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FUNCTIONAL CAPACITY IN THE ELDERLY INITIALLY AND AFTER THE THIRD MONTH OF INSTITUTIONALIZATION[1]

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ABSTRACT

Objective: To study the functional ability, cognitive status, frailty, depression and psychomotor performance of older adults when they are admitted to a nursing home and after residing in the nursing home for 3 months.

Methodology: Longitudinal, descriptive and comparative study. 37 people (86.5 ± 5.7 years old) living in nursing homes for less than one month were recruited in the Alentejo region. Data were collected during the first month of institutionalization and after three months of the initial evaluation.

Results: When the participants entered in the institutions, ~83% were classified as frail, ~75% had probable depression, ~62% had some level of dependence on the activities of daily living, and ~25% had cognitive deficits. During the first three months of institutionalization, the level of functionality decreased, but the values of frailty and depression improved. There were no significant changes in cognitive status and psychomotor performance during this time.

Conclusions: When older adults become institutionalized, they tend to show several difficulties in various domains related to their health and quality of life. Despite the different changes found in the variables investigated, in general, the first three months of institutionalization did not have a negative impact on the participants. Probably, this outcome is related to the characteristics of nursing homes.

Descriptors: Institutionalization; aging; frailness; psychomotor performance; depression; cognitive dysfunction.

INTRODUCTION

Aging is an inevitable, progressive and differential process. It is impossible to mark its beginning, since its rhythm varies at a biological, psychological or social level, and its inter-individual variability is notorious[1]. For some people the aging process is a positive experience that is lived in a constructive way, but for others it can be a negative experience that is lived with some despair.

When aging is not well accepted, the person becomes more vulnerable and there is a greater risk of developing depressive symptoms[2], which can lead to profound changes at the global level of functioning[1].

Concurrent to the progressive aging of the population, the number of elderly people living in specialized institutions has also increased. There are several reasons for living in residential settings, including old age, limitations in activities of daily living (ADLs), loneliness, widowhood, low economic resources, lack of social support and health problems[2]. When an elderly person inhabits an institution, several changes are expected to occur, either externally (e.g., a change of environment) or internally (e.g., emotional changes).

Institutionalization is an important moment in the lives of many people. Leaving one's own home to inhabit a new physical/relational space could have consequences in terms of privacy, independence and daily routines. Such changes can be perceived and experienced in several ways. For some people, institutionalization could represent an opportunity to access assistance, protection and personal care services, and a place that provides emotional stability, new affective bonds and an improved quality of life[2]. Conversely, the institutionalization process could lead to detrimental changes in the individual's functionality. Thus, by assuming most of the responsibilities and tasks that were previously under the individual's control, nursing homes could contribute to a loss of independence in the performance of ADLs[3]. Also, some studies report a decrease in cognitive capacity after institutionalization as a result of a low level of intellectual stimulation in the facilities[4]. For example, a study by Alencar and colleagues[5] reported that 93.3% of the participants experienced cognitive changes after their institutionalization. The same study found that the majority of nursing home residents (59.6%) had depressive symptoms. Furthermore, losses in the psychomotor abilities of the elderly after institutionalization have also been reported[2]. It seems that some of these negative changes could be mitigated by adequate psychomotor intervention targeting social, emotional and motor dimensions[6].

Frailty is an important construct associated with aging. It is recognized as a multidimensional, dynamic state that affects individuals who experience losses in one or several domains of functioning (physical, cognitive, affective and social). Frailty is a strong predictor of the institutionalization of older adults, and many people living in nursing homes have significant levels of frailty[7].

To plan appropriate intervention strategies for targeting the quality of life and well-being of older adults residing in nursing homes, one should understand their level of adaptation, as well as the (possible) changes that occur over time in their general level of functioning. However, to our knowledge, there are few studies on this subject. In this context, the main objective of this study is to examine the functionality, general cognitive state, fragility, probable depression and psychomotor profile of the elderly during the first month (t0) and after three months of institutionalization (t1).

METHOD

This is an observational, descriptive and comparative study, conducted in a sample of institutionalized older adults. The assessment of a number of variables was performed during the first month of institutionalization (t0) and after three months (t1).

