

Exercise –a key tool to maintain psycho-emotional well-being in the institutionalized older adults

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Abstract:

Literature states that physical activity increases blood circulation to the brain, improving mental health, maintaining emotional balance, and preventing mental depression, anxiety, panic attacks and memory loss in older adults. By adopting a daily physical activity regimen, negative effects caused by a sedentary life are reduced, ensuring good mental and physical health, especially to individuals in their senescence age, who are in social welfare homes. This study aimed to implement some physical activity models to be applied by the institutionalized older adults and identify potential positive effects on psycho-emotional well-being of those who have actively and consciously exercised, compared to those who preferred to carry out their daily routine within the facility. The study focused on the use of six types of exercise programs, i.e., three exercise programs aiming at the selective influencing of the locomotor system and three cardio training programs. Individuals were monitored via the emotional distress profile, and results showed that the difference between the two groups regarding their psycho-emotional and affective well-being was statistically significant ($p < 0.01$) as calculated by the Mann-Whitney U test for two independent samples. In the final testing phase, the scores of the experimental group varied between 26 and 30, featuring subjects with optimal psycho-affective state, and all subjects from the control group reported a low emotional distress level. Apart from the movement's physical benefits, older people also showed benefits on the mental and social well-being, which manifested by the participation in various activities, and their desire to communicate, express their feelings, and relate to those around them; all those made them not to feel lonely anymore, which is a feeling quite pronounced at their age. To conclude, physical activity helps maintain mental tone and proper functioning of the organic systems, which ensure optimal body adaptation to physical strains and nervous tension.

Key words: exercise, depression, anxiety, older adults, psycho-emotional well-being

Introduction

Sedentary life is one of the main factors which lowers the quality of life and causes people to become ill, especially in developed countries (Dragan K, 2016).

Thus, several specialized studies have shown that physical activity appears to be protective against depressive and anxiety disorders (Carek, P.J., et al., 2011, Ströhle A., 2009), giving back self-confidence in their own strength and a feeling of independence to the elderly people living in nursing homes and care facilities, who are away from their families and friends.

Ageing should be seen as a physiological process, which causes changes in the human body's apparatus and systems (cardiovascular, respiratory, locomotor, digestive, nervous system), decreasing the individual's endurance and implicitly their withdrawal from socio-professional life creating a feeling of dependence, uselessness and isolation (Bogdan, C., 2002).

An active elderly person does not age intellectually, physically or socially and has no time to think about old age (Dumitru, M., 1984).

Exercise activates blood circulation which leads to more intense irrigation of all organs and body, especially of the brain (Cristea, E., 1990) thus preventing mental status deterioration caused by the ageing process.

Depressive symptoms in the elderly are quite common and affect their physical and mental health and therefore their quality of life (Kok, RM, Reynolds, CF, 2017). Together with medication and psychotherapy sessions, physical activity plays an important role in improving and preventing depressive symptoms, especially in institutionalised elderly people.

Scientific studies have shown that physical exercise has beneficial effects in reducing anxiety, stress and depression, contributing to a better quality of life for elderly people in nursing home institutions and social welfare homes (Lok N, Lok S, Canbaz M., 2017).

Over time, aerobic exercise has been found to significantly reduce depressive symptoms (Paluska SA, Schwenk, T.L., 2000) and to prevent them from setting in. Moreover, exercise has been proven to be a protective

factor from mental and physical decline that comes with advancing age, thus contributing to physical, cognitive and psycho- emotional well-being, and even preventing depressive symptoms (Blanchet S., et al, 2018, Nuzum H, et al, 2020, Karssemeijer EGA et al, 2017).

One of the effects of sustained aerobic training is the induction of a good mental state manifested in various ways (feeling good, reduced depressive or anxious states, increased intellectual capacity, sleep regulation, increased concentration, increased availability for various activities, etc.). After a few weekly gym classes or aerobic exercises over a longer period were introduced, a significant improvement was found in cognitive performances and an especially high attention span in the elderly persons having carried them out (Sbenghe, T., 1999).

Exercise can serve as a tool to cultivate a healthy lifestyle for institutionalized seniors who are in the midst of mental, social, emotional and physical changes (Parra DC, Wetherell JL, 2019). Consequently, older adults need encouragement and incentives to participate in activities involving physical exercises (McPhee J.S., 2016) in the form of group sessions, thus enabling them access to socialize and removing, at the same time, the feelings of loneliness, sadness, anxiety etc.

Material & methods

The purpose of this study was to highlight the benefits physical activity brings on the institutionalized elderly's mental state, thus contributing to prevention and improvement of depressive symptoms in this category of subjects.

