Effect of Obstacle Training in Frailty among Geriatric Population

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Abstract

Background: This study was developed to determine the effectiveness of obstacle training in frailty among geriatric population.

Purpose: The purpose of the study is to evaluate the effectiveness of obstacle training in frailty among geriatric population and to analyze the balance and gait analysis and number of falls.

Method: A quasi experimental study was done in geriatric old age home with 30 samples by convenient sampling technique, allotted in a single group. In phase 1 the prevalence of frailty among Geriatric population will be examined using the Edmonton frail scale. In phase 2 the Tinetti scale and morse fall scale were used as outcome measures.

Results: According to the statistical analysis there is a clinically significant in groups, p value >0.001.

Conclusion: We concluded that obstacle training has an improvement in reducing risk of frailty among geriatric age group population.

Introduction

The prevalent clinical condition of frailty among older people carries a higher risk of undesirable health issues, such as falls, recurrent impairment, hospital stay, and mortality.¹ Despite the fact that it has been established that frailty is a health issue that is separate from concurrent conditions, ageing, and disability.² There are some other characteristics that go along with frailty. Sarcopenia, deterioration of the physiological system of the body, and cognitive deficits are also seen as signs of frailty.³ A stay in the hospital mortality, and morbidity risks are typically elevated by age-related illnesses, including those already described. They also lessen independence in doing activities of everyday living (ADL) duties.⁴ Multiple factors, such as age, sex, economic indicators, and disease pressure, have been associated with the development of frailty in community residents.⁵ Frailty is more common in older age groups (30.1%) than in younger age groups (12.2%), and it is more common in women (32.4%) than in males (10.1%).⁶

The phenotype model, which stresses functional evaluation, and the overall deficit conditions approach, which highlights impairments in the areas of comorbidities, are the two main groups for the present frailty assessment instruments.⁷ In order to
help non-geriatricians in the west of Canada identify and assess elderly people who are frail in the primary care context and at their bedsides, the Edmonton Frail Scale, a performance-based multidimensional frailty assessment instrument, was developed. The EFS consists of eleven items, nine of which are in different categories, including mental, social assistance, mood, dietary habits, and functional performance. The Edmonton frail scale was found to be a valid indication of frailty after carefully examining the patient’s medical records and physical examination. Due to an increased susceptibility to inadequate homeostatic recovery following a stress, the severity of negative results, such as falls, confusion, and disability, is heightened in an advanced stage of frailty. In the CHS population, the relationships between frailty, comorbidity, and impairment were investigated.

Frailty and comorbidity, which is defined as having a minimum of two of the nine diseases mentioned above (myocardial coronary artery disease angina, a congestive cardiac failure, claudication, arthritic pain diabetes, cancer, high blood pressure, and a chronic obstructive was present in 46.2% of the population. 21 persons, or 5.7% of the overall population, were considered frail and disabled, which can be defined as someone who has restrictions in at least one aspect of daily living. It is relevant that 26.6 percent of the research group’s members showed frailty underlying comorbidities or disability. This study supports frailty as a distinct concept with regards to comorbidity and disability. Recent studies, however, suggest that this combination is increasingly frequent and worse with growing frailty. Impaired stride and balance, which are two of frailty’s key characteristics, increase the chance of falling. A “hot” fall is a minor illness that reduces the body’s posture below the critical threshold needed to preserve gait integrity. Spontaneous falls can occur when essential postural functions (vision, balance, and strength), such as in more severe cases of frailty, are no much longer adequate for navigating securely through undemanding surroundings. All spontaneously occurring falls are frequently brought on by a psychological response known as “fear of future falls,” which severely restricts one’s mobility. Clinical care for fragile patients can be difficult to all those involved, including patients, their caregivers, and medical professionals. Frail elderly people often experience medically and psychologically complex issues, and weakness occurs throughout a range that is frequently not clinically evident until at an extremely late stage, creating a unique chance for interventions designed to full fill the specific needs of these patients in each phase of frailty. The complex process of aging is influenced by early embryonic development, environment, and genetics. The fundamental mechanisms of aging have just lately been adequately recognized. Many medical professionals are currently looking for a technique to gauge age physiologically rather than just age in chronological order because aging is a highly varied process.

Frailty has been shown to too strongly correlate with the aging process, leading to the theory that it may represent just such a statistic. The Morse fall scale is used to evaluate a patient’s risk of falling by determining whether or not several risk factors are present in them. There are six parts to it: gait and mental health connected to gait, movement patterns, past experience with falls, further assessment, use of ambulatory assistance, intravenous medication, or use of heparin caps. Each item received an evaluation, with a higher attainable score of 125 scores. Patients with an average score of 45 or less were considered to have a moderate risk of slipping and falling, whereas those with a score of 45 or more was considered to have an elevated risk of falling. The Morse fall scale was used to assess the patient’s fall risk upon admission, every day while they were in the hospital, and any time their condition changed. Electronic medical records were updated with the fall risk assessment findings. The “Edmonton Frail Scale” demonstrated to be a valid measure of frailty in comparison to clinical perceptions of geriatric specialists following their more extensive evaluation. The Edmonton frail scale exhibited good construct validity and reliability, with adequate internal consistency. The discussion touches on 10 various subjects as an outcome of the variety of frailty’s representation.