The sample was collected in the Alentejo region (Portugal). Initially, from 39 nursing homes (offering the social response "Residential Structure for Elderly People", RSEP) contacted to collaborate, 22 agreed to participate in the study. Of these, 5 institutions were excluded, since no residents were in accordance to the inclusion criteria: a) age equal to or above 65 years old, b) being institutionalized for the first time in the RSEP for less than one month, and c) being able to participate in the assessments. The study did not include people coming from other institutions in RSEP social responses or people who were hospitalized just before entering RSEP. The initial sample consisted of 37 people. At time t0, one of the tests (Geronto-Psychomotor Exam) was not completed by 2 participants due to withdrawal. Between assessment t0 and t1, the sample was reduced due to 2 hospitalizations, 2 deaths, and 1 dropout, resulting in a final sample of 30 participants (t1).

The study was conducted in accordance with the Declaration of Helsinki and approved by the Ethics Committee of the University of Évora. The objectives of the study were presented to the participants (and families), and informed consent was obtained. The application of the instruments was performed for each participant individually in a quiet place and free of distracting stimuli. The assessment instruments were administered by one of the researchers in the study, all of whom have a bachelor's degree in Psychomotor Rehabilitation.

Several assessment instruments were applied to collect information about functional status, cognitive status, frailty, probable depression and psychomotor skills. These instruments are now described in brief.

- Sociodemographic questionnaire - This was developed within the scope of this study to collect information such as place of residence, age, marital status, educational qualifications, physical exercise habits, therapeutic (or occupational) interventions, health problems, social relationships, episodes of falls in the last 12 months, use of assistive technologies and reasons and time of institutionalization. In the second stage of evaluation (t1), questions were added about the maintenance of social relationships (with family, friends and/or neighbours), socio-cultural activities in the institution, episodes of falls in the last three months, and the use of assistive technologies.

- Barthel Index (BI[8]) – This is an assessment tool that quantifies the level of functional independence of the subject when performing ten ADLs. The BI was completed at t0 and at t1 based on the information provided by the same technicians from the institutions.

- Mini-Mental State Examination (MMSE[9]) – This allows a general assessment of the individual's mental state, enabling the screening of cognitive impairment.

- Groningen Fragility Indicator (GFI[10]) – This evaluates physical, psychological and social dimensions and is composed of eight domains: mobility, physical condition, vision, hearing, nutrition, morbidity, cognitive functioning and psychosocial aspects.

- Geriatric Depression Scale, reduced version (GDS-15[11]) – This consists of 15 items that measure depressive symptoms in older adults.

- Geronto-Psychomotor Examination (GPE-P[12]) – This consists of 17 items that assess the following dimensions: dynamic and static balance, joint mobilizations, praxis, fine motor skills, knowledge of body parts, vigilance, perceptual memory and verbal, perception, spatial and temporal domain, and verbal and non-verbal communication.

- Institution Adaptation Questionnaire (IAQ) – This was developed within the scope of this investigation, with the main objective of understanding the resident's adaptation to the institution. It is an exploratory questionnaire consisting of 10 questions that use a Likert scale (1 "strongly disagree" to 5 "strongly agree"). Its application was verbal, and it was performed on the individual during the second stage of evaluation (t1). In summary, the questions asked sought to know "satisfaction with the care provided", "respect shown by workers and other residents", "rhythm of adaptation to the institution", "level of privacy", "attention and affection received", "autonomy to make own decisions", "feeling of loss of identity", "feeling of security", "ability of adapting to the routines, rules, and customs of the nursing home", and "the level of control of the institution over the residents". The score of some questions was inverted so that a higher score indicated a greater adaptation level.

The normality of the distribution of variables was tested using the Kolmogorov-Smirnov test and the homogeneity of variance by the Levene test. When the assumptions of normality and homogeneity were not met, non-parametric statistical tests were used. The data were treated through descriptive (mean, standard deviation, median, interquartile range and frequencies in %) and inferential analysis. The *t*-test for paired samples or, alternatively, the Wilcoxon test were used for comparing data between t0 and t1. Correla-

tion analyses were also performed using the Spearman or Pearson test, accordingly. A weak correlation was considered if $r \leq 0.3$, a moderate correlation if $0.4 < r < 0.6$ and a high correlation if $r \geq 0.7$[13]. The level of significance was set at 0.05 (5%). The data were treated with the statistical program SPSS 24 (Statistical Package for Social Sciences).

