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Abstract

Objective: The Otago exercise program is a strengthening, balance and walking program designed to decrease falls in community-dwelling older adults. Few studies have assessed the effects of the Otago program in an assisted living environment. The purpose of the current study was to assess the effects of an Otago-based home exercise program in decreasing falls and the risk of falls in older adults living in assisted living facilities.

Method: Retrospective chart review of 30 patients from two assisted living facilities in Central Florida, eighty percent were female (n=24) with a mean age of 86.08 years who are at risk for falls as determined by the Tinetti Performance Oriented Mobility Assessment (POMA), living in an assisted living facility, and treated with an Otago-based intervention by home health physical therapy. The outcome measures were the number of falls and the Tinetti POMA scores.

Results: The number of falls significantly decreased (t=10.82, p<0.01) after home health physical therapy with Otago based-exercise intervention. The exercise intervention resulted in a significant improvement in Tinetti POMA scores (t=-10.708, p<.001), which indicated reduced risk for falls in these individuals.

Conclusion: An Otago-based strengthening and balance home exercise program can potentially be used to decrease the number of falls and decreasing the risk of falls in older adults living in an assisted living facility.

Introduction

Falls in the elderly are becoming a major public health issue as the incidence of falls and the number of older adults continues to increase.¹ Nearly one third of older adults in the United States experience a fall each year^{2,3} increasing their risk of early death.⁴ More than half of the falls in the elderly result in some form of injury.⁵ Exercise alone or in combination with other risk reduction, seems to be the most important element in decreasing the risk of falls in the elderly.² Strengthening and balance training have shown to be the most important element of an exercise program designed to reduce the risk of falls in the elderly.⁶ The Otago exercise program is an individually tailored home based strength and balance exercise program that has been shown to be effective in decreasing the falls and injuries in older adults.⁷

Methods and Materials

A retrospective chart review was conducted with patients records obtained over a 24 month period from September 2011 to September 2013. The study was conducted on an assisted living facility for seniors located in the greater Orlando, Florida area. The assisted living facility has 110 residents many of which experience falls and fall related injuries each year and are referred by their physicians to home health physical therapy for strengthening exercises and fall interventions.

A master list was obtained from the home health agency for all persons living in the assisted living facility who were referred to home health physical therapy and who are at risk for falls as determined by the person's Tinetti POMA score. The charts that were selected for inclusion in the study if at the time of referral to physical therapy the person was 60 years old or older, at high risk for falls determined by the Tinetti POMA score, received strengthening exercises based on the Otago exercise program, able to ambulate short distances with or without an assistive device, and was referred to home health physical therapy within the designated time frame of the study (September 2011 to September 2013).

Baseline characteristics and outcomes before and after intervention were compared using the paired t-test. The number of falls and the fall risk as identified by the Tinetti POMA were the main outcome measures in the study. The number of falls 12 months prior to physical therapy referral and subsequent Otago-based intervention and the number of falls 3 to 12 months after the Otago-based exercise intervention were collected from the records. The risk of fall as determined by the patient's Tinetti POMA scores was assessed on the first home visit and the last home visit by the physical therapist.

