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Original article

OPERATIONAL STRATEGIES FOR SAFEGUARDING HEALTH USING KINETIC MEANS IN THE INSTITUTIONALIZED ELDERLY

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Abstract*

Aim. This study aims at emphasizing the importance of the constant use and in an organized manner of kinetic means in order to safeguard the health of the institutionalized elderly.

Methods. The research included a number of 40 subjects aged between 64 and 72 years, divided into two groups: the experimental sample (n=20) which received a kinesiotherapy programme (medical gymnastics, massage, cardio training) and the control sample (n=20) which carried out its day-to-day routine refusing to participate in the programs carried out within the facility. The assessment of health during the research was made based upon assessment tests and scale: the 1- mile walking test, Ossermann index, physical activity index, Pichot's fatigue scale.

Results: The results obtained in all the tests were processed by using inferential statistics, thus obtaining in the final assessment a statistically significant difference between the two samples at $p < 0,001$ (Mann-Whitney test) for all the tests and scales applied.

Conclusions: Kinesiotherapy in the elderly would be more functional rather than analytic, the key being to achieve balance for walking, effort tolerance and usual gestuality, thus taking action against the elderly's inactivity and the tendency to go into their shells and fight off the feeling of uselessness.

Keywords: effort, medical gymnastics, elderly, cardio training, massage.

Introduction

The aging process should be comprehended in a polyfactorial and causal context where adaptive and compensation mechanisms play a key part. On the basis of these ideas, aging should be monitored in such a way as to slow down the deterioration processes for normal old age-related states to set in as late as possible (Bogdan, 1992).

This paper promotes exercising depending on every elderly's health status with a view to maintaining the active ability and delaying the aging phenomenon. Thus, physical training allows the elderly to improve or expand their independence level, being able to care for themselves (Lazăr, 2007).

The current concern of those taking care of the elderly is not just on how to increase life expectancy, but also on how to make third age population be active people with useful preoccupations, not only to their family, but also to society and to preserve and develop them during their life course for creative purposes, both physical strength and intellectual potential (Cristea, 1990).

The most appropriate approach of the elderly subject, with regard to the use of physical exercise, is to use a sequence of harmonious, rhythmic moves, close to the natural way elderly

people move (Sbenghe, 1999).

All exercise programs shall be prepared so that they are easy to understand and perform, and overstrains should always be excluded. The exercises will be dynamic, lying emphasis on employing the muscles less trained during daily activities, and movements will be made on full possible maximum range of every individual, without pain and permanently correlated with breathing (Dan, Lozincă et al., 2007).

Thus, if along with other measures (diet, healthcare etc.) the physical exercise programs offered lead to the increase in the active life expectancy (at least in some of the individuals) this would generate not only great satisfaction (for those in question, their families and occupational satisfaction specialists), but also a reduction of the social burden caring for and maintenance of a dependant elderly, handicapped or with a disability involves (Dumitru, 1984).

Methods

The purpose of this research was to identify, choose and combine the most effective kinetic methods and means in order to safeguard health in the institutionalized elderly at optimal parameters and

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to ensure his independence in carrying out daily activities.

Thus, the hypothesis to have been the basis for this paper, from this perspective, aimed at the idea according to which if third age people saw the beneficial effects from exercising on the human body, we will then witness their change of attitude and behavior with regard to the attitudes and interests in the geriatric rehabilitation programs, and in terms of health- promotion, leads to health status improvement and extension of lifetime.

Working method. The research was conducted in a Nursing Home equipped with 2 kinesitherapy rooms having the proper materials needed to carry out the kinesitherapy sessions under optimum conditions. The research included a number of 40 subjects aged between 64 and 72 years, divided into two groups: the experimental sample (n=20) which received a kinesitherapy program and the control sample (n=20) which carried out its day-to-day routine, refusing to participate in the programs carried out within the facility.

The research model was a mixed one, intra- and inter-subject, within the meaning that the progress of subjects in the experimental sample was monitored for 6 months, as well as the manner in which their progress was different from the subjects in the control sample, so as to remove the maturing effect.

The assessment process ended by drawing-up an observation protocol where, apart from personal information, all the results in the initial tests were registered and, in the end of the rehabilitation process, all final results achieved by every subject separately will be noted as well.

These charts may also comprise observations made during the program by the kinesitherapist, as well as a series of conclusions on the case and recommendations with regard to the kinetic program the researched subject should follow. Consequently, these observation protocols' drawing-up was a basic material for counting results with a view to determine

the subjects' evolution or involution of the experimental sample both in relation to themselves, and in relation to the subjects from the control sample.