Thus, the starting hypothesis was that if physical exercise programs are implemented, tailored to the older person's body needs, the result will be that, apart from good functioning of all the human body's systems, their mental state will be obviously more relaxed, no longer feeling sad, useless, lonely and isolated, feelings that are present in this age category, more or less.

The research included a number of 40 institutionalized subjects, aged between 64 and 72 years old, divided into two groups: the experimental sample (n=20), for which physical activity programs were implemented, and the control sample (n=20), who carried out their daily regular routine, refusing to participate in the programs carried out within the nursing home.

The research model was mixed, intra- and inter-subject, within the meaning that it monitored the subject's evolution in the experimental group over the course of 6 months, as well as how was their evolution different from the subjects in the control group with regard to resolving the ageing effect.

In order to assess the effects of physical activity mental-wise, the Profile of Emotional Distress was used; it is a self-report measure of dysfunctional emotions and negative functional emotions in the categories of fear and sadness/depression and it uses the construction principle of the profile of mood states, shortened version (DiLorenzo, T.A. et al, 1999), based on Albert Ellis (1994)'s theory on emotional distress. This scale allows for calculation for a general distress score, and also separate scores for "functional fear", "dysfunctional fear", "functional sadness/depression" and "dysfunctional sadness/depression".

The following objectives were aimed at by the exercise programs:

- Improve the quality of sleep
- Reduce the emotional stress level caused by the absence of loved ones
- Create a good mood state and stimulate self-confidence
- Fight against feelings of uselessness and isolation and, implicitly, depressive symptoms and anxiety states;
- Stimulate the socialization process
- Maintain high-level physical and mental energy in the body.

Methods and means used. A series of six kinetic programs was designed, by different difficulty levels, intended to achieve the above-mentioned objectives. Each difficulty level or accessibility contained one medical gymnastics program (exercises to selectively influence the locomotor system, with or without objects, using their own body weight, balance exercises, coordination exercises, breathing exercises) and one cardio training program (3 models adapted by the multi-layer testing protocol on the stationary bicycle - American College of Sports Medicine and by a protocol of treadmill walking (National Heart, Lung, and Blood Institute and the American Heart Association). The principle of effort's gradual increase and dosage was complied with for all physical activities, permanently monitoring blood pressure and pulse measurements; each exercise session lasted for 40 minutes for the medical gymnastics' programs and approximately 20-30 minutes for the cardio training programs, and breaks were relatively equal to the effort's duration. It should be noted that the cardio training programs reported 75% output of VO₂ maximum, further to the initial specific tests on the effort capacity of the elderly persons.

Subjects included in the trial participated daily in the exercise programs proposed within the nursing home, alternating segmental physical exercises with exercises on fitness equipment, relying on the idea according to which movement is the key element to actively promote health, being directly linked to longevity.

Results

In the initial test, **the Profile of Emotional Distress** values ranged between 41 and 54 points, the subjects being restless, insecure and concerned about their action possibilities in everyday life, sometimes melancholic, worried and alone, and the feeling of uselessness, powerlessness and mistrust in own strength was more and more pronounced.

Analysis of the parameters of interest was done separately for the two experimental moments (initial test-final test) and for the two groups (the experimental group and the control group), using procedures specific to the descriptive statistics (calculation of basic statistical indicators, frequency tables, graphical representations).

With regard to the control group, three cases reported a mild improvement in their psycho-emotional well-being, the average score recorded dropping from 46,30 to 46,15; the before-after difference was not, however, statistically significant, a fact shown by the paired samples Wilcoxon test ($z = -1,732, p = 0,083$).

The table of ranks for the variable researched is presented below.

Table 1. Table of ranks. Emotional distress

Control group		N	Rank mean	Rank sum
Emotional distress final - initial	Negative ranks	3(a)	2,00	6,00
	Positive ranks	0(b)	0,00	0,00
	Equal ranks	17(c)		
	Total	20		

- a. profile of emotional distress- final test < profile of emotional distress - initial test
- b. profile of emotional distress- final test > profile of emotional distress - initial test
- c. profile of emotional distress - final test = profile of emotional distress - initial test

Table 2. Wilcoxon signed rank test- test statistics

Control group	Emotional distress final-initial
Z	-1,732(a)
P (two-tailed test)	0,083

(a) calculated based on positive ranks

With regard to the experimental group, PED score in the initial test phase was 44,50, significantly higher than the PED score in the final test (27,45). All subjects reported a drop in the score to the *Profile of emotional distress* test, fact which is an indication of psycho-emotional well-being.

The before- after difference is statistically significant at a threshold of 0,01, fact shown by using the paired samples Wilcoxon test ($z = -3,933, p < 0,001$). The table of ranks for the variable researched is presented below.