RESULTS

A total of 37 people (86.5 ± 5.7 years; 27 women and 10 men) aged between 72 and 99 participated in the study. The majority (70.3%) of the participants were widows. Before institutionalization, 73.0% lived in rural areas, and 27% lived in urban areas. About half of the participants (51.3%) stated that they did not know how to read/write.

The initiative of becoming institutionalized came from the participant (44.2%), family members (44.2%) or social action services (11.6%). The reasons for institutionalization were physical disability (31.4%), presence of chronic illness (22.9%), loneliness (18.6%), psychological disability (10.0%), isolation (4.3%) and widowhood (1.4%); 11.4% of respondents reported another unspecified situation.

Before institutionalization, 51.4% of participants lived in their own homes and 18.9% lived with a member of their family. In addition, 21.6% and 8.1% of participants attended a day-care centre and had a home support service before institutionalization, respectively. Most of the participants (62.2%) reported engaging in some leisure activities, therapeutic intervention or physical exercise before joining the RSEP. There was an increase in participation (80%) in this type of activity after three months of living in nursing homes. Most participants (73.0%) reported having suffered at least one fall in the 12 months before institutionalization, and eight participants (26.7%) reported having fallen during the three months of living in the nursing home.

The data obtained through the application of the other assessment instruments are shown in Table 1, where the results are compared between the two assessment times (t0 and t1).

Table 1 – Results of the Barthel Index (BI), Mini-Mental State Examination (MMSE), Groningen Fragility Indicator (GFI), Geriatric Depression Scale (GDE-15) and Geronto-Psychomotor Examination (GPE-P), at both evaluation times (t0 and t1).

	t0 (n=37)	t1 (n=30)	*p*	Statistical Test
BI	80,0 (45,0)	77,5 (56,2)	0,04‡	- 2,04§
MMSE	22,0 (8,0)	25,0 (11,3)	0,44	-0,77§
GFI†	8,6 (3,3)	7,2 (3,1)	<0,01‡	3,43‖
GDE-15†	7,2 (3,1)	5,8 (2,5)	<0,01‡	2,89‖
GPE-P*†	69,8 (14,2)	69,8 (16,0)	0,99	0,01‖

Note: t0, baseline. t1, at three months of institutionalization. (†) Data are expressed as mean and standard deviation (SD); other data are median and interquartile range (IQ). (*) n=35 at baseline. (‡) Significant differences between t0 and t1, $p<0.05$. (§) Value of the statistical test *z* (Wilcoxon test). (‖) Value of the *t*-test for paired samples.

Regarding the BI, the values at t0 were significantly higher than at t1, which indicates that, in general, the participants performed the ADLs with more independence when they entered the institution than after three months. Based on the cut-off values of the BI, it was possible to verify that when entering the institution, 37.9% of participants were classified as independent. After three months of institutionalization, this value dropped to 30.0%.

In the GFI, statistically significant differences were found between t0 and t1, which indicates that, in general, the participants were less frail after three months of institutionalization. Upon entry into the institution, 82.8% of participants were classified as frail and after three months this value had fallen to 69.9%.

Regarding the GDE-15, there was a significant decrease in the mean values obtained between t0 and t1, although the scores still point to probable depression at t1 (values between 5 and 15). Despite a decrease in the mean values, the percentage of people who met the "probable depression" criteria was approximately 75% in both assessments.

We did not find significant differences between t0 and t1 in the psychomotor (GPE-P) or the MMSE scores. The MMSE test indicated that 24.3% (n=9) and 26.6% (n=8) of the participants had cognitive impairment at t0 and at t1, respectively.

Table 2 shows the values of the statistical associations between the variables under study at t0. Significant positive associations (moderate to high) were found between the BI and three tests, namely MMSE, GFI, and GPE-P. Thus, better levels of functionality were associated with better cognitive status, less fragility and better psychomotor competence.

Table 2 – Correlations between Barthel Index (BI), Mini-Mental State Examination (MMSE), Groningen Fragility Indicator (GFI), Geriatric Depression Scale (GDE-15) and Geronto-Psychomotor Examination (GPE-P).