Figure 1. Number of Falls Before and After Otago-based Intervention

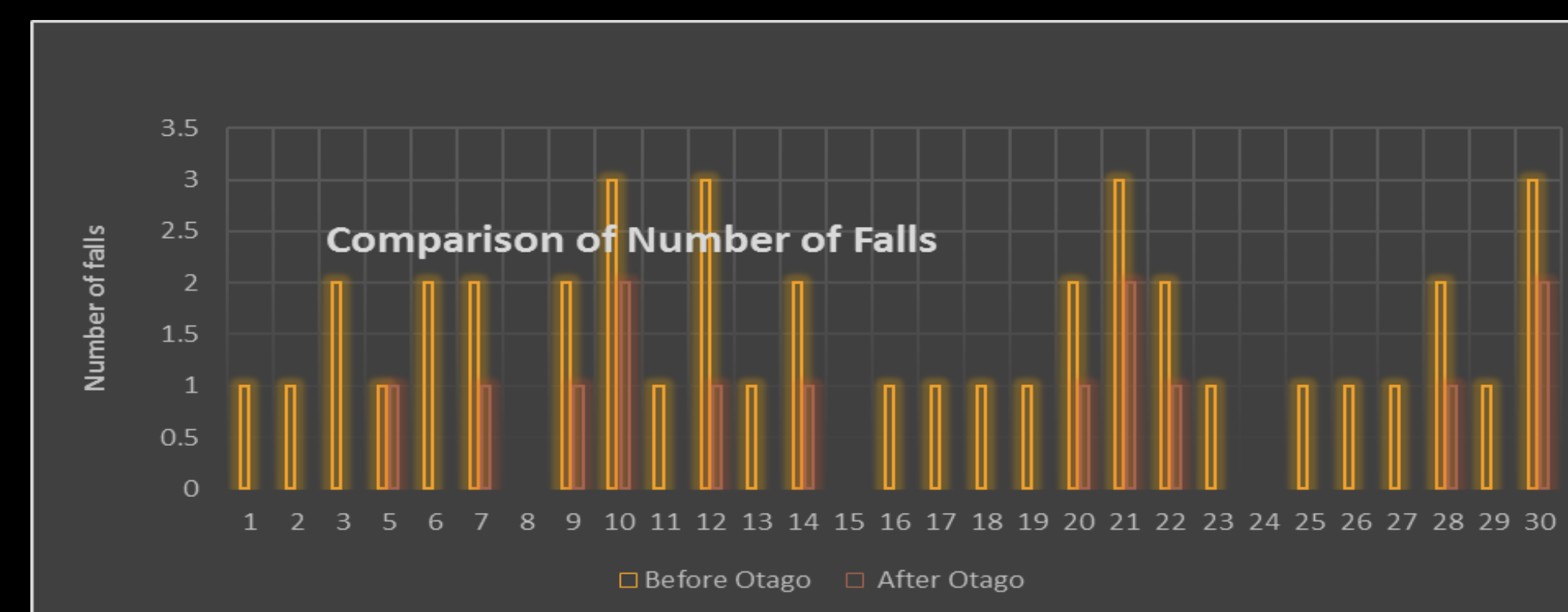


