Impact of Resistance Exercise On Hand Grip: An Experimental study

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ABSTRACT
Sarcopenia is a significant medical issue related with aging, characterized as loss of bulk and capacity. It is a condition portrayed by loss of skeletal bulk and quality, with a danger of antagonistic results, for example, handicap, improvement of delicacy, low quality of life and death. Its etiology is still inadequately comprehended. Opposition preparing intercession is sheltered and compelling for checking sarcopenia. Resistance exercise (RE) programs improve muscle anabolism, bulk and muscle quality. The present study aims to assess the impact of resistance exercise on hand grip among the elderly population with sarcopenia. A quasi experimental research design with non-randomized control research design was conducted among 30 elderly population in Arrakonam among which 15 were chosen for the experimental group and 15 were chosen as the control group. A purposive sampling technique was used to select samples. Structured questionnaires were used to collect demographic data and BMI and hand grip was assessed. The resistance exercises were taught to the elderly population and they were asked to perform the exercise every day for one week. After a week, the BMI and hand grip was reassessed. The studies thus indicates that the experimental group had a reduction in the hand grip and increase in the BMI value after resistance exercise and is also an effective method to prevent further complications that can be caused due to sarcopenia.

INTRODUCTION

Old age has been characterized as a sequential age of 65 years of age or more established, while those from 65 through 74 years of age are alluded to as “early older” and those more than 75 old as late elderly. (Zdzieblik et al., 2015) Common meanings of ageing seldom separate the two cycles. For instance, maturing has been characterized as a 'reformist, summed up disability of capacity bringing about lost versatile reaction to push and in a developing danger old enough related disease’. (Beaudart et al., 2017)

The dynamic ageing idea, presently advanced by WHO, empowers the ‘cycle of becoming more seasoned without developing old through the upkeep of physical, social, and profound exercises all through a lifetime’. An ordered meaning of old or matured is regularly utilized, however challenged. The WHO utilizes classifications beginning at 65 years old and 80. (Youssef and Shanb, 2016)

Between the years 2000 and 2050, the overall extent of people more than 65 years old is relied upon to dramatically increase from the current 6.9% to16.4%. (Iannuzzi-Sucich et al., 2002) The extent
Sarcopenia is perceived as a significant medical issue among older adults. It is a condition portrayed by loss of skeletal bulk and quality, with a danger of antagonistic results, for example, handicap, improvement of delicacy, low quality of life and death. (Maruya et al., 2016) The term sarcopenia was first coined in 1989 by Irwin Rosenberg to depict this age-related reduction of bulk. Albeit essentially an infection of the old, its advancement might be related with conditions, for example, dementia and osteoporosis. (Killingback et al., 2017)

The prevalence of sarcopenia in India found in the current investigation (March 2020) was 14.2% in an old population (<60 years old) and was bound to happen more in ladies when contrasted with men (24.5% versus 3.4%). (Beaudart, 2017) The populace based examinations that announced the commonness of sarcopenia in healthy adults aged over 60 utilizing the European Working Group On Sarcopenia In Older People (EWGSOP), The International Working Group On Sarcopenia (IWGS), Asian Working Group For Sarcopenia (AWGS). The predominance is high in non — Asians than Asians. (White et al., 2009)

Resistance training intervention (lifting loads, extending groups or utilizing the people’s weight, or exercise executed on obstruction machines) is sheltered and successful for checking sarcope-nia. Resistance training intervention (RE) programs improve muscle anabolism, bulk and muscle quality. RE alone improved bulk in 2 of 4 examinations and muscle quality in 3 of 4 investigations contrasted and control exercises (low power home exercise or standard rehabilitation). (de Mello et al., 2019)

The investigator introduced and explained the intention of the investigation to the sample and obtained the written informed consent. The demographic data was collected using structured ques-
questionnaire for the elderly populations and the hand grip and the BMI value was also assessed. The level of hand grip and the BMI value was assessed before performing the resistance exercises amongst the elderly population. Then the resistance exercises were taught and were asked to be performed by the elderly population. After a week, the level of hand grip and the BMI value was re-assessed among the elderly population. The data were analyzed using descriptive and inferential statistics.

