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PHYSICAL REHABILITATION REGIMENS DESIGNED TO ENHANCE INDIVIDUAL CAPABILITIES IN PURSUIT OF ADL IN THE FRAIL ELDERLY, IN DUE CONSIDERATION OF THEIR RESPECTIVE OVERALL FITNESS BACKGROUND IN YOUTH

INTRODUCTION

Although functional disorders in performing simple tasks of daily living (ADL) pose a major problem in providing care to swelling numbers of the frail elderly, specifically structured, individually tailored physical rehabilitation programme might help to have it alleviated [3, 6]. The present study aimed therefore to assess the effectiveness of two discrete rehabilitation regimens in enhancing overall functional capabilities and gait velocity in the frail octogenarians.

Despite receiving a lot of medical attention and nursing care on a daily basis, the elderly nursing homes residents lead a predominantly sedentary lifestyle. So paradoxically, whatever benefits they might actually draw from their residential status in terms of specialist medical care and regular nutrition, is being, in fact, eroded by insufficient physical activity [8].

Their community-dwelling peers, on the other hand, being often left to their own devices, are consequently forced to put in considerably more physical effort into moving around on their own and attending to their daily chores, so consequently their overall mobility and individual functional capabilities remain on a much higher level and are, therefore, much less likely to deteriorate at the same rate as those of the nursing home residents.

The present author was encouraged by the results of his previous, closely related research to establish the correlation, if any, between different fitness backgrounds in youth among the frail elderly, whilst duly discriminating between the community dwellers and nursing home residents.

METHODS

The study lasted 12 weeks and embraced 40 subjects (mean age 81 years) randomly split into two groups: Group I – 23, (subjects with no athletic experience in youth), Group II – the controls – 17 (subjects particularly fit in youth and adept in diverse sporting pursuits). Group I was assigned a more intensive rehabilitation regimen embracing multi-sensory training, instruction on how to perform postural shifts safely and walk effectively, whereas Group II – a variety of exercises and brisk walking. A timed UP & GO test [7] was applied to assess individual mobility before the study and upon its conclusion (inclusive of gait velocity assessment at a 10 m distance).

No statistically significant differences between the respective groups were observed with regard to age, body height, weight, individually administered medication, or incidental use of walking aids. The baseline characteristics of the subjects are provided in Table 1. In the statistical analysis, the arithmetic mean and standard deviation values were applied. Student's t-test was used to compare the results obtained in the respective groups prior to the commencement of the study and after 12 weeks. The statistical significance was established at $p<0.05$.

All data yielded by the study were subsequently processed with the aid of Statgraphic for Windows® software package.

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Table 1. Baseline characteristics of subjects prior to commencement of rehabilitation

Baseline characteristics	Group I (n=23) x ± SD, (%)	Group II (n=17) x ± SD, (%)	Statistical Significance
Mean age	82 ± 3.2	80 ± 3.7	Ns*
Gender (F/M)	14/9	11/6	Ns
Body Height (cm)	160.9 ± 7.5	166 ± 9.4	Ns
Body Weight (kg)	74.2 ± 7.9	71.6 ± 4.9	Ns
Average number of prescription medications	4.7 ± 2.4	3.1 ± 1.5	Ns
Concomitant disorders	3.1 ± 1.5	2.1 ± 1.3	Ns
Timed UP & GO test (s.)	24.1 ± 3.5	22.9 ± 5.2	Ns
Usual Gait Velocity(m/s)	1.03 ± 0.07	1.06 ± 0.07	Ns
Using aids for walking	52%	48%	Ns

*Ns – statistically non-significant

Physical rehabilitation regimens for Group I

The physical rehabilitation regimen allocated to Group I, comprising multi-sensory exercises with the aid of a ball cushion, a timed resistance sequence on a pedal exerciser unit, was carried out by each patient at home under strict supervision, broken down into 50-minute long sessions 3 times weekly.

RESULTS

Statistically significant improvement ($p<0.05$) was noted in Group I in the timed UP & GO test score (mean time 24.1 sec. before vs. 18.3 sec. after) as illustrated in Fig. 1. Upon conclusions of the programme statistically significant ($p<0.05$) improvement was noted in Group I (mean usual gait velocity 1.03 m/s vs. 1.13 m/s), as illustrated in Fig. 2, whereas all results in the Control Group II clearly lacked statistical significance.