	BI	MMSE	GFI	GDE-15	GPE-P
BI	-	0,59*†	-0,56*†	-0,29†	0,76*†
MMSE	-	-	-0,26†	-0,18†	0,82*†
GFI	-	-	-	0,64*‡	-0,29‡
GDE-15	-	-	-	-	-0,13‡
GPE-P	-	-	-	-	-

Note: * Significant correlation ($p < 0.01$). (†) Spearman test. (‡) Pearson test.

The results also indicated a significant (and high) correlation between the scores in the MMSE and the GPE-P, and a significant (moderate) correlation between the scores of the GFI and the GDE-15. That is, in general, participants with better cognitive status had a better performance in the psychomotor domain, and frail participants had more symptoms of depression.

Regarding the IAQ, which was applied after three months of living in the nursing homes, a median of 3.4 (0.5 interquartile range) was obtained, which suggests that there was a moderate level of adaptation to the institution by the majority of participants.

The IAQ scores were correlated with frailty (GFI) and probable depression (GDE-15) scores, indicating that better individual adaptation to the institution was associated with a lower index of frailty (r=-0.50, p<0.01) and depression (r=-0.71, p<0.01).

DISCUSSION

The main objective of this study was to investigate the functionality, general cognitive status, frailty, probable depression and psychomotor performance of older adults when they started to live in a nursing home and after three months. Additionally, this study intended to investigate the relationship between the variables under investigation.

Regarding functional ability, the results showed that the participants were more dependent with regard to the performance of ADLs after three months of institutionalization. For the general cognitive status and psychomotor performance, there were no significant differences between the two assessment times. It was also found that, in general, subjects were less frail and less depressed after three months of institutionalization. Contrary to expectations, it seems that institutionalization contributed to reducing frailty and depressive status and to maintaining the psychomotor performance and cognitive status of the participants. The level of functionality (performance of ADLs) was the only dimension that was impacted negatively by the first three months of institutionalization.

The advanced age (86.5 ± 5.7 years) of our sample at the time of entry to the institution was representative of the usual position in Portugal. The majority of participants were women, which is in line with statistics that show that women have a higher life expectancy than men[14]. More than two-thirds of the participants were widows, which is in accordance with previous studies that refer to widowhood as a predictor for institutionalization[15]. When their partners die, older people tend to live alone in their homes, which leads to increased loneliness and lack of family support and frequently culminates in institutionalization[2].

With regard to education, the fact that more than half of the people in our study did not have academic qualifications is in agreement with statistical data that highlight Alentejo as the region of Portugal with the highest percentage of illiteracy[14].

There was a high prevalence (73.2%) of falls among the participants in the 12 months prior to institutionalization. Some studies reported that episodes of falls are associated with frailty, often leading to more significant difficulties in performing ADLs and to institutionalization[16]. At the second assessment (t1), eight participants (26.7%) also reported having fallen after entering the nursing homes, which indicates that the problem persisted after entering the RSEP. According to Rapp and colleagues[17], there is a high risk of falls in the first months of institutionalization, since the individual is still trying to adapt to the new environment.

The results of our study indicate that there was a slight (although statistically significant) loss of functionality in the participants over the three months of residence at the nursing homes. The observed decrease in the ability to perform ADLs is in line with other similar studies[18]. These losses may be related to a reduction in the frequency of the ADLs, as the personnel working at the institution help the residents in various tasks. Institutions tend to assume many of the responsibilities that once belonged to the individual (e.g., bathing and dressing), leading to an increased dependence of the residents when performing ADLs[18]. This loss of independence could translate into very low levels of physical activity for older adults in Portuguese nursing homes[19].

Approximately 25% of people had cognitive impairment upon entry to the institution and after three months. Such stability in the participants' cognitive status may be related to the relatively short time (3 months) between the two assessments, but also to the stimulation provided by occupational and socio-cultural activities promoted in RSPE social responses. There is empirical evidence that institutionalized older adults who participate in multimodal interventions, physical exercise, or who are cognitively stimulated, could maintain or improve their general cognitive state[20]. In our study, 80% of the participants performed some type of occupational activity in the nursing homes, including therapeutic intervention or physical exercise.

A decrease of the participant's frailty was found over the three months of living in the nursing homes (82.8% and 69.9% in t0 and t1, respectively). This result is quite interesting, as several characteristics present in our sample are predictors of greater fragility, including advanced age, being female and having a low level of education[21]. The decrease in frailty observed in t1 could be related to possible positive changes in aspects such as nutrition, health care, safety and participation in stimulating activities or to greater interaction with other people. Thus, our results suggest that institutionalization can be a favourable alternative for frail elderly people who have difficulties living alone or with family members. If the institutions are well-organized and have quality resources and services (suited to the individual's needs), it could lead to a better quality of life for the residents.

