

# The importance of kinesiotherapy group practice on the quality of life of the elderly

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## ABSTRACT

**Objective:** Analyze the effect of group kinesiotherapy on quality of life, adherence and discontinuation of the program, functional ability, balance and gait of sedentary elderly women. **Method:** Experimental study, with a sample of elderly women over the age of 60 years (N=30). They were submitted to a kinesiotherapy protocol for twelve weeks after being randomized into three groups: collective kinesiotherapy (CK), individual kinesiotherapy (IK), and control group (CG). Quality of life with SF-36 survey, and the variables of balance and gait with Tinetti test were assessed. Descriptive statistical procedures and the Wilcoxon test were applied to evaluate the effect intra group and the Kruskal-wallis test for analyzing the variance between groups, with significance of  $p < 0.05$ . **Results:** Adherence were: CK, n=10; IK, n=10; and CG, n=10. Tinetti test (before x after): CK total score, 9.26 X 13.1; IK total score, 11.37X14.5. There was not improvement in CG. SF-36 (mean scores, before x afer): CK Pain, 33.2 X 70.7; CK Emotional wellbeing 33.3X66.6; IK Functional capacity: 64X 85.5; IK Emotional aspects: 77.7 X 88; IK Functional limitation: 72.5X 100. There were no statistically significant changes in CG. **Conclusion:** We found no expressive differences regarding the kinesiotherapy program discontinuation between the intervention groups. However, both groups presented significant differences after the interventions in improvement of the emotional aspects, improvement of physical impairments, pain reduction, improvement of balance and gait, what evidences the efficacy and the relevance of this activity.

**Keywords:** Aging, Exercise, Health, Quality of Life

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## INTRODUCTION

Currently, we are facing a rapidly aging population and it is estimated that the number of people with above 65 years of age is projected to grow from 524 million in 2010 to about 1.5 billion in 2050, with most of this increase in developing countries.<sup>1</sup> This increase in the elderly population is due to a change in the main causes of illness and death, which the past years infectious and parasitic diseases prevailed and affected, more frequently, the lives of infants and children. Nowadays, we face an epidemiological change, with a higher prevalence of chronic diseases, especially in the elderly.<sup>2,3</sup>

Among the main health problems in the elderly population, there is a great reduction in functionality,<sup>4</sup> and multiple impairments, either related to the aging process itself (such as osteoarthritis), chronic diseases that could have been avoided (such as hypertension, diabetes, cerebrovascular accident), or degenerative diseases (such as dementia);<sup>5</sup> in this context, health in the elderly is no longer evaluated simply by the number of diseases, but by the degree of preservation of functional capacity.<sup>4,6</sup>

Physiotherapy has the resource of kinesiotherapy, which is an exercise program that focus at functionality for improving physical conditioning, postural alignment, disability reduction, relaxation, pain relief, and quality of life. Once its principle is the therapy through movement, the practice of kinesiotherapy is a promising resource to minimize the functional decline attributed to the senescence process so evident in the last decades, and a methodology of physical training that can be performed individually or collectively.<sup>8</sup>

It is already well documented in the literature that physical exercise practices can bring innumerable benefits to the elderly population.<sup>9</sup> However, few studies have related the effects of these practices with effective concepts in the permanence of health prevention programs. This age group has peculiarities in relation to the type of training, and can be discouraged when the exercise dynamics do not challenge them, or even quit if the type of exercise goes beyond their functional capacity.<sup>10,11</sup> Given this evidence, the present study uses the kinesiotherapy to face the typical problem of lack of interest and adherence to the routine of exercises, aiming to use this method of Physiotherapy based on rehabilitation exercises that prioritize the functionality, allowing users to perform exercises in a pleasant way and therefore providing opportunity for effective functional recovery.

## OBJECTIVE

To analyze the effect of group kinesiotherapy on quality of life, adherence and withdrawal of the program, functional capacity, balance, and gait of sedentary elderly women.

## METHODS

This is a quantitative prospective randomized study. The study had two experimental groups and a reference group (control), and all groups were evaluated before and after the intervention, for the analyses of the effects of kinesiotherapy (cause) and implications on functional variables (effect) in a given period. The sample was constituted of elderly women with mean age of 69.83 ( $\pm 7.76$ ) from a specific neighborhood in the city of Caruaru, Brazil.

To calculate the sample size, the following parameters were adopted: 95% confidence interval, maximum tolerable error of 2 percentage points, design effect (deff=2), and, given it was a study covering the analysis of health perception and functional physical capacity with different frequency of occurrence, the estimated prevalence was defined as 50%. In addition, in order to mitigate the limitations imposed by possible losses in the application and/or inadequate filling of the questionnaires, it was decided to increase the sample size by 20%, what totaled 48 individuals.

