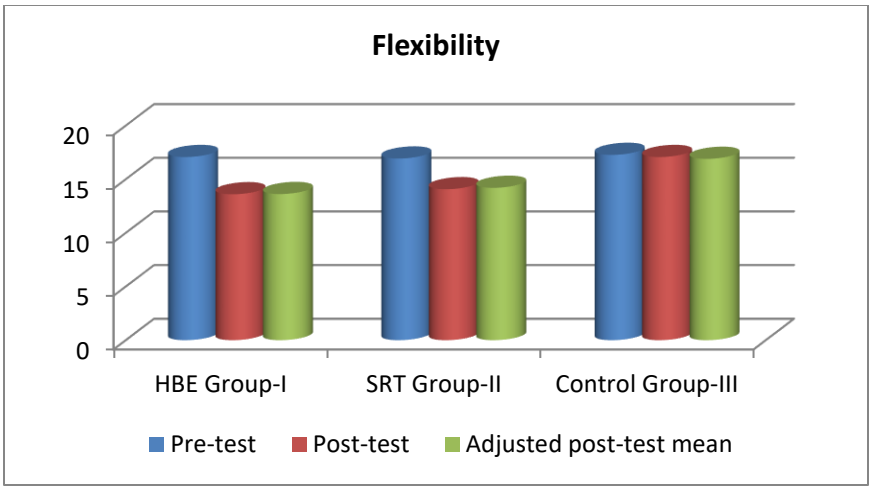

Figure - I: bar diagram showing the mean values of home-based exercise, self-regulative techniques and control groups on flexibility.

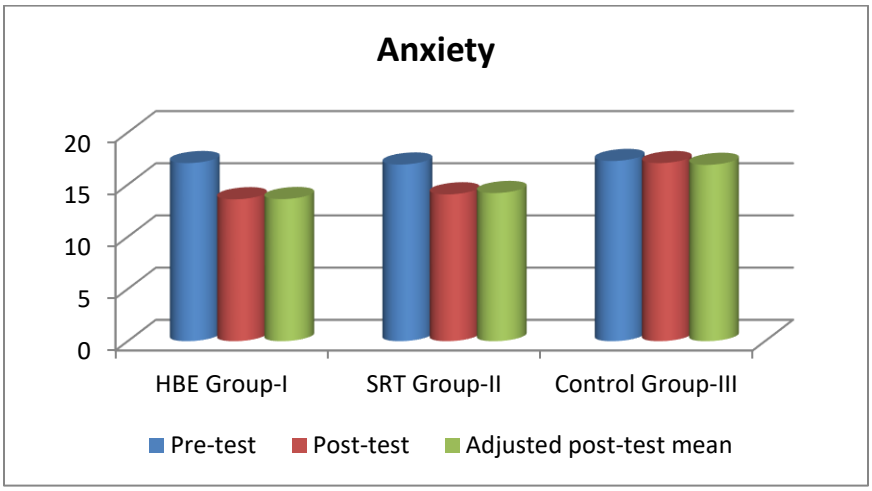

Figure - II: bar diagram showing the mean values of home-based exercise self-regulative techniques and control groups on anxiety.

Discussion on Findings:

The present study gives a clear picture that experimental groups showed better results and it was observed that there is a significant difference in flexibility and anxiety among sedentary middle-aged men. The result of this study indicates that home-based exercise is more efficient than self-regulative techniques to bring out desirable changes in flexibility and anxiety among middle-aged people. **Mathewos *et al.*, (2013)** found in their study, effects of aerobic exercise on improving health-related physical fitness components of Dilla university's sedentary female community revealed that aerobic exercise improved flexibility. **Arazi *et al.*, (2016)** revealed in their study on comparison of two aerobic training methods (running vs rope jumping) on health-

related physical fitness in 10 to 12 years old boys examined that aerobic training produced a significant improvement in flexibility. **Shahana *et al.*, (2010)** found in their study, that effect of aerobic exercise programme on health-related physical fitness components of middle-aged women showed that the flexibility improved over 12 weeks of aerobic training.

Gothe *et al.*, (2014) revealed in this study, after 8 weeks of yoga posture practice, the participants in the yoga group showed much better flexibility compared with their counterparts doing only regular stretching–strengthening exercise. **Armstrong *et al.*, (2003**) found in their study was initiated to ascertain whether participation in a 10-week, yoga-based, home exercise program would improve flexibility measures of older women.

Holschneider *et al.*, (2007) found in their study that the effect of exercise changes the brain circuitry and how the brain processes somatic sensations, thereby suggesting another mechanism by which exercise decreased anxiety and mood disturbances. **Vandana *et al.*, (2011)** Another study, utilizing an Integrated Amrita Meditation Technique involving meditation, pranayama, and yoga, found that practicing these techniques was effective in reducing adrenaline levels. **Iglesias *et al.*, (2012)** A study examining stress management, found that deep breathing, relaxation, meditation, and guided imagery techniques resulted in reduced levels of anxiety, anger, neuroticism, hopelessness, salivary cortisol, and respiration levels. **Roy *et al.*, (2020)** in a study on the Indian population reported high levels of anxiety in their respondents and suggested addressing the psychological issues of people and intensifying the awareness programs during this COVID-19 pandemic.

Conclusion:

It is concluded that the result of this study indicates the nature of the flexibility and anxiety significantly improved over 12 weeks of training period for home-based exercise and self-regulative techniques. Home-based exercise was found better than self-regulative techniques in enhanced physical and psychological parameters among middle-aged men and there was no significant change observed in the control group.

Recommendation:

The same study may be extended to find out new results over some time. Similarly, people of different ages can benefit from this study. The present study was confined to male-only; at the same time, this study is also helpful for females.

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