The nine dimensions that were looked at were: continence, general wellness status, independent functioning, social assistance, pharmacologic condition, nutritional aspect, and mental condition. In order to look at the prevalence of frailty by gender as determined by the Edmonton Frail Scale and its
link with multi-dimensional conditions assessed with specific screening methods, this study assessed the efficacy of the Edmonton Frail Scale to evaluate frailty. It is notable that the Edmonton frail scale was confirmed by non-specialists who lacked formal geriatric care experience. Furthermore, administering the Edmonton frail scale just takes a few minutes.\textsuperscript{15}

Frailty is more common among elderly people who live in communities as they get older: it affects 4\% of those aged 65 to 69, 7\% of people aged 70 to 74, 9\% of people aged 75 to 79, 16\% of people aged 80 to 84, and 26\% of people aged 85 and above.\textsuperscript{16} Frailty often begins before the age of 65, while not all individuals, even those who live to advanced ages, become feeble. Notably, geriatric medicine has recently given way to the specializations of medicine in the applications of frailty markers for prognosis. This means that treatment choices, care objectives, and recovery expectations can all be influenced by an individual’s frailty status. How quickly humans age is affected by the neuro-immuno-endocrine system, food, and exercise. These mechanisms of regulation are less effective in frail older individuals due to mild inflammation, additionally referred to as inflammaging, and severe and unchecked oxidative damage. Other underlying processes are probably involved in the aging process, illnesses associated with aging, and geriatric disorders including frailty. A long-term buildup of unrepaired damage to somatic and stem cell populations may cause them to lose their metabolic and functional capabilities, including the age-related decline in immune function known as immunosenescence. Inflammation and immunosenescence have been proposed as potential causes of sarcopenia, which is a gradual decrease of muscle mass and power in the skeleton accompanied by decreased physical performance. These diseases are typically regarded as defining characteristics of physical frailty. It should be mentioned that similar mechanisms probably explain how the fragility of the respiration, the renal system, hemopoietic, and metabolic processes shows themselves. Therefore, it should not come as a surprise that a lack of proper nourishment may contribute in one way or another to the downward spiral that characterizes frailty.\textsuperscript{17}

Conversely, the majority of interventions that delay or stop the progression of frailty are focused, at least in part, on increasing nutrition. This study set out to find out how common frailty syndrome is in elderly people and how it relates to the likelihood of falling. This research was inspired by the notion that a complex interplay of psychological, social, and biological elements throughout life leads to frailty.\textsuperscript{18}

**Aim**

To determine the effectiveness of obstacle training in frailty among geriatric population.

**Materials and methods**

The Edmonton Frailty Scale was used to assess the frailty of 120 elderly persons. Of the 120, 67 were found to have moderate to severe frailty, and 30 subjects were randomly chosen using a covert opaque envelope. This 30-sample quasi-experimental investigation was carried out. The study was conducted at Elder’s Resorts in Sriperumbudur. Ages between 60 and 80, all genders, and Edmonton frail scores between 8 and 17 were included into consideration. Exclusion criteria include severe osteoporotic individuals, those with an Edmonton fragile score of less than 8, mental health issues, and hearing and vision impairment. All participants provided their verbal or written consent. The collection of data began in January 2023, and treatment sessions began in February 2023 for four weeks.

**Selection criteria:** Edmonton frail score between 8-17, age between 60 and 80, both gender, previous history of fall one year ago were included.

**Exclusion criteria:** Edmonton frail score less than 8, psychological disorders, hearing and visual impairment, severe osteoporotic patients.

**Outcome measure:** The Edmonton Frail Scale, phase 1, is used to gauge the prevalence of frailty. The Edmonton Frail Scale, an instrument used to measure frailty, comprises nine subscales that evaluate mental processes, general well-being, independent functioning, interaction with others, medication use, diet, state of mind, urinary continence, and ability to function.

In phase 2, the Morse fall scale is utilized to identify the risk factors of falling. This scale has six characteristics, including fall history as a whole, secondary diagnosis, use of ambulatory aids, use of intravenous devices, impaired movement patterns, and impaired mental status.
A three-point ordinal scale with the values 0, 1, and 2 has a gait score and a balance score on the Tinetti scale. It is a person’s feeling of balance, stability, and fear of falling during activities of daily living.