Data collection was performed through a structured interview and convenience method, from April to June 2016. Subjects at the age group of 60 years or older who did not present cognitive deficit were included and were excluded people if they had diseases that made it impossible to practice physical activity.

The sessions and interviews were held in a meeting room of a Senior Citizens' Association, where the interviewees were taken to a reserved place in order to avoid embarrassment. The intervention protocol was performed once a week for 12 consecutive weeks.

The study was approved by the Ethics Review Board of the ASCES Faculty (CAAE-35079914.2.0000.5203/CEP-ASCES: 813.210/2016) and the patients were included voluntarily and anonymously.

The SF-36 instrument (The Medical Outcomes Study 36-item short-form health survey), translated, adapted, and validated in Brazil,<sup>12</sup> was used to evaluate the quality of life

of the elderly. The SF-36 is a multidimensional questionnaire composed of 36 items divided into eight domains that are grouped within two major components: physical (physical functioning, role limitations due to physical health, pain, and general health) and mental (role limitations due to emotional problems, energy/fatigue, emotional wellbeing, and social functioning).<sup>13</sup>

The gait and balance analysis were performed with the Tinetti Test, which is composed of 16 items, in which 9 are for body balance and 7 for gait. The Tinetti Test classifies aspects of gait as speed, stride distance, symmetry and standing balance, the turning of the body and also posture changes with eyes closed. The score for each exercise ranges from 0 to 1 or 0 to 2, and lower scores indicate poorer physical ability. The total score is the sum of the body balance score and the gait score. The maximum score is 12 points for walking, 16 for body balance, totaling 28.

Regarding functionality, it was assessed with functional domain scores of the SF-36 questionnaire.

## TREATMENT PROTOCOL

The treatment protocol for both kinesiotherapy groups were: one sixty-minute therapy session weekly, for 12 weeks.

### Group therapy (G: n=9)

5-minute walk; quadriceps strengthening with shin weight, sit-ups; integrated circuit of obstacle walking, combined with hauling of objects off the ground, strengthening of upper limbs with kabat diagonals and elastic resistance; strengthening of biceps and triceps brachii with elastic resistance; lateral walking, sural triceps strengthening in orthostatic posture; balance training with (proprioceptive board, unipodal support combined with obstacle deviation in the contralateral limb; walking on a straight line); stretching of pectorals; hamstrings, internal and external rotators of shoulder with support of a stick, dissociation of waists, relaxation with calisthenics exercises.

### Individualized therapy (GI: n=10)

5-minute walk; quadriceps strengthening with shin weight, sit-ups; integrated circuit of obstacle walking, combined with hauling of objects off the ground, strengthening of upper limbs with kabat diagonals and elastic resistance; strengthening of biceps

and triceps brachii with elastic resistance; lateral walking, sural triceps strengthening in orthostatic posture; balance training with (proprioceptive board, unipodal support combined with obstacle deviation in the contralateral limb; walking on a straight line); stretching of pectorals; hamstrings, internal and external rotators of shoulder with support of a stick, dissociation of waists, relaxation with calisthenics exercises.

### Control group (C: n=8)

This group did not receive any type of intervention. At the end of the research, however, these individuals received three months of kinesiotherapy exercises equally to the experimental groups, for ethical reasons.

Data analysis was conducted with the BIOSTAT 5.0 program, firstly for descriptive statistics (mean, standard deviation and frequency distribution). As it was observed that the data did not meet normality, the analysis of the variables was carried out with the non-parametric association test, Wilcoxon test for paired data, with significance level of  $p < 0.05$ .

## RESULTS

The Figure 1 presents the subjects that were included in the study and that quit the kinesiotherapy program, divided in three groups.

In the Table 1, the data from the Tinetti Test are presented, whereas the Table 2 presents the results concerning the SF-36 quality of life questionnaire (The Medical Outcomes Study 36-Item Short-Form Health Survey).

## DISCUSSION

By analyzing the Figure 1, it is possible to observe that there was more adherence in the group in which the intervention was performed individually, however there were no significant differences in relation to the adherence of the group that received collective care.

Similarly, previous studies<sup>10,11,14</sup> evidenced that the main reasons for the adherence and permanence of the elderly in exercise programs are "friend indication", "improvement of health", "improvement physical and mental health" and the "relationship".

However, no study to date has tried to analyze the interference of individualized or group therapies methodologies, since this population lacks services that prioritize a global and individualized view according to their functional capacity, a fact that group

therapy can also lead to disadvantages, since this training methodology provides a generalized view of the group, as opposed to the individualized one that provides the therapist with specific attention concerning the functional particularities of each patient.