RESULTS AND DISCUSSION

Among 30 samples the experimental group, most of them 7(46.7%) were aged 60 above, 8(53.3%) were male, 9(60%) were educated, 12(80%) were married, 7(46.7%) were housewife and 10(66.7) were Hindus. The control group, most of them 8(53.3%) were aged 60 above, 10(66.7%) were female, 8(53.3%) were educated, 12(80%) were married, 10(66.7%) were housewife and 9(60) were Hindus.

The pretest of experimental group, most of them 11(73.33%) were normal and 4(26.67%) were weak whereas in the post-test, all of them 15(100%) were normal. The Table 1 also portrays that in the control group, most of them 10(66.67%) were weak and 5(33.33%) were normal both in the pretest and post-test.

The current examination was upheld by Iolascon et al. (2014) physical exercise and sarcopenia in older people. 2 preparing programs gave the advantages of improved versatility and equilibrium in old ladies “in danger of sarcopenia”; simultaneous preparing was more successful regarding the practical limit. The investigation thus demonstrated that there is improvement of portability and equilibrium in the older ladies who are high “hazard for sarcopenia.”

Another investigation was upheld by Yeung et al. (2020) directed the examination to survey the current information, practice, diagnosis, treatment among the Australian and New Zealand medical care experts. Results acquired by the investigation are all out of 250 experts partook; 84 finished the half year surveys. Previously, legitimately after and at a half year, individually, 14.7%, 93.4% and 59.5% distinguished sarcopenia as an infection: 2.0%, 79.6% and 38.1% effectively addressed the sex explicit shorts for low handgrip quality. Separately, 12.0% and 14.3% reported to make sarcopenia analyze as a component of their training previously and at a half year. Along these lines the specialists reasoned that knowledge about sarcopenia is restricted among medical care experts who went to an expert advancement occasion. Maintenance of information stays a test to be addressed.

The pretest of experimental group, most of them 11(73.33%) were normal and 4(26.67%) were overweight whereas in the post-test, 12(80%) were normal and 3(20%) were overweight. The control group, most of them 12(80%) were normal and 3(20%) were normal whereas in the post-test, most of them 13(86.67%) were normal and 2(13.33%) were normal.

The pretest mean score of grip strength in the experimental group was 26.19±1.65 and the post-test mean score was 29.66±1.20. The calculated paired ‘t’ test value of $t = 8.507$ was statistically significant at $p<0.001$ level. This indicates significant improvement in the level of grip strength in the post-test among the elderly with Sarcopenia in the experimental group which clearly infers that home-based exercise administered to the elderly with Sarcopenia in the experimental group had improved the post-test level of grip strength considerably. (Table 2)

The pretest mean score of grip strength in the control group was 23.69±3.04 and the post-test mean score was 23.71±3.07. The calculated paired ‘t’ test value of $t = 1.000$ was not found to be statistically significant. (Table 3 & Figure 1)

The calculated student independent ‘t’ test value of $t=6.989$ was found to be statistically significant at $p<0.001$ level. This indicates that there was significant improvement in the level of grip strength in the post-test among the elderly with Sarcopenia in the experimental group than the control group which clearly infers that home based exercise administered to the elderly with Sarcopenia in the experimental group had improved the post-test level of grip strength considerably. (Table 4)

The present is upheld by Wei et al. (2016) directed the examination on Whole-Body Vibration Training

![Figure 1: Percentage distribution of pretest and post-test level grip strength among elderly in the experimental and control group](image-url)
Table 1: Frequency and percentage distribution of pretest and post-test level grip strength among elderly in the experimental and control group N=30(15+15)

<table>
<thead>
<tr>
<th>Group</th>
<th>Grip Strength</th>
<th>Weak</th>
<th>Normal</th>
<th>Strong</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Experimental</td>
<td>Pretest</td>
<td>4</td>
<td>26.67</td>
<td>11</td>
</tr>
<tr>
<td>Group</td>
<td>Post Test</td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>Control Group</td>
<td>Pretest</td>
<td>10</td>
<td>66.67</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Post Test</td>
<td>10</td>
<td>66.67</td>
<td>5</td>
</tr>
</tbody>
</table>

Table 2: Frequency and percentage distribution of pretest and post-test level BMI among elderly in the experimental and control group N = 30(15+15)

