# Effects of a psychomotor intervention on psychomotor profile in institutionalized elderly with mild dependency

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ABSTRACT

Institutionalized elders tend to have a higher dependency on the performance of basic and instrumental activities of daily living, as well as a higher percentage of cognitive deficit and poorer psychomotor performance. This short paper intends to analyze the impact of a psychomotor intervention in psychomotor profile and three specific components – motor prevalence, cognitive prevalence, and physical constraints, assessed by the Examen Géronto-Psychomoteur (EGP) adapted for Portuguese population. The sample consisted of nine elders (M = 77.44yrs; SD = 8.99) institutionalized in a nursing home residence, all with mild dependency and cognitive deficit. The intervention was conducted for 30 group sessions. Each session was structured in five moments: reality orientation activity, warm-up, core activity, cool-down and finishing ritual. Data analysis was performed with descriptive analysis and Wilcoxon statistical test. The results from data comparison in pre- and post-intervention showed significant improvements in the psychomotor profile and in the cognitive prevalence component. It was also checked the differences in each elder person for the studied variables. This study aimed to enhance the understanding of the importance of psychomotor intervention in geriatric care, particularly when integrated within a multidisciplinary rehabilitation team.

KEYWORDS

psychomotricity, aging, dependency, cognitive impairment, institutionalization

## Introduction

The increase in average life expectancy is associated with an increment of deficits and pathologies derived from the aging process, which can negatively influence the lives of older people (Espadinha, Branquinho & Morais, 2021). In Portugal, recent data from 2021 revealed that the elderly is increasing and corresponds approximately to a 25 % of the population (Observador, 2021).

According to this reality, we have the responsibility to improve our knowledge and professional practices to face the new needs of this population and prepare the health professionals to act with a better understanding of the causes, processes, and consequences of aging and, in this case, psychomotor assessment and therapy.

First of all, it is essential to have the notion that aging is a heterogeneous and an individual process, because it depends on so many factors, such as genetics, educational and social factors, medical history, professional history, and many other factors (Lefèvre, 2023; Espadinha et al, 2021). In this sense, a case-study methodology could be beneficial for the understanding of individual differences in the impact of assessment and/or intervention in older adults.

On the other hand, in this study, we focused on psychomotor competences, that involve the interaction between the mind and human movement and are significantly influenced by the higher brain center's function, for example, the motor cortex (Morais, Santos & Lebre, 2017). Therefore, these competences are directly influenced by physical and mental aging. In general, studies have shown that balance and motor coordination can be affected by a reduction in muscular strength, augmentation of reaction time and presence

of difficulties in performing double task demands (Lefèvre, 2023). Nevertheless, in a healthy aging and at a cognitive level, older people usually maintain their cognitive abilities till late years (Lefèvre, 2023; Morais et al, 2017). The embodied self can also be affected, not only by aging, but also by changes in the social and family context and institutionalization (Personne, 2020). There are often stigmas and prejudices related to physical identity, giving a negative connotation, for example, to wrinkles, gray hair and also related to social identity, associating the elderly with uselessness and fragility.

Finally, it is fundamental to understand the effects of different conditions and pathologies, as well as the event of institutionalization, in psychomotor profile and performance in older adults. Studies have shown that quality of life has worst levels in institutionalized persons, often related with less opportunities do decide for themselves, less physical activity, and poorer cognitive stimulation (Medeiros et al, 2020). Dementia is probably the most frequent health issue present in institutions for older people. In a study made in Portugal, older people with dementia presented significant lower results, compared with older people without dementia, in static and dynamic balance, fine motricity (upper and lower limbs), praxis, knowledge of body parts, vigilance, perceptive memory, space and time domain, verbal memory and communication (Morais et al, 2017).

Thus arises the need to implement specific intervention programs, both in the preventive and therapeutic aspects, and to understand the effectiveness of these programs, namely the psychomotor intervention with elderly.

## Design of the study

The current study adopts a quasi-experimental design and includes elderly people residing in a nursing home located in the central region of Portugal. All measures were performed at baseline and after 30 sessions of intervention.

## Participants

Participants included 9 older adults (M = 77.44yrs; SD = 8.99) institutionalized in a nursing home residence with mild dependency. In what concerns the cognitive status, according to the MMSE scores for Portuguese population and level of education of the participants (Sequeira, 2018), we have four participants with cognitive deficit (MCP, MGP, MMS, MCR) and five participants without cognitive deficit (MAC, BG, MLF, LB, MMF). About the autonomy in basic activities of daily living, according to the Barthel Index, all the participants had a slight dependence in this parameter.