The results from initial tests suggest the need to implement exercise programs to aim at all bi-psycho- affective aspects which might improve subjects' health state.

The difficulty of the kinetic programs gradually increased during the research, medical gymnastics programs being interfused over the course of a week with those of cardio training, all tailored to subjects 'age, training degree, and last, but not least, to potential disorders. The massage sessions successfully completed the motion activities contributing to the elderly relaxation, but also to the improvement of subjects' overall blood flow.

Results

The main objective of the research was to capture the progress reported by the experimental sample as compared to the progress of the control sample, when the first underwent a kinetic program especially intended for third age people.

Table 1 - Physical activity index. By applying the inferential statistics' instruments for the physical activity index, a statistically significant different was noted between the initial and final testing of the two samples as follows: in the experimental sample 11 subjects (55%) reported a very good health state and nine subjects (45%) a good health state, the before-after difference being statistically significant ($z = -3,945, p < 0,001$); in the control sample 17 (85%) subjects reported a very weak health state, and three subjects were in poor health (15%), the before- after difference is not significant ($z = -1,000, p = 0,317$). With regard to the difference between the two samples in the final testing, using the Mann- Whitney nonparametric test for two independent samples, a significant difference was noted ($z = -5,542, p < 0,001$);

Table 1 Test statistics – Physical activity index –final

	Physical activity index - final
Mann-Whitney U	0,000
Z	-5,542
P (bilateral testing)	0,000

In table 2 interpreting the data as per the assessment grid, we may notice that in the final test

phase for the control sample, 17 (85%) subjects presented a very weak health state and three subjects



a poor health (15%). As for the experimental sample, 11 subjects (55%) were in very good health, and nine

subjects (45%) had a very good health state.

Table 2 Frequency table. Physical activity index - final

		Physical fitness				Total
		Very weak	weak	very good	superior	
sample	control sample	17	3	0	0	20
	experimental sample	0	0	11	9	20
	Total	17	3	11	9	40

Ossermann index. The before-after difference in this index reported by the experimental sample was significant (Wilcoxon test; $z = -4,008$, $p < 0,001$) which reveals an improvement in muscle strength. The difference between the two samples in

the final test was significant (Mann-Whitney nonparametric test; $z = -5,564$, $p < 0,001$) scores mean being 52, 50 in the experimental sample, and 31, 25 in the control sample (Table 3, 4).

Table 3 rankings table - Ossermann index- final

		Subjects sample	N	Rankings	
				mean	Rankings sum
Ossermann index – final test	control sample		20	10,50	210,00
	experimental sample		20	30,50	610,00
	Total		40		

Table 4 Test statistics – Ossermann index- final

	Ossermann index – final test
Mann-Whitney U	0,000
Z	-5,564
P (bilateral testing)	0,000

Pichot's fatigue scale. None of the subjects in the control sample registered any change in terms of fatigue between the two stages of the experiment.

All the subjects in the experimental sample reported a fatigue reduction, both physical and psychical, the before-after difference being statistically significant at a threshold of 0, 01

Wilcoxon test; $z = -3,969$, $p < 0,001$). Using the Mann-Whitney nonparametric test for two independent samples, a statistically significant difference was noted between the two samples in the final testing ($z = -5,463$, $p < 0,001$), the final scores mean being 3, 95 in the experimental sample, and 18, 45 in the control sample (Table 5, 6).

Table 5 Rankings table – Pichot's fatigue scale- final

		Subjects sample	N	Rankings	
				mean	Rankings sum
Pichot's fatigue scale – final testing	control sample		20	30,50	610,00
	experimental sample		20	10,50	210,00
	Total		40		



Table 6 Test statistics –Pichot’s fatigue scale- final

	Pichot final
Mann-Whitney U	0,000
Z	-5,463
P (bilateral testing)	0,000

VO_{2 max}. This is the most accurate indicator of an individual’s effort capacity and in the control sample it showed five cases of mild decrease, and in ten cases a slight increase; the *before- after* difference was not statistically significant (Wilcoxon; test $z = -1,647$, $p = 0,100$).

The experimental sample subjects reported an increase of the volume of oxygen between the two experimental stages, the mean increasing from 12, 30 in the initial phase to 24, 25 in the final phase; the before-after difference was statistically significant at

a threshold of 0, 01, (Wilcoxon test; $z = -3,920$, $p < 0,001$).

