

STUDIES IN PHYSICAL CULTURE AND TOURISM
Vol. 13, Supplement, 2006

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**PHYSICAL REHABILITATION REGIMENS PREPARING THE FRAIL ELDERLY
WITH CARDIO-VASCULAR DISORDERS TO COPE EFFECTIVELY AFTER
AN INCIDENTAL FALL**

INTRODUCTION

Many frail elderly experience serious difficulties when executing postural shifts, and around 50% of incidental fall victims are unable to get up again unassisted, despite having sustained non-injurious falls; this consequently leaving them exposed to further potential hazards [7]. The present study aimed therefore to juxtapose diverse rehabilitation regimens in terms of their respective effectiveness in aiding the frail elderly diagnosed with cardiovascular disorders in the safe execution of routine postural shifts, as well as in coping after incidental falls on their own.

It is common knowledge that ca. 50% of the elderly fallers are unable to cope afterwards unassisted, despite not having sustained any injuries [8, 10, 13]. Such incidents may potentially be fraught with serious consequences, especially when the period of immobilisation on the floor runs into several hours and the victims are unable to summon any help, as this may easily precipitate hypothermia, dehydration and generally contribute to a development of a lasting post-fall syndrome [1, 9].

The results of related studies on the impact of diverse physiotherapy regimens pursued by the present author in groups with serious locomotive disorders encouraged him to continue his investigations, by and large with a view to establishing physical rehabilitation regimens designed to enhance individual functional capabilities in the frail elderly suffering from a diversity of cardiovascular disorders [11]. The present study set out to assess the efficacy of two discrete physical rehabilitation regimens – the backward-chaining method juxtaposed with the conventional one – in specifically helping the subjects with the safe execution of postural shifts and coping after incidental falls on their own.

METHODS

The study lasted 12 weeks and covered 60 subjects (40 F, 20 M; mean age 82 years) randomly split into two groups (Group I – 38, Group II – 22; baseline characteristics provided in Table 1). Group I was assigned an intensive rehabilitation regimen comprising standard exercises and assorted back-chaining method exercises, whereas Group II followed a variety of standard exercises and made use of the conventional teaching method in their endeavours to get up after fall.

A timed UP & GO [5] test was applied to assess individual mobility and the Pilet and Swine test [4] to cope after an incidental fall, both prior to the commencement of the study and after its conclusion. The results were subsequently assessed with Student's t-test and non-parametric Wilcoxon test. All data were subsequently processed by Statgraphic for Windows[®] v. 3.1. software package.

Physical rehabilitation regimens for Group I

The physical rehabilitation regimen allocated to Group I was carried out by each patient at home, although under strict supervision of a trained physiotherapist only. The regimen, pursued in line with a backward-chaining method [11], was broken down into 50-minute long sessions 3 times weekly.

Physical rehabilitation regimens for Group II

Each patient exercised at home three times a week (3 x 50 min) in line with the guidelines set down by the conventional method [11], under strict supervision of a trained physiotherapist.

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

Table 1. Baseline characteristics of subjects

Baseline characteristics	Group I (n=38) x ± SD, (%)	Group II (n=22) x ± SD, (%)	Statistical significance
Mean age	83 ± 4.3	81 ± 5.1	Ns ^{***}
Gender (F/M)	22/16	14/8	Ns
SBP*	138.6 ± 15.4	141.2 ± 13.2	Ns
DBP**	88.2 ± 7.8	82.7 ± 8.6	Ns
Average number of prescription medications	5.4 ± 2.7	4.1 ± 3.4	Ns
Concomitant disorders	4.1 ± 1.8	3.9 ± 1.6	Ns
Hypertension	84%	82%	Ns
Locomotive disorders	71%	73%	Ns
Pulmonary disorders	55%	59%	Ns
Diabetes mellitus	37%	41%	Ns
Neurological disorders	42%	50%	Ns
Timed UP & GO test (s.)	26.5 ± 3.5	26.1 ± 5.2	Ns
Fall in past 6 months	61%	59%	Ns
Using aids for walking	50%	41%	Ns

*SBP – Systolic Blood Pressure, ** DBP – Diastolic Blood Pressure, ***Ns – statistically non-significant

RESULTS

Statistically significant improvement ($p < 0.05$) was noted in Group I only. In the timed UP & GO test score the overall improvement was noted in the majority of subjects (mean time 26.5 sec. before vs. 18.2 sec. after), as illustrated in Fig. 1. Statistically significant improvement ($p < 0.05$) of individual capability for rising unassisted after an incident fall was noted among 20% – 30% subjects in this group, as illustrated in Fig. 2.