Table 3. Table of ranks. Emotional distress

Experimental group		N	Rank mean	Rank sum
Emotional distress final - initial	Negative ranks	20(a)	10,50	210,00
	Positive ranks	0(b)	0,00	0,00
	Equal ranks	0(c)		
	Total	20		

- a. profile of emotional distress - final test < profile of emotional distress - initial test
- b. profile of emotional distress - final test > profile of emotional distress - initial test
- c. profile of emotional distress - final test = profile of emotional distress - initial test

Table 4. Wilcoxon signed rank test- test statistics

Experimental group	Emotional distress- final-initial
Z	-3,933(a)
P (two-tailed test)	0,000

(a) Calculated based on negative ranks

Score evolution on the *Scale of emotional distress* on the two experimental stages can be noticed in the *Boxplot-like chart* shown below.

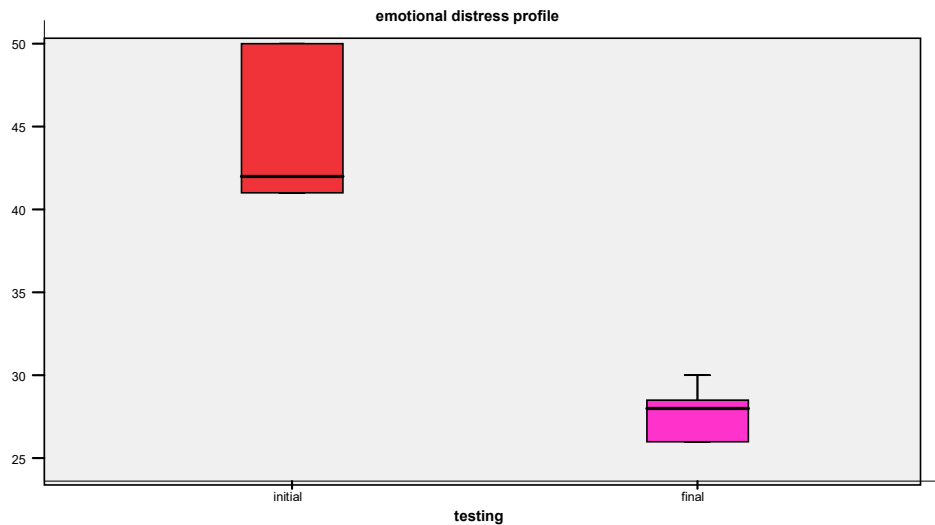


Figure 1 Initial- final emotional distress (experimental sample)

Difference between the experimental and the control samples

There was no statistically significant difference between the experimental group and the control group with regard to the psycho-emotional well-being in the initial test phase. This group homogeneity was, actually, a prerequisite for the experiment’s carry out.

However, the statistical difference between the two groups in the final test phase was a major one, being statistically significant at a threshold of 0,01 – fact shown by using the Mann- Whitney U test for two independent samples (nonparametric test).

The scores mean reported by the experimental group was 27,45 and 46,15 by the control group. The difference between the two groups is statistically different ($z = -5,459, p < 0,001$).

The tables of the Mann- Whitney U test for the variable researched are shown below.

Table 5 Table of ranks. Final emotional distress

	Group of subjects	N	Rank mean	Rank sum
Emotional distress- final test	Control group	20	30,50	610,00
	Experimental group	20	10,50	210,00
	Total	40		

Table 6- Table of test statistics– Final emotional distress

	Nutritional status- final
Mann-Whitney U test	0,000
Z	-5,459
P (two-tailed test)	0,000

The difference between the two groups in the final test phase with regard to the psycho-emotional well-being can be noticed in the *Boxplot-like* chart presented below.

Profile of emotional distress - final test

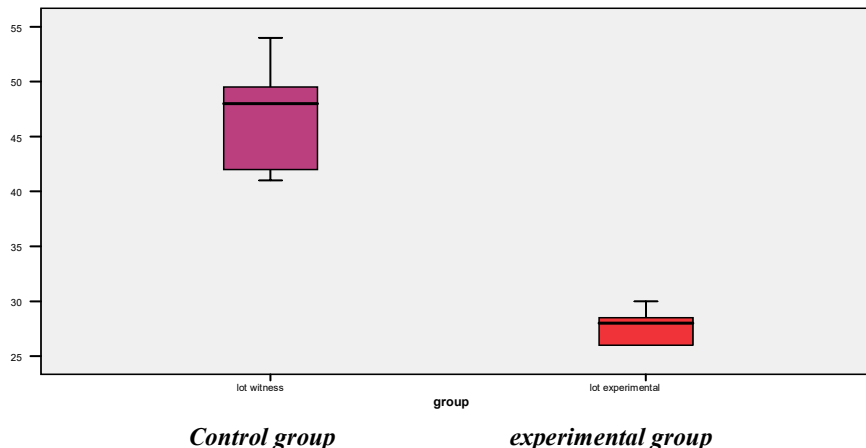


Figure 2 Final emotional distress (control sample- experimental sample)