Figure 2. Frequency of Falls Pre-Intervention

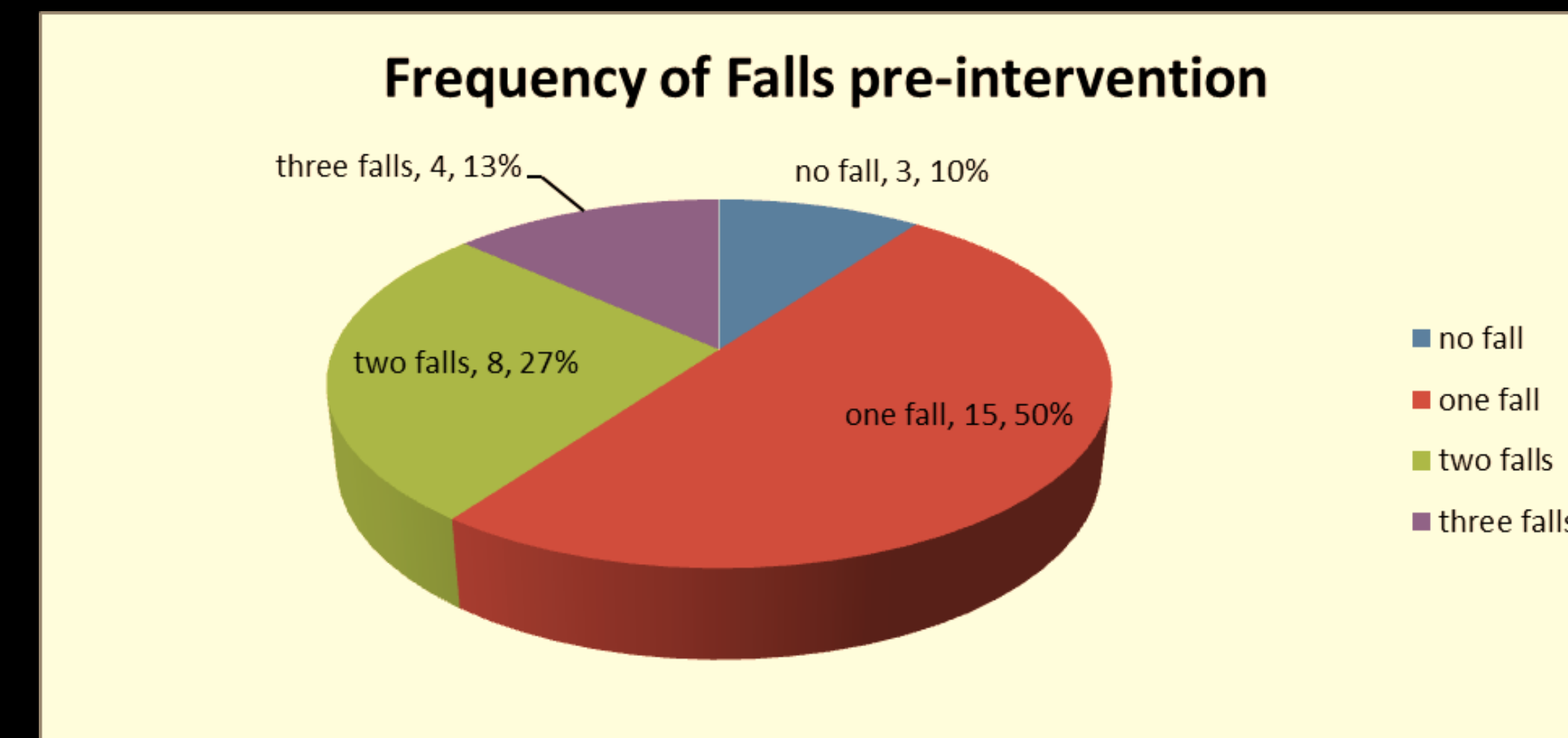
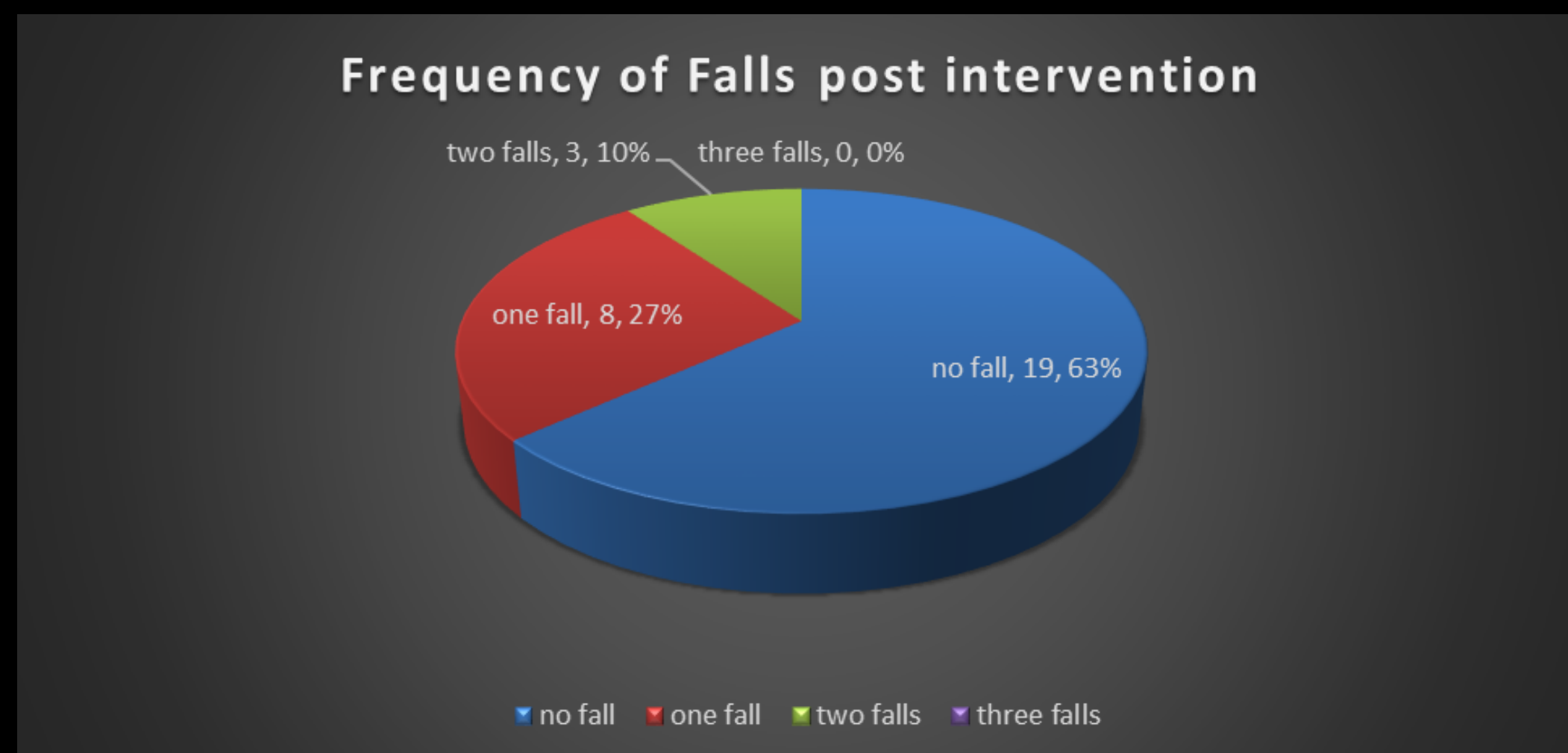