The following inclusion criteria were used: 65 years of age and older; living in a nursing home; com dependênciawith mild dependency; with physical condition to participate in the sessions (mas semestar acamado?capaz de ir às sessões?)

## Methods

The present study was approved by the Ethics Committee of the University of Évora. Informed consent was signed by all participants or by their legal guardian (in case of incapacity), after explaining the study. Once the institution had consented to participate in the study, participants who met the inclusion criteria were recruited.

Data collection was carried out in December 2021 (baseline assessment) and June 2022 (post-intervention assessment). Three instruments were used for the evaluation:

(1) Barthel Index: assessment of the subject‘s level of autonomy in carrying out for 10 different basic activities of daily living (Sequeira, 2018); the Barthel Index was filled by the social assistant from the institution. Each item is scored based on whether or not the individual can perform a task or activity independently, with assistance or if they are fully dependent. The scoring is as follows: 0 – unable, 1 – needs assistance/help, 2 – independent. The score changed between 0 and 100. The higher the score, the more independent the patient is. The scored change between total dependency and slight dependency.

(2) Mini Mental State Examination (MMSE): assessment of specific cognitive abilities in the elderly, taking into accountconsidering their level of education (Sequeira, 2018). The maximum score is 30 points and the higher the score the more MMSE performance.

(3) Portuguese Version of Examen Géronto-psychomoteur (EGP): consists of a qualitative and quantitative assessment instrument of psychomotor skills in the elderly. This includes 17 domains, including: static and dynamic balance; joint mobilization of the upper and lower limbs; fine motor skills of the upper and lower limbs; praxis; knowledge of body parts; vigilance; perceptive memory; spatial domain; verbal memory; perception; temporal domain and communication (Morais, Santos & Lebre, 2021). Through exploratory and confirmatory factor analysis, this instrument is divided into 3 components: motor prevalence (includes static and dynamic balance domains and fine motor lower limbs domain), cognitive prevalence (includes fine motor upper limbs, praxis, knowledge of body parts, vigilance, perceptive memory, space domain, verbal memory, perception, time domain and communication) and physical constraints (joint mobilizations of upper and lower limbs). With the EGP assessment we studied four variables: psychomotor profile (total score) and the three specific components.

The assessment was administered on an individual setting, ensuring a tranquil and secured environment. The assessment initiated with the administration of the MMSE by a qualified psychologist, which was followed by the EGP administered by a skilled psychomotor therapist. The entire assessment process lasted 90 minutes, including a scheduled break during the administration of the EGP test, as prescribed by the procedure.

### Data Analysis

Data analysis was performed with descriptive analysis (mean, standard deviation (SD) and Wilcoxon statistical test. SPSS Statistics version 24 (IBM) software was used to analyze the data. The level of significance was 5 % ($p < 0.05$).

Table 1 Psychomotor profile from participants (mean and SD)
*M – mean; SD – standard deviation; EGP – Portuguese Version of Examen Géronto-psychomoteur*

| | EGP | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | psychomotor profile | | motor prevalence | | cognitive prevalence | | physical constraints | |
| **Participant/ all sample** | Baseline | Post-intervention | Baseline | Post-intervention | Baseline | Post-intervention | Baseline | Post-intervention |
| MCP | 70 | 80 | 19 | 20,5 | 40 | 47,5 | 11 | 12 |
| MGP | 59,5 | 61,5 | 21,5 | 23 | 27 | 24,5 | 11 | 12 |
| MMS | 66,5 | 84 | 26 | 29 | 32,5 | 43 | 8 | 12 |
| MCR | 78,5 | 80,5 | 23 | 20,5 | 44,5 | 48 | 11 | 12 |
| MAC | 90,5 | 97,5 | 27 | 27 | 52,5 | 58,5 | 11 | 12 |
| BG | 82,5 | 88,5 | 24 | 27 | 47,5 | 49,5 | 11 | 12 |
| MLF | 82 | 90,5 | 25 | 18 | 49,5 | 55,5 | 7,5 | 12 |
| LB | 90 | 96,5 | 26 | 29 | 54 | 56,5 | 10 | 12 |
| MMF | 79 | 79,5 | 26 | 21,5 | 43 | 50,5 | 10 | 8 |
| **Total sample (mean; SD)** | **77,61 (10.46)** | **84.28 (10.93)** | **24,17 (2.45)** | **23,94 (3.88)** | **43,39 (8.49)** | **48,17 (9.57)** | **10,1 (1.30)** | **11,56 (1.25)** |