Hence, this practice, in addition to providing greater gains regarding functional capacity, what was evidenced in our results (Table 2) and in the and in previous studies<sup>15,16</sup> that focused in analyzing the effects of interventions with exercises for facilitating activities of daily life. However, the dynamics of exercises performed individually does not provide social stimuli, which can significantly interfere in the discontinuation of the program in the long term.

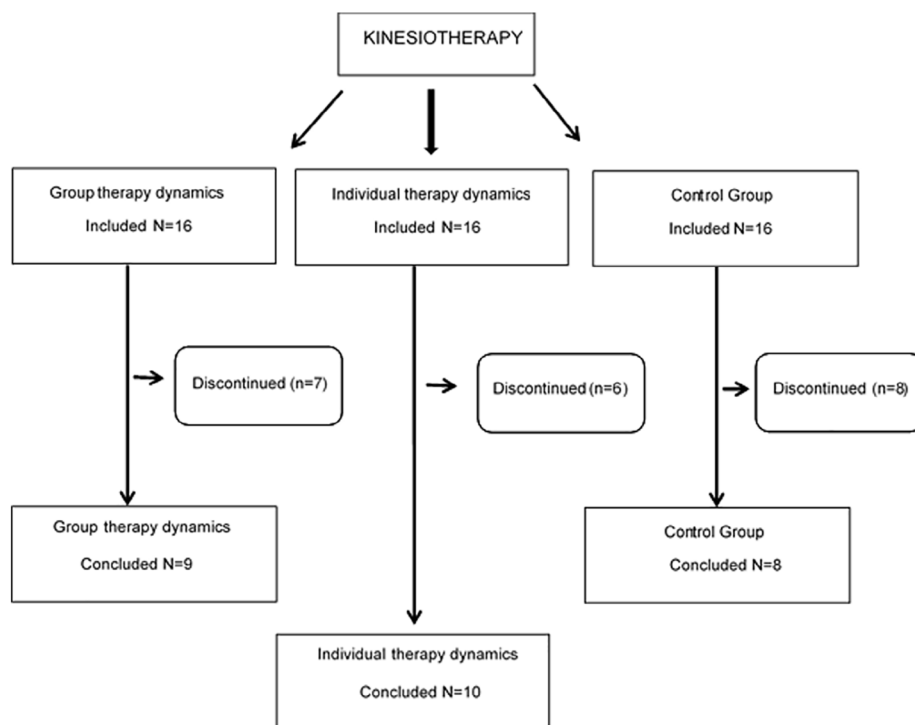
In the study of Pimentel,<sup>17</sup> sedentary elderly were compared to active elderly who practiced walking, strength training and stretching for 50 min 2 times a week for 6 months. A significant improvement in balance was observed in their results, matching the present study that showed a significant improvement of the same variables in both groups of exercises. However, the authors did not evaluate the effects on gait of the elderly, a factor that deserves attention, since gait alterations may have an impact on the greater

risk of falls in the elderly, regardless of the balance that may or may not be associated.

With the normal aging process, the elderly tend to decrease gait speed and stride length, increase the support base and double-support time as a strategy to gain stability.<sup>14,18,19</sup> This adaptive mechanism of aging may be associated with a decline in overall muscle strength, with a higher preference for lower limbs.<sup>20,21</sup>

Although these changes are normal with the senescence process, several studies<sup>22-26</sup> suggest that such alterations can be delayed by the practice of physical exercise. However, none of these studies addressed the influence of gait training and integrated circuits involving reality-oriented gait components, such as obstacle deviations and movements with instabilities.

Given that gait does not depend only on muscular strength but rather on complex movements involving a multifactorial set of interactions between the process of neural and mechanical systems organization, including the musculoskeletal dynamics, the genetically determined spinal circuit (central pattern), modulation by the higher nervous centers and afferent stimuli need to be continually reprogramming movements according to the needs imposed on a daily basis.<sup>22</sup>



**Figure 1.** Randomization with the software Research Randomizer®, result of patients who concluded the program.

**Table 1.** TINETTI test results

	KINESIOTHERAPY		
	Group therapy protocol	Individual therapy protocol	Control Group
	BEFORE X AFTER	BEFORE X AFTER	BEFORE X AFTER
Balance score	10.2(±5.14) x 15.8 (±3.92) *	14(±5.34) x 17.6(±4.64) *	7.22(±2.22) X 7.33 (2.24)
Gait score	7.40(±1.99) x 10.7 (±3.86) *	9(±2.31) x 11.7(±4.42) *	5.30(±2.31) X 5.20 (±1.69)
Total score	9.26(±4.31) x 13.1 (±4.62) *	11.37(±4.68) x 14.5(±5.36) *	6.21(2.42) X 6.21(±2.20)

\*  $P < 0.05$  in the Wilcoxon test. Variables results are presented as mean score (standard deviation).