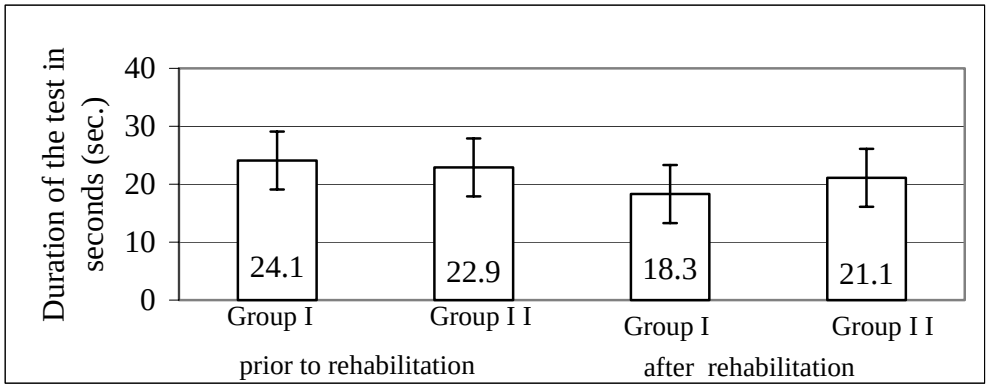

Figure 1. The results of the timed UP & Go test

Physical rehabilitation regimens for Group II

Each patient exercised at home three times a week (3 x 50 min), also under strict supervision, pursuing a variety of structured exercises, in conjunction with some brisk walking outdoors.

Blood pressure and pulse were routinely monitored in both exercise groups.

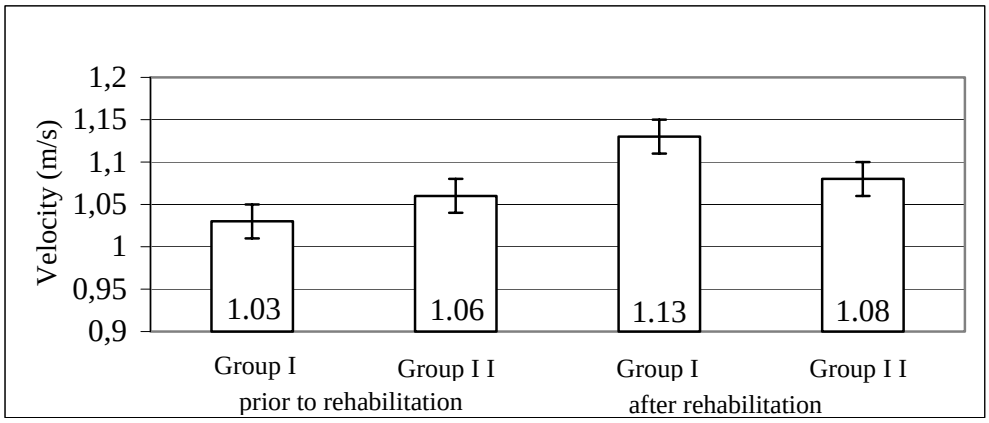

Figure 2. Usual gait velocity, prior to and after physical rehabilitation regimens

DISCUSSION

The higher timed UP & GO test scores achieved by the nursing home residents may well be justified by the fact that they had been particularly fit and athletically-oriented in their youth, as this is bound to have been reflected in their overall physical prowess; some age-related degeneration notwithstanding.

According to Podsiadlo et al. [7], the timed UP & GO test scores below 20 sec. merely reflect an elderly person's ability to walk at a normal pace over a short distance only.

Structured physical rehabilitation programs, especially those specifically designed to offer physio-therapeutic assistance to the frail elderly, even those who had no first-hand athletic experiences in their youth whatsoever, are believed to offer tangible benefits to all frail elderly who are keen enough to maintain a modest degree of self-discipline to pursue them regularly and fairly enthusiastically.

The improvement in mobility achieved during the present study, as well as reported by other investigators, whereupon structured balance exercises had been applied in the elderly subjects, only goes to show that the two are strongly correlated. For instance, the gait speed improvement in the elderly subjects (mean age 82) who pursued a combination of resistance and balance exercises, respectively, for 3 months, was reported by Judge et al. [4], whereas Fiatarone et al. [2], who assigned comprehensively structured resistance sequences to a group of subjects aged over 90, also noted substantial improvement in their gait.

Since no such an improvement has ever been reported in the younger subjects, resistance exercise sequences might be reasonably expected to be therapeutically effective only when applied to the subjects aged over 70, as might be readily inferred from the studies of Brown et al. [1].

This particular observation should therefore be regarded as important pointer in designing all structured rehabilitation regimens for the frail elderly, so as to make them always fully compliant with the respective age group specifics. Obviously enough, any such exercise sequences should always specifically cover the selected muscle groups only, in order to safeguard against any potential risk of overstraining.

If common experience in geriatric care is anything to go by, even those elderly who had been physically quite active and even athletically-oriented in their youth, are prone to succumb rather quickly to the age-related degeneration, and consequently find their routine daily tasks and chores to pose a real challenge, as their overall mobility gets progressively impaired. It is therefore imperative that they be provided with specialist assistance specifically aimed at addressing the issue of age-related frailty comprehensively, with a view to effectively preventing an uncontrolled slide into care-dependency.

Conclusions:

A specifically structured physical rehabilitation routine comprising diverse resistance and multi-sensory exercises is believed to enhance significantly individual capability for effective pursuit of daily living activities in the frail elderly subjects who boasted no first-hand athletic experience in their youth whatsoever.

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