## Psychomotor Intervention

The intervention consisted in 30 group sessions (2-days/week; 45–60min). The participants were divided in 2 groups: one with 3 elements and one with 6 elements, according to their cognitive and functional state.
Each session was structured in five moments:

1. Reality orientation activity: consists of tasks involving references to information about time ("which day is it? month? year?), place/space (where are we?) and aspects of the person ("how are you feeling today? Do you have other activities?). It doesn't intend to be a questionnaire, but more like a group conversation.
2. Warm-up: involves movement to promote a muscular preparation, awareness of the breath and the body and all possibilities of body movement, introducing a psychomotor activity.
3. Core activity: the therapist proposes activities in accordance with the established goals for the session (ex. planning and execution of a certain action, dual task, balance exercises). All proposed activities presuppose the exploration of different strategies and the empowerment of the participants.
4. Cool-down: it is a moment to return to calm and to decrease high levels of motor and cognitive activity. In general, these activities are an adaptation of relaxation techniques.
5. Finishing ritual: consist in a final moment to share experiences and expectations for the next session.

## Results

Table 1 display the statics descriptive (mean and SD) for each participant and for all sample, for the following variables: psychomotor profile (EGP total), motor prevalence, cognitive prevalence, and physical constraints. The results from data comparison in baseline and post-intervention for the sample showed significant improvements in the psychomotor profile ($M = 84.28, SD = 10.93$ vs ($M = 77.61, SD = 10.46, p < .008$) and in the cognitive prevalence component ($M = 43.39$, $SD = 8{,}50$ vs $M = 48.17$, $SD = 9.57$, $p < .018$). Differences in each participant for the four variables, it was also checked (see figures 1, 2 and 3) (psychomotor profile, motor prevalence, cognitive prevalence, and physical constraints).

## Psychomotor Profile

As it is possible to observe in figure 1, all the participants increased their results for the total EGP, except the subject MMF that maintained the same value.

## Motor Prevalence

Participants MCR, MLF and MMF had lower final results for EGP's motor component (see figure 2). It should be referred that participants MCR and MLF reported a fall near the final of the intervention, that affected their mobility during this period of time.

## Cognitive Prevalence

As it is possible to perceive in figure 3, all participants had better final results for this component, except subject MGP. This participant had a dementia diagnosis, and it was reported by the multidisciplinary team that it was observed a significative deterioration of the cognitive state when her husband got ill (this event happened during the psychomotor intervention). Participants with cognitive deficit (MCP, MGP, MMS, MCR) have lower scores in this component than the other participants.

**Psychomotor Profile:**

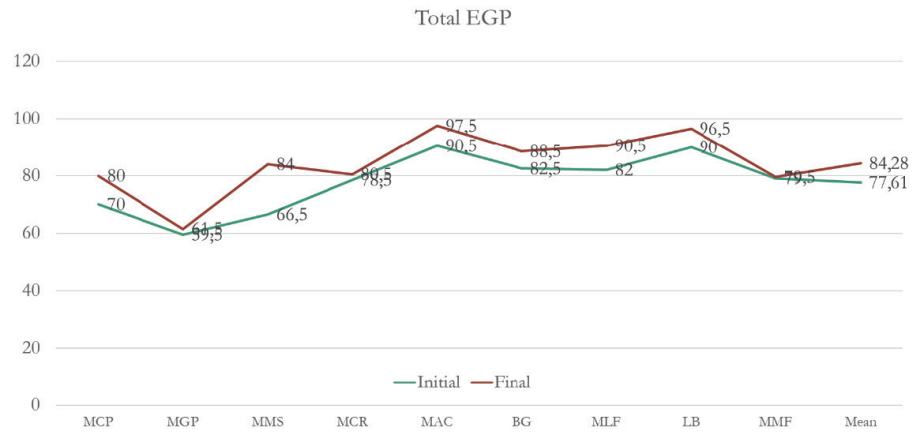


Figure 1 Results of initial and final assessment of the EGP's total punctuation, for each participant.