**Table 2.** Domains of the quality of life questionnaire SF-36

	Group therapy protocol	Individual therapy protocol	Control Group
	BEFORE X AFTER	BEFORE X AFTER	BEFORE X AFTER
Physical functioning	53.3 (± 17.1) X 61.6 (±28.2)	64 (±25.7) X 85.5 (±12.4) *	38.7 (±22.9) X 33.1 (±12.7)
Pain	33.2(±27.1) X 70.7 (±34.1) *	60.7(±30.7) X 75.8 (±23.9)	53.8(22.7) X 56.6(13.4)
General health	46±22.3) X 57.5 (±19.1)	61.5(±22.6) X 61.6 (±16.3)	45.5(±13.1) X 40.1(±18.8)
Social Functioning	75(±30.6) X 56.2 (±37.5)	95(±11.1) X 100(0)	65(±28.5) X 87.5(±20.9)
Emotional problems	33.3(±37.2) X 66.6 (±40.7) *	77.7(±28.8) x 88.8 (±23.5) *	37.4(±37.4) X 45.7(±50.1)
Physical limitations	50 (±37.5) X 69.4 (±46.3)	72.5(±37) X 100 (dp:0) *	37.4(±37.4) X 45.7(±50.1)
Energy/fatigue	52.7 (±20.6) X 58.3 (±20.1)	75.5 (±19.1) X 77.7 (±20.3)	53.1 (±21.7) X 53.1 (±16.8)
Mental health	21 (±4.7) X 23.3 (±4.3)	24.4 (±5.4) X 26.1 (±3.3)	20.3 (±4.1) X 22.1 (±6.0)

\*  $P < 0.05$  in the Wilcoxon test. Variables results are presented as mean score (standard deviation).

Therefore, it is known that the elderly begin to decline in some of these systems, it is of great importance to develop treatment protocols that provide integrated stimuli. From the same view point, studies<sup>17,22</sup> have evidenced gait improvements in a longer intervention compared to ours, making it clear that these gait disorders must be trained and brought to reality, in addition to muscle strength training specifically for this purpose.

Regarding quality of life and exercise dynamics related issues, it can be seen in Table 2 that the group that had individualized care obtained greater functional gains when compared to the collective care or the control group, showing that this type of program focusses uniquely in the physical capacity of each individual, allowing the therapist to work the main difficulties and facilities of the elderly, and to monitor the intensity of the exercise, for facilitating the best performance. Oppositely to what was seen in the collective training group, since this type of behavior does not allow the focus on a single individual, but rather on the functional average of the intervention group, hindering some individuals to improve.<sup>15,27</sup>

Although the dynamics of individual exercises have indicated a better result in terms of functional capacity and limitations, we cannot forget that the practice of group exercises is a promoter of socialization.<sup>28</sup> Studies emphasize the importance of group

activities as a contributing factor for the promotion of well-being of the elderly.<sup>29,30</sup> In contrast, if there is the isolation of the elderly, there is a greater susceptibility to illness.<sup>31,32,33</sup>

Group physical exercise programs allow a greater number of social interactions; when practiced regularly, it can provide behavioral change, triggering emotional (experienced by functional gains) and psychological transformations (highlighted by the socialization effect), given that when the elderly feels praised, they can demonstrate positive changes with his family and the social environment, directly influencing the psychological health of the elderly.<sup>34,35</sup>

Among these benefits, the literature shows a clear correlation between reduction of pain and physical exercise, justified by the greater production of endorphins in the body as a response to exercise, what produces a state of euphoria and pain reduction.<sup>36</sup> This effect is found in one of the intervention groups, oppositely, there was no improvement in pain in the group that exercised individually.

This finding may be the result of collective intervention, because it is a more pleasurable to practice collectively, what results in greater well-being, however, more studies are needed to analyze the comparison between the practice of individualized and collective kinesiotherapy, in order to know what the effects are, and for which type of elderly it has a better indication.

## CONCLUSION

Kinesiotherapy leads to improvements in gait, balance, functional capacity, pain and emotional aspects of the elderly. It can be a suitable alternative for the improvement of functionality in activities of daily living, favoring a higher quality of life, since it can be an effective method to promote a geriatric revitalization, by applying pleasurable and effective techniques. Despite the beneficial effects of kinesiotherapy with the elderly, it is necessary to evaluate the context of the patient needs, before judging which methodology is superior, either individual or group therapy.

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