If in the initial phase there was no significant difference between the two samples, in the final phase the difference was major, the scores’ mean for the experimental sample registering the value of 24, 25, and in the control sample at 13, 95 the difference between the two samples being statistically significant (Mann- Whitney test; $z = -5,248$, $p < 0,001$ (Table 7, 8).

Table 7 Rankings table – Maximal oxygen consumption- final

	Subjects sample	N	Rankings	
			mean	Rankings sum
maximal oxygen consumption– final testing	control sample	20	10,80	216,00
	experimental sample	20	30,20	604,00
	Total	40		

Table 8 Statistics table test – maximal oxygen consumption- final

	maximal oxygen consumption- final
Mann-Whitney U	6,000
Z	-5,248
P (bilateral testing)	0,000

Discussions

Statistical analysis and interpretation of all scales and tests applied underline the fact that kinesiotherapy-related activities have been acquired in a pleasant and useful manner by the elderly of the experimental sample, as they evolved in a remarkable dynamic as compared to the subjects of the control sample, acquiring during the experiment all the data necessary for maintaining health at optimum parameters for this age, becoming aware, by their own results obtained, on the importance of movement for ensuring an active longevity;

Gerontology studies with regard to the influence of physical exercise and sports on human health and longevity have shown that athletes enjoy an increase in life expectancy as opposed to the other individuals and most of them are in a better physical

fitness and mental state at old age (Cristea, 1990)

It was also proven that the elderly may increase their VO_{2 max}. by strength (aerobics) training by the same degree as compared to young people (15-25%). Kohrt and colab. found increases of VO_{2 max}. by 23% in the elderly and by 26% in the elderly by a similar physical (4 days/week, 45 minutes/day, at a relative intensity of 80% of maximum heart rate). Increasing intensities of the physical training may materialize into higher values of VO_{2 max}. (Lazăr, 2007).

Maintaining physical vitality using kinetic means, initiating illustrative programmes on old age, acquiring new optimistic concepts on senior citizens are fundamental desiderata for any elderly person and for society.

Effort capacity is reduced in this period by



the restriction to overstrain and to the action of disruptive factors 'action in the external environment, sclerosing phenomena quicken, functional ability of sense organs and nervous system decrease, muscle mobility and speed also decrease (Dicționar de Pedagogie, 1980).

Any kind of physical activity may be practiced after the age of 60 years, starting from morning physical exercises, continuing with walking for at least half an hour in a sustained rhythm. By the age of 45 years practicing a physical activity preserves a cardiac performance and prevents chronic degenerative diseases from occurring.

Between 45 and 60 years, daily practice of an activity is also useful; however it is dictated by health, the doctor being the one to decide the degree and nature of physical exercise.

"Walking after a meal is more effective than an entire pharmacy" summarizes the content of this recommendation.

In other words, our scientific records are focused on promoting the "active elderly" concept which includes, at the same time advantages of older people, and of society.

Generally, the goal is not to recover work skills, but those of an independent life, self-service which would give them confidence in their own strength and would make them want to be active in order to maintain their health status.

The physical exercises programme needs to be designed and introduced early-on, which means before the immobilization syndrome occurs, which will cause the deconditioning process;

By Braun this type of training has the most positive cardiovascular and metabolic effects and in order to develop them and maintain to a person with heart problems, endurance exercises are recommended 3-5 times a week at an intensity of 60-90% of the heart rate or 50-85% of the maximum heart rate reserve over 20-60 minutes (Braun, 1991).

Combining strength training with the one for endurance leads to the increase of VO_2 maximum and fitness significantly higher than any singular training programme (Agre, McCarty, 1995).

Conclusions

The following conclusions may be reached upon analysing the parameters measured in the final tests: Apart from the beneficial outcome on physical level that movement has, there are also the effects on the elderly's mental and social states, manifested by his desire to communicate, to express

what he's going through, relate to those around him, to participate in various activities, thus beating loneliness, a feeling which is quite pronounced at this age;

When carried out daily and with discernment, physical activity ensures a marked mental relaxation, gives the powerful feeling of usefulness and independence. Movement was scientifically shown to favour longevity.

Lack of movement in the elderly leads to the exacerbation of osteoporosis, tendency for constipation, depression, favour urinary and pulmonary infections;

The elderly's active and aware participation in the kinetic programs held within nursing homes depends not only on his desire to adhere to these programs, but also on the kinesitherapist's savoir-faire, on how he chooses and combines the kinesitherapeutic means with a view to constituting complex and enticing activities aiming at improving as many health parameters as possible.

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