**Procedure**

One group of 30 samples received obstacle training that included zigzagging and stepping over obstacles. Figure-eight walking, random walking, and hurdles that get higher and higher. The institutional ethical committee approved the research. Obstacle walking will be given for four weeks, three times each week for 30 minutes each day with a minute of relaxation between exercises.

At the conclusion of the fourth week after the intervention, the same baseline measurements were taken.

Materials required: ridges, cones, hurdles, stopwatch.

**Result**

The baseline measurement was conducted both before and after the intervention, and a total of 30 samples were allocated to one group. Tabulated values for the pretest and posttest are used. The baseline measurement has improved, as seen by the posttest’s mean and standard deviation. Clinical significance was shown by the p value of 0.0001.

**Table 1: Shows Baseline Measurements**

<table>
<thead>
<tr>
<th>S. NO</th>
<th>OUTCOME MEASURES</th>
<th>PRE-TEST</th>
<th></th>
<th>POST-TEST</th>
<th></th>
<th>T-VALUE</th>
<th>P VALUE</th>
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</thead>
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<td></td>
<td></td>
<td>MEAN</td>
<td>SD</td>
<td>MEAN</td>
<td>SD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>TINETTI SCALE</td>
<td>12.8</td>
<td>2.27</td>
<td>19.73</td>
<td>1.38</td>
<td>14.16</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>2.</td>
<td>MORSE FALL SCALE</td>
<td>34.5</td>
<td>3.79</td>
<td>28.75</td>
<td>3.22</td>
<td>6.33</td>
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</tbody>
</table>

**Discussion**

The wide range of outcomes was identified by review research utilizing meta-analysis that revealed a range of 6.7 to 44.0% and supported the present findings. Other studies discovered a percentage around 7% and 10.5% lower than those obtained here, which could be attributed to the characteristics of individuals with better economic or environmental circumstances, where a longer life expectancy is associated with a higher standard of living. The health-related standard of life is intimately associated with frailty and can be improved or decreased depending on the economic or social conditions of the elderly patient.

Seniors who have pre-frailty conditions make up a sizable portion of the population who need to be identified early and who have a 13 to 31% increased risk of becoming frail. Important to note is that it is a serious condition as it only identifies the illness in its early stages, indicating a need to take additional preventative actions to delay the emergence of frail and the possibility of loss of ability to function. Exercise programs are helpful for elderly adults who are weak, according to a systematic review. Only a few studies have examined the effects of exercise on frailty status and frailty phenotypes, with a large number of studies focusing on how exercise improves physical performance.

A systematic review found that exercise regimens are beneficial for frail older persons. Few studies have looked at how exercise affects frailty status and
specific frailty phenotypes; instead, most of them have focused on how exercise affects improving physical performance. The different elements of frailty must be distinguished in order to understand how the intervention will affect particular features of the frailty phenotype as opposed to the overall frailty state. Gait speed is strongly correlated with changes in a person’s frailty state. The most reliable indicator of chronic impairment and dangerous falls is slow gait speed. A previous comprehensive review found that multidimensional interventions, such as exercise in combination with nutrition like protein supplements, are more effective than mono-domain interventions, such as exercise alone, at increasing muscle mass and stopping unintentional loss of weight. The Asia Pacific health community’s recommendation for managing the symptoms of frailty recommends calorie and protein supplementation under certain circumstances for weight loss. This suggests that the lack of a large reversing rate of unintentional weight reduction in our current trial may be due to the emphasis on a particular form of physical activity rather than a holistic intervention. The goal of Ganea et al. was to establish a connection between frailty and the evaluation of fall risk.

The authors conducted Tinette tests and looked into body posture analysis in this work. The posture assessment was researched using the information produced by the inertial measurement devices mounted on the trunk.

However, the findings also failed to establish a direct link between frailty and the risk of falling. It is widely believed that 32 nutritional intervention is a crucial part in managing frailty. But a sizable proportion of trials in diverse populations of elderly people at risk of malnourishment have fallen short of establishing overwhelmingly beneficial effects on physical activity and functional outcomes. Due to this variability, it is challenging to determine the one program that would be most effective for a certain frail group. It may be argued that programs focusing on many physical abilities (strength, endurance, balance, and flexibility) improve performance in terms of older persons’ overall functional capability. In addition, despite improving the generalization and accuracy of external data, the variety of elements in the CTL could also affect the particular results of the training.

Conclusion

According to the abovementioned findings, obstacle training has a positive impact on frailty, balance, and the risk of falling in the elderly population. Additionally, participants’ fall rates have decreased over the course of three months.

Ethical clearance: The ISRB committee of a private hospital and institution in Chennai has provided its clearance for the conduct of human research that complies with all applicable national laws, institutional regulations. (Application Number 01/058/2022/ISRB/PGSR/SCPT).

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References