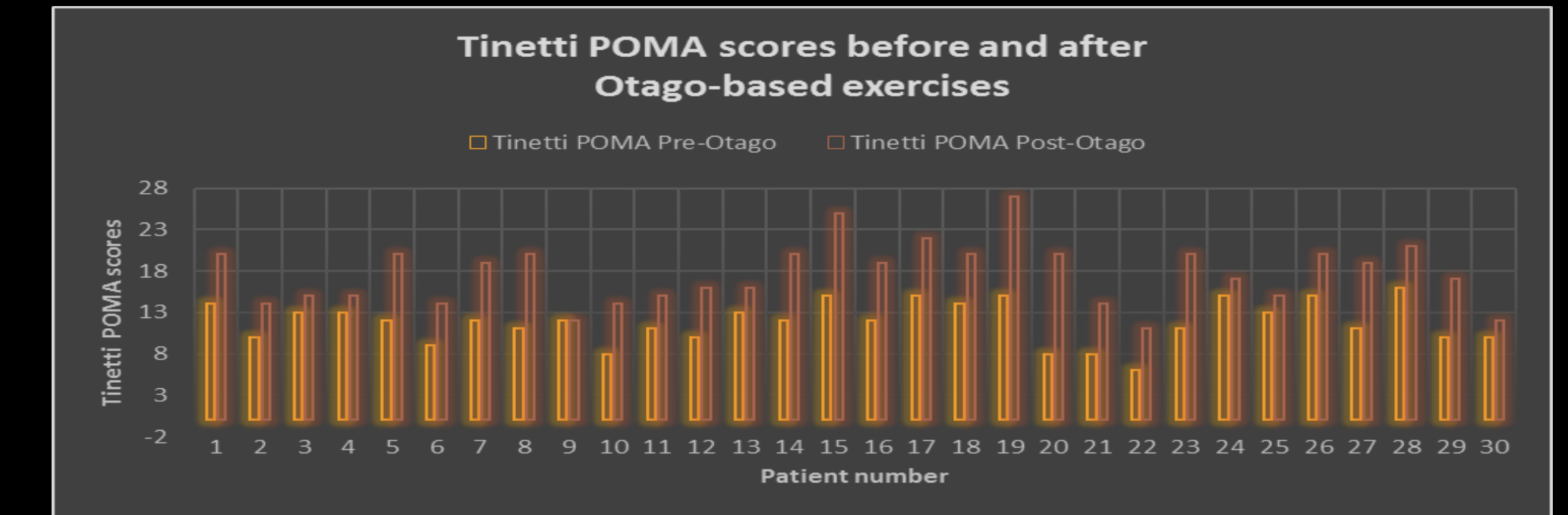
Figure 3. Frequency of Falls Post Intervention



Results

Paired t-test shows that the number of falls significantly decreased after home health physical therapy with Otago-based exercise intervention. The mean (SD) of falls has decreased from 1.43 (0.85) fall per person to 0.46 (0.68) fall per person. Paired t-test revealed that the risk of falls, as identified by the Tinetti POMA, has significantly decreased after home health physical therapy with Otago based-exercise intervention. The mean (SD) Tinetti POMA score significantly improved from 11.80 (2.52) before the Otago-based exercises to 17.63 (3.79) after the Otago-based exercise intervention.

Figure 4. Tinetti Scores Before and After Intervention



Discussion

The results of the study have shown that an Otago-based exercise program could be effective in reducing falls in the elderly. There was a significant decrease in the number of reported falls before and after the Otago-based exercise intervention with 43 falls reported prior to the intervention and 14 falls reported after the intervention. After the intervention, 63.3% (n=19) of the patients did not report any fall compared to 10% (n=3) of patients not reporting any fall prior to the intervention, an improvement of almost six times in the number of reported falls before and after the intervention. The number and percentage of falls have decreased significantly before (Fig.2) and after (Fig.3) the Otago-based physical therapy intervention. Data analysis showed a significant benefit from an Otago-based exercise program. Paired t-test revealed a statistically significant difference on Tinetti POMA scores of the patients before and after the intervention. The Tinetti POMA scores of patients in this study who have undergone an Otago-based exercise intervention improved an average of 5.83 points, a change in scores that has exceeded the MDC reported in the literature.⁸

Conclusions

The authors found that an individually tailored Otago-based home exercise program, prescribed by a physical therapist, may be effective in preventing falls and decreasing the risk of falls in older adults living in an assisted living facility. This exercise program includes strengthening and balance exercises which are the key components of an effective fall reduction exercise program. Findings from this study demonstrate the need for more research to examine the effects of Otago-based exercises against a comparison group to aid in practice recommendations for physical therapists working in the home health setting to patients who have history of falls and patients who are at risk for falling.

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