<table>
<thead>
<tr>
<th>Group</th>
<th>BMI</th>
<th>Underweight</th>
<th>Normal</th>
<th>Over Weight</th>
<th>Obese</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>Experimental</td>
<td>Pretest</td>
<td>0</td>
<td>73.33</td>
<td>26.67</td>
<td>0</td>
</tr>
<tr>
<td>Group</td>
<td>Post Test</td>
<td>0</td>
<td>80.0</td>
<td>20.0</td>
<td>0</td>
</tr>
<tr>
<td>Control Group</td>
<td>Pretest</td>
<td>0</td>
<td>80.0</td>
<td>20.0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Post Test</td>
<td>0</td>
<td>86.67</td>
<td>13.33</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 3: Comparison of pretest and post-test level of grip strength among elderly with Sarcopenia in the experimental and control group N= 30(15+15)

<table>
<thead>
<tr>
<th>Group</th>
<th>Test</th>
<th>Mean</th>
<th>S.D</th>
<th>Paired ‘t’ test Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Pretest</td>
<td>26.19</td>
<td>1.65</td>
<td>t = 8.507 p = 0.0001</td>
</tr>
<tr>
<td>Group</td>
<td>Post Test</td>
<td>29.66</td>
<td>1.20</td>
<td>S***</td>
</tr>
<tr>
<td>Control Group</td>
<td>Pretest</td>
<td>23.69</td>
<td>3.04</td>
<td>t = 1.000 p = 0.334</td>
</tr>
<tr>
<td></td>
<td>Post Test</td>
<td>23.71</td>
<td>3.07</td>
<td>N.S</td>
</tr>
</tbody>
</table>

Table 4: Comparison of post-test level of grip strength among elderly with Sarcopenia between the experimental and control group N = 30(15+15)

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>S.D</th>
<th>Student Independent ‘t’ test value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>29.66</td>
<td>1.20</td>
<td>t = 6.989 p = 0.0001 S***</td>
</tr>
<tr>
<td>Control Group</td>
<td>23.71</td>
<td>3.07</td>
<td></td>
</tr>
</tbody>
</table>

***p<0.001, S –Significant

Improves Muscle and Physical Performance in Community Dwelling with Sarcopenia. The WBV bunch demonstrated critical inside gathering enhancements in isometric and isokinetic knee augmentation, TUG, 5 STS and 10 MWT (p<0.05), however not in CSA of VM. The WBV bunch had altogether preferable execution over the benchmark group in isokinetic knee augmentation at 180°/s, TUG, 5 STS at both mid-and post-mediation (p<0.05).

Another investigation is additionally upheld by Tsekoura et al. (2018) Effects of Group and Home-Based Exercise Programs in Elderly with Sarcopenia. Results were evaluated at the pattern, promptly post-mediation (week 12), and 3 months post-intercession (week 24). Huge gathering x time connections (p < 0.001) were observed grasp and knee muscle quality. Gathering based contrasted with locally established exercise yielded huge upgrades (p < 0.05) in bulk record, muscle quality at 12 weeks. Most enhancements at 24 weeks were accounted for with gathered exercise. No progressions were found over the benchmark group. Outcome propose bunch based exercise was more successful than locally situated for increasing the practical ability. The demographical factors had indicated measurably huge significant with the post-test level of hold quality among older with Sarcopenia in the exploratory gathering. Support in a mediation ought to do the resistense exercise to forestall huge decreases in lower extremity muscle mass, quality and versatility, even in the long haul.
and may be helpful in stalling in any case huge increases in fall rates.

CONCLUSIONS

Resistance training intervention is sheltered and successful for checking sarcopenia. Resistance training intervention (RE) programs improve muscle anabolism, bulk and muscle quality. This indicates the home based resistance exercises is significant in improving the muscle mass and muscle strength among the sarcopenic elderly population. Exercise promotes both the physical and mental health of the elderly population.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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Fox, B., et al. 2015. Adherence to a standardized protocol for measuring grip strength and appropriate cut-off values in adults over 65 years with sarcopenia: a systematic review protocol. JBI Database of Systematic Reviews and Implementation Reports, 13(10):50–59.