DISCUSSION

Comparison of individual functional capabilities in coping after sustaining an incidental fall was also pursued by Hofmeyer et al. [2] who reported significant improvement in the majority of subjects barely after two weeks into the programme. Far greater efficiency in individual coping after a fall was established by Żak et al. [12] who reported significant improvements in a group of elderly female patients suffering from a variety of cardiac disorders after 3 weeks into the structured rehabilitation regimen.

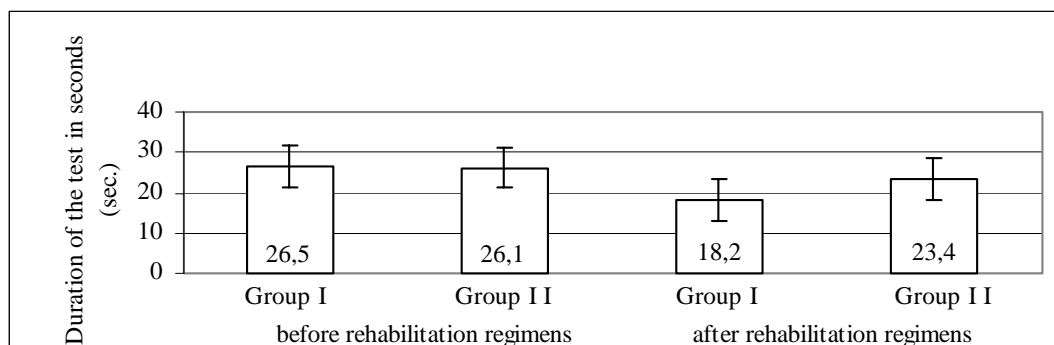
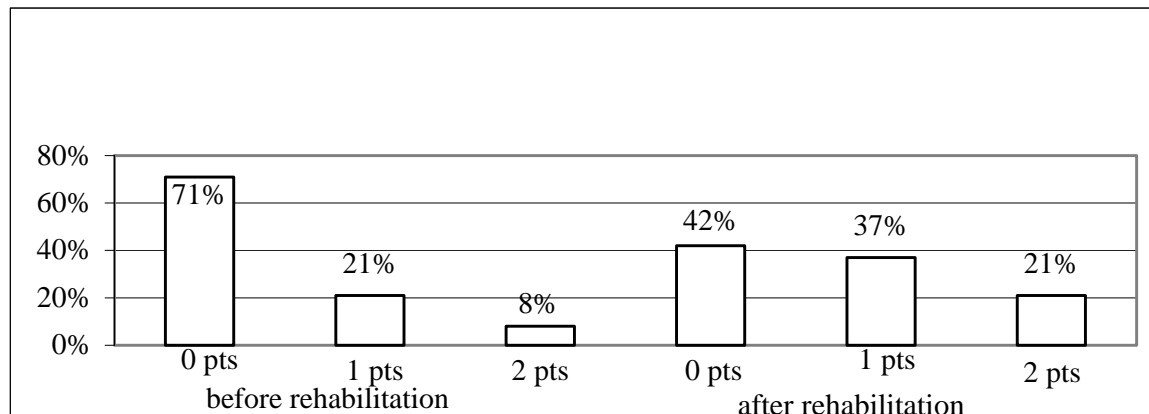


Figure 1. The results of the timed UP&GO test



0 pts – if a subject requires assistance. 1 pts – if a subject requires the use of walking aids (e.g. walker, cane). 2 pts – if a subject does not require any assistance whatsoever

Figure 2. Possibility of regaining a fully upright position from a face-down position on the floor-Group I

The conventional method, on the other hand, proves to be far less effective as a therapeutic option, in comparison to the backward-chaining one, as evidenced by the respective findings of both McCaber and Žak [3, 11].

Improvement achieved by the subjects following the more intensive regime appears to be particularly significant, as those who were capable of scoring better in the timed UP & GO test were also found to be perfectly capable of executing postural shifts safely and make use of the toilet facilities virtually unassisted, or at least without any undue difficulties.

Also Reece et al. [6] pointed to greatly enhanced individual functional capabilities resulting in more effective way of coping after an incidental fall among the subjects who had actually been taught a variety of practical skills by way of strictly following a series of structured exercises incorporated in the backward-chaining method, which also happens to be very much in line with the findings yielded by the present study.

It would appear, therefore, that the main focus in designing effective therapeutic regimens should always rest on practicality and making the frail elderly subjects acutely aware that only through mastering a variety of practical skills effectively can they expect to regain at least some of their eroded functional capabilities, as well as boost their self-confidence in facing up to everyday tasks with a modest degree of self-reliance.

Conclusions:

A structured physical rehabilitation routine making use of the back-chaining exercise sequence is believed to offer multi-faceted benefits in aiding the frail elderly subjects suffering from diverse cardiovascular disorders

in the execution of safe postural shifts and improving their overall functional capabilities.

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