**Motor Prevalence:**

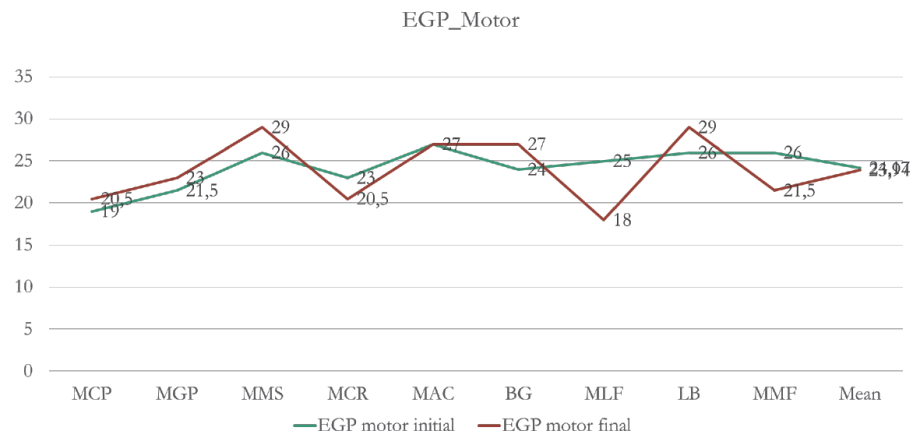


Figure 2 Results of initial and final assessment of the EGP's motor component, for each participant.

**Cognitive Prevalence**

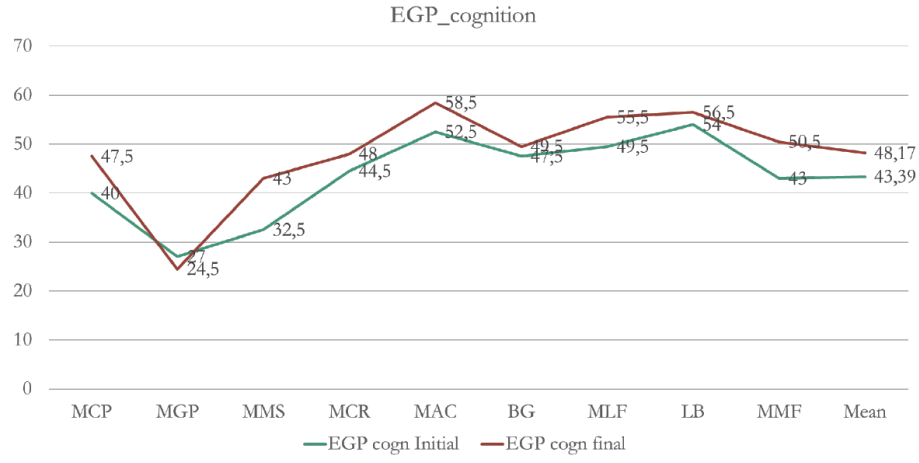


Figure 3 Results of initial and final assessment of the EGP's cognitive component, for each participant.

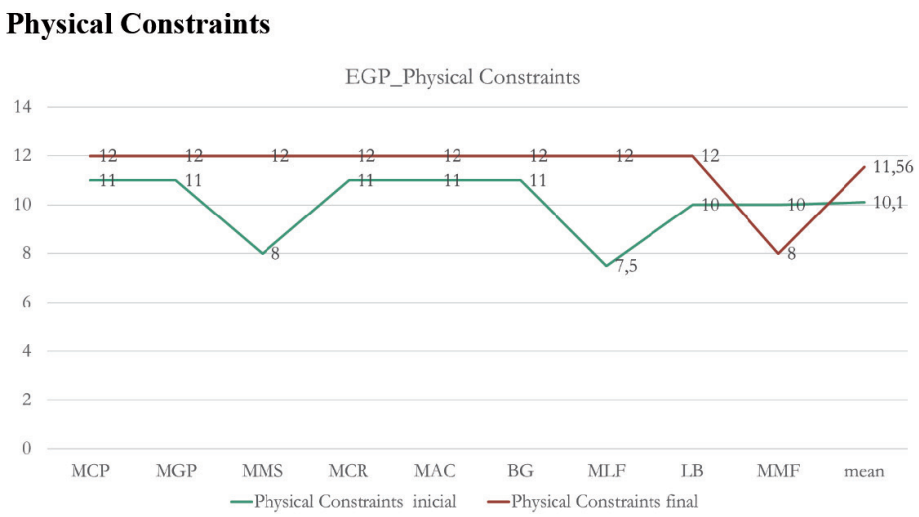


Figure 4 Results of initial and final assessment of the EGP's physical constraints component, for each participant.