In terms of depressive symptoms, even though the participants (~75%) in our study showed probable depression in both assessments, a significant decrease in their absolute values (measured by the GDE-15) was found after three months. In a previous study, Maseda and colleagues[22] also reported a significant reduction in symptoms of depression, in this case one year after the first assessment. The authors state that such modification may be due to the care services provided at the nursing homes and that it reflects the individual's good adaption to the institution[22]. Entry to an institution can allow older adults to access

conditions they lacked at home (e.g., basic care, security, social relationships), leading to better emotional stability. In the present study, the values obtained by the IAQ pointed to a very reasonable level of adaptation to the institution (median of 3.4 on a Likert scale from 1 "totally disagree" to 5 "totally agree"). In addition, according to the results obtained, better adaptation to the institution was associated with less frailty (assessed by the GFI) and with less depressive symptoms (determined by the GDE-15).

In our study, there were no changes in psychomotor performance after three months of institutionalization. Given the evident change in context/circumstances that older people experience when living in a nursing home, the maintenance of the psychomotor performance in the first months of institutionalization seems to be a positive result. It should be noted that there is evidence that it is possible to improve the psychomotor competencies of institutionalized elderly people if specific interventions are implemented[6].

In the present study, we also examined the association between the variables when the participants first entered the institution. Such analysis revealed several relationships between the various domains studied. The association between the ability to perform ADLs (as measured by the BI) and general cognitive status, frailty and psychomotor profile stand out. Several previous studies have reported similar associations, which suggests that aging has a generalized effect on cognitive, functional, psychomotor and affective aspects (e.g., Fernandes et al.[23]). In an investigation carried out by Yümin and colleagues[24], a significant relationship was evident between balance, mobility and the performance of ADLs. Using the same assessment instruments in the present study (GPE-P and MMSE), Henriques[25] also found that there is a positive association between cognitive and psychomotor skills in older adults. Interestingly, in our study, functional capacity was not associated with the symptoms of depression. However, previous studies have reported that the onset of depressive symptoms often causes loss or reduction of functional independence.

This study has some limitations that should be highlighted. A relatively short institutionalization period (three months) was investigated, and therefore the results do not reveal its impact in the medium and long term. The characteristics of the institutions, namely the quantity and quality of services provided, have not been investigated in depth. This could have been useful to understand and discuss some of the results found in the various constructs studied. Finally, the size and geographical origin of the sample does not allow the generalization of the results.

CONCLUSIONS

In general, when older adults start living in a nursing home, they have difficulties in several areas related to health and quality of life. The results of the present study suggest that the first three months of institutionalization could have differential effects depending on the domain that is considered. Thus, although the ability to perform ADLs decreased somewhat over the study period, there were significant improvements in the level of frailty and symptoms of depression. On the other hand, general cognitive status and psychomotor performance did not change significantly during the three months of institutionalization. Taking into account these results, we concluded that, for most participants, institutionalization did not have a negative impact. This could be related to the specific characteristics (e.g., quality of health care and physical and cognitive stimulation) of the nursing homes that participated in the study.

REFERENCES

1. Zimerman G. Velhice: Aspetos Biopsicossociais. Porto Alegre: Artes Médicas Sul Ltda; 2000.

2. Cardão S. O idoso institucionalizado. Lisboa: Coisas de Ler; 2009.

3. Mitzner TL, Chen TL, Kemp CC, Rogers WA. Older Adults's Needs for Assistance as a Function of Living Environment. Proc Hum Factors an Ergon Soc Annu Meet. 2011;55(1): 152–6.

4. Gonzalez-Colaço HM, Meillon C, Rullier L, Avila-Funes JA, Bergua V, Dartigues JF, et al. Cognitive decline after entering a nursing home: A 22-year follow-up study of institutionalized and noninstitutionalized elderly people. J Am Med Dir Assoc. 2014;15(7): 504–8.

5. Alencar MA, Bruck NN, Pereira BC, Câmara TM, Almeida R. Perfil dos idosos residentes em uma instituição de longa permanência. Rev Bras Geriatr e Gerontol. 2014; 15(4):785–96.