To conclude, analysis of the statistical interpretations reveals that only three cases from the control group reported a mild improvement of their psycho-emotional well-being, the before-after difference being non-statistically significant (Wilcoxon test $z = -1,732$, $p = 0,083$). All subjects in the experimental group reported an improvement in their psycho-emotional well-being, the mean score in the final phase being 27,45, as compared to 44,50 in the initial phase. There is a statistically significant difference between the two groups (Mann-Whitney U test for two independent samples (nonparametric test); $z = -5,459$, $p < 0,001$);

Discussion

Over time, researchers in the field have always been preoccupied with how physical exercise influences the elderly people's psycho-emotional well-being. Thus, after having carried out a number of studies, a series of authors believe that physical activity is a protective factor against anxiety and depression (De Oliveira LDSSCB et al, 2019) which tend to set in once people age. Also, memory performance improvement is directly proportionate to the fitness level increase (Kovacevic A. et al, 2019), which also has beneficial effects on the psycho-emotional and affective well-being of older people.

Physical activity is a key element to aging healthy, preventing falls, sarcopenia, osteoporosis and cognitive disorders setting in and, why not, emotional disorders. In this context, it can be said that people who are active until old age can go through the inherent aging process without being significantly affected by the changes occurring at this age (Harridge, SD, Lazarus, N.R., 2016, Eckstrom E, et al, 2020).

The physical exercises range recommended for this age aim at the aerobic exercise, balance exercises, stretching exercises adapted to the individual traits of each older adult, carefully chosen from a volume point of view, intensity and duration, as such that optimal outcome is achieved (Galloza J, Castillo B, Micheo W., 2017) both physically, and mentally.

Specialized guidelines recommend either 150 minutes of moderate-intensity, or 75 minutes of vigorous intensity physical activity and at least 2 days of muscle -strengthening activities (Lee PG, Jackson EA, Richardson CR., 2017, Elsayy B, Higgins KE., 2010), all this being only possible after an evaluation of each individual's movement capacity separately.

Physical activity is the necessary medicine in order to increase the quality of life and maintain independence in the elderly population (Bray NW et al, 2016), a fact which gives them more self-confidence and zest for life, making psycho-emotional disorders to be lower and preventing the anxiety and depressive symptoms.

In relation to the existing studies on the connection between psycho-emotional well-being and exercise in the elderly people, this research adds-on to the idea according to which benefits from exercising in an organized manner are utterly needed to this category of institutionalized people, in order to lower psycho-emotional and affective symptoms.

Thus, this study shows that when exercise programs are applied to the elderly people in the experimental group, the score mean on the *Profile of emotional distress* scale was 27,45 (standard deviation: 1,46), which is a clear indication of a very good psycho-emotional well-being, without any emotional disorders. Scores ranged between 26 and 30, indicative of subjects whose psycho-emotional well-being is optimal, and the elderly people in the control group, who carried out only their daily activities, the score mean on the *Profile of emotional distress* scale was 46,15 (standard deviation: 4,32), a fact which indicates a good psycho-emotional well-being. Scores ranged between 41 and 54 (the amplitude being low, of only 13 points), which is indicative of the sample's homogeneity. All subjects researched had a low level of emotional distress.

Conclusions

Research results suggest that a physical activity structured program has a positive impact on depressive symptoms and quality of life for older persons.

Physical activity helps maintain mental tone and all organic systems function properly, which ensures optimal body adaptation to physical strains and nervous tension.

Review of the previously mentioned matters reveals the emergence of the idea according to which carry out, on a regular basis and in an organized manner, of a program of exercises promotes the maintaining of a psychological good mood overall and provides opportunities for an active social life.

This research demonstrates that the carry out of physical activity emotional tone is kept and good functionality is achieved, which ensures body adaptation to new situations.

Subjects in the experimental sample recorded significant improvements, in terms of psycho-emotional and affective well-being, as they were a lot more communicative, sociable, open to participate in other new activities in the nursing home, unlike the subjects from the control group, who said, in the final test, that they felt more anxious, sad, abandoned, useless, a burden to society.

Thus, a moderate physical activity program contributes to mental health's safeguarding (Awick EA, Ehlers DK, et al, 2017), preventing the onset of depression and anxiety, encompassing a blend of negative psycho-emotional moods, affecting the quality of life of the institutionalised elderly people.

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