### Physical Constraints

All participants increased their final scores, except MMF. This subject had a breast cancer diagnosis and had a worsening of this pathology during the psychomotor intervention, with presence of pain in different parts of the body (reported by the patient).

## Discussion and conclusions

Psychomotor therapy promotes a reconstruction of the schema and body image, a strengthening of maintained capacities, giving a positive meaning to the body experience (Marceau-Barquin, 2022). With regard to the elderly, this type of intervention is relevant and, in specific cases, even urgent.

In this study, participants with cognitive deficit have lower scores in the EGP's cognitive prevalence component, as expected. The subject with dementia diagnosis (MGP) had the lowest score in psychomotor profile, in the initial and final assessment. This is in accordance with the study of Morais et al. (2017) that found that Portuguese older people with dementia had significant lower EGP's total score compared with people without dementia. Nevertheless, even with a dementia diagnosis, this participant increased the EGP's total score, the motor prevalence score, and the physical constraints score, after the psychomotor intervention. Recent research has been showing the benefits of movement-based therapies in people with dementia, in different areas, such as reduction of strain in joints (Niks & van't Hooft, 2017) in a physical perspective, better psychosocial functioning, improved functional abilities and neuroendocrine functioning (Ho et al, 2020) in a functional level, and a positive impact on anxiety and agitation (Bennett, 2021) in a behavior level. In the intervention implemented in this study, the activities proposed had a strong component of physical and motor demands, because it was based in group dynamics and active tasks. It seems logical that these were the areas that had a positive evolution for this participant. For the same reason it is understandable that the subjects that had their mobility affected during the intervention had worse scores in the final assessment of motor prevalence component.

In this study it is evident the heterogeneity of the results. In our perspective this constitutes a highlight for the importance of taking in account the individual experiences and events in assessment and intervention. Events like falls and the presence of comorbidities could have an important impact on the psychomotor competences assessed and/or in the therapeutic process. In other perspective, including personal details in an individualized intervention seems to be beneficial to stimulate cognitive functions, such as autobiographical memory (Kirk et al, 2019) and in global quality of life (Chenoweth et al, 2019). Even if it is a technology-based intervention, it seems that individualization of this process has positive impacts on a sense of self or in being actively involved in the dynamic proposed (Goodall, Taraldsen & Serrano, 2021). Psychomotor intervention, even if it is developed in a group context, constitutes an individualized therapy, with the reinforcement of the identity of the person as a goal, regardless of the age or condition. It is essential to have a qualitative and individual analysis of the research about the impact of the intervention, in order to respect the principles of psychomotricity. Nevertheless, in a group results analysis, for the participants of this study, psychomotor intervention seems to have had positive effects on psychomotor competences in general and in cognitive-based competences. These results are in accordance with the impact of other movement-based interventions (Brancatisano, Baird & Thompson, 2019; Blanco-Rambo, Izquierdo & Cadore, 2023). This study intends to advance with contents about the importance of the psychomotor intervention in geriatric care, specifically integrated in a multidisciplinary rehabilitation team. In Portugal, nursing homes traditionally have their care oriented for the basic daily living activities. It is important to develop knowledge about the impact of non-pharmacological interventions in older adults with and without dementia, in order to institutions have the necessary information to recruit the health professionals and choose the type of therapies more effective for the population attended in their services.

This study has several limitations. The sample was small and was from a single residential care facility, so it is not representative of all individuals with the same context living. Also, the sample corresponds to a heterogeneous group, with people with and without cognitive deficit/dementia. Although it represents the "usual" type of population in nursing homes in Portugal, in the future could be useful to understand the impact of the program in different populations separately, in order to have more adequate interventions for the characteristics and needs of the older population. Moreover, it was not studied the impact of duration or the dosage of the program. In the future, these factors should be included to maximize the benefits of the intervention.

In the future, research about psychomotor intervention with older people (with and without pathologies) will be carry on with a broader sample and will be studied the impact in different areas – physical and motor competences, cognitive functions, functional capacity, social and emotional factors, and physiological parameters.

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