6. Pinto T, Morais A, Varajidás CA, Bodas RA, Coelho E. Perfil Psicomotor e autoestima em idosos institucionalizados com e sem intervenção psicomotora. A psicomotricidade. 2016;19:88–105.

7. Gobbens RJ, Luijkx KG, Wijnen-Sponselee MT, Schols JM. Toward a conceptual definition of frail community dwelling older people. Nurs Outlook. 2010; 58(2):76–86.

8. Mahoney FI, Barthel DW. Functional evaluation: the Barthel Index. Md State Med J. 1965;14:61–5.

9. Guerreiro M, Silva AP, Botelho M, Leitão O, Castro-Caldas A, Garcia C. Adaptação à população portuguesa da tradução do Mini Mental State Examination. Rev Port Neurol. 1994;1(9).

10. Duarte V. Fragilidade nas pessoas idosas. [Tese]. Porto: Universidade do Porto; 2013.

11. Apóstolo J, Loureiro L, Reis I, Silva I, Cardoso D, Sfetcu R. Contribution to the adaptation of the Geriatric Depression Scale -15 into portuguese. Rev Enferm Ref. 2014; Série(3):65–73.

12. Morais A, Santos S, Lebre P. Psychometric Properties of the Portuguese Version of the Éxamen Geronto-Psychomoteur (P-EGP). Educ Gerontol [Internet]. 2016;42(7):516–27.

13. Coutinho C. Metodologias de investigação em ciências sociais e humanas: Teoria e Prática. Coimbra: Almedina; 2016.

14. Instituto Nacional de Estatística, POR DATA. [Web page]; 2019 [updated 2019; cited on 2019 Dec 10]. Available from: https://www.pordata.pt/Portugal

15. Paúl C, Ribeiro O. Manual de Gerontologia. Aspetos biocomportamentais, psicológicos e sociais do envelhecimento. Lisboa: Lidel; 2012.

16. Morley JE, Vellas B, van Kan GA, Anker SD, Bauer JM, Bernabei R, et al. Frailty consensus: a call to action. J Am Med Dir Assoc. 2013;14(6):392–7.

17. Rapp K, Becker C, Lamb S, Icks A, Klenk J. Hip fractures in institucionalized elderly people: incidence rate and excess mortality. J Bone Miner Res. 2008;23(11):1825–31.

18. Pinheira V, Coutinho AJ, Crisóstomo RS, Santos SJ, Pinto SP. Avaliação da capacidade de realização de atividades da vida diária em pessoas idosas. RIASE. 2015;1(2):166–76.

19. Marmeleira J, Ferreira, S, Raimundo A. activity and physical fitness of nursing home residents with cognitive impairment: A pilot study. Gerontol. 2017;100:63–9.

20. Galhardas L, Raimundo A, Marmeleira J. Effects of a multimodal exercise program on cognitive functioning and physical fitness of nursing home residents. Évora: Congress CIDESD; 2017; 157–8.

21. Borges CL, Silva MJ, Clares JWB, Bessa MEP, Freitas MC. Avaliação da fragilidade de idosos institucionalizados. Acta Paul Enferm. 2013; 26(4):318–22.

22. Maseda A, Balo A, Lorenzo-López L, Lodeiro-Fernández L, Rodríguez-Villamil JL, Millán-Calenti JC. Cognitive and affective assessment in day care versus institutionalized elderly patients: a 1-year longitudinal study. Clin Interv Aging. 2014;5(9):887–94.

23. Fernandes PM, Cipriano PP, Bezerra MV, Borges S. Síndrome da fragilidade e sua relação com aspectos emocionais, cognitivos, físicos e funcionais em idosos institucionalizados. Rev Kairós. 2015;18(1):163–75.

24. Yüminç ET, Şimşek TT, Sertel M, Öztürk A, Yümin M. The effect of functional mobility and balance on health-related quality of life (HRQoL) among elderly people living at home and those living in nursing home. Arch Gerontol Geriatr. 2011;52(3):e180-4.

25. Henriques BM. O efeito de um programa psicomotor para idosos com demência - importância da psicomotricidade como terapia coadjuvante junto da fisioterapia. [dissertação]. Porto: Universidade Fernando Pessoa; 2013.

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