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Assessment of motor skills in elderly people undergoing hippotherapy: a case report

Avaliação da motricidade em idosos submetidos a equoterapia: relato de caso

Evaluación de la motricidad en ancianos sometidos a equinoterapia: informe de caso

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This is a descriptive and cross-sectional case study carried out from February to December of 2019 in a city in the Triângulo Mineiro region. It aimed to evaluate the benefit of hippotherapy in the elderly's motor skills. Ten sessions of hippotherapy were used and the assessment was made (before and after) by the Motor Scale for Seniors and the Global Motor Aptitude. The participants were five healthy elderly women. In the pre-assessment, all elderly women had higher scores in spatial orientation and lower scores in balance. Three also had lower scores on overall motor skills. After hippotherapy, the five elderly women remained with lower scores on balance and higher scores on spatial orientation, fine motor skills and body scheme. There was an improvement in three patients in overall motor skills, balance and body scheme. Hippotherapy seemed to contribute to the promotion of benefits in the aspects of motor skills in elderly women, considering that there was no worsening in general motor aptitude, allowing the maintenance or improvement of motor performance.
Descriptors: Equine-assisted therapy; Aging; Motor skills.

Trata-se de um estudo de caso, descritivo e transversal realizado no período de fevereiro a dezembro de 2019 em uma cidade do Triângulo Mineiro, com objetivo avaliar o benefício dos atendimentos de Equoterapia na motricidade de idosas. Utilizou-se 10 sessões de equoterapia e aplicou-se (no pré e no pós) a avaliação pela Escala Motora para Terceira Idade e a Aptidão Motora Global. Participaram cinco idosas saudáveis. Na pré-avaliação, todas as idosas obtiveram pontuações maiores na orientação espacial e pontuações no equilíbrio menores. Três obtiveram pontuações menores também na motricidade global. Posterior à equoterapia, as cinco idosas permaneceram com pontuações menores no equilíbrio e pontuações maiores na orientação espacial, motricidade fina e esquema corporal. Houve melhora em três pacientes na motricidade global, equilíbrio e esquema corporal. A Equoterapia pareceu contribuir na promoção de benefícios nos aspectos da motricidade em idosas, considerando que não houve piora na aptidão motora geral, propiciando a manutenção ou melhora do desempenho motor.
Descritores: Terapia assistida por cavalos; Envelhecimento; Destreza motora.

Se trata de un estudio de caso, descriptivo y transversal, realizado de febrero a diciembre de 2019 en una ciudad del Triângulo Mineiro, con el objetivo de evaluar el beneficio de la Equinoterapia en la motricidad de ancianas. Se utilizaron diez sesiones de equinoterapia y se aplicó la evaluación (antes y después) utilizando la Escala Motora para la Tercera Edad y la Aptitud Motora Global. En el estudio participaron cinco ancianas sanas. En la preevaluación, todas las ancianas obtuvieron puntuaciones más altas en orientación espacial y más bajas en equilibrio. Tres de ellas también obtuvieron puntuaciones más bajas en motricidad global. Después de la equinoterapia, las cinco ancianas seguían teniendo puntuaciones más bajas en equilibrio y más altas en orientación espacial, motricidad fina y esquema corporal. En tres pacientes se produjo una mejora en motricidad global, el equilibrio y el esquema corporal. La Equinoterapia pareció contribuir a la promoción de beneficios en los aspectos de la motricidad en ancianas, considerando que no hubo empeoramiento en la aptitud motora general, proporcionando el mantenimiento o la mejora del rendimiento motor.
Descriptores: Terapía asistida por caballos; Envejecimiento; Destreza motora.

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INTRODUCTION

Aging is a phase of life in which there is a decrease in bodily activities, with a decrease in resistance to aggression and an increased risk of illness, which is part of the natural life cycle[1]. According to the 2010 IBGE census, the elderly Brazilian population is comprised of 23 million people, representing 11.8% of the total population of the country. In the coming decades, the number of elderly people in the population tends to increase worldwide. This fact is a harbinger of population growth and brings changes in the demographic and epidemiological profile across the country, producing demands that require responses from social policies involving the State and society, resulting in new forms of care[2].

Physical performance and functional capacity continually decrease with aging[3], with imbalance being one of the main limiting factors for displacement and carrying out daily activities of the elderly, since they lead to a greater risk of falls and fractures[1,4]. Thus, the practice of physical activity is an effective mechanism of prevention and promotion of quality of life for the elderly, contributing to motor coordination, strength, and balance, which reduces the risk of falls and decreases the degenerative effects of age[3].

Hippotherapy is a therapeutic method that uses the three-dimensional movement of the horse, with a view to obtaining functional results in a program of integrated actions. As the horse moves, it is necessary for the practitioner to modulate the muscle tone in order to be able to tune, maintain, recover or adjust the postural balance with each movement[1,5].

Some studies demonstrate favorable effects of this therapy on motor coordination, tonus, stiffness, flexibility, resistance, strength, correction of abnormal movements and improvement of gait and balance[6,7], which can be considered a promising resource for the practice of physical activity in the elderly[3]. The benefits of the practice of hippotherapy go beyond the motor and sensory aspects, and aim to promote improvement in the physical, emotional, social, cognitive aspects, seeking the well-being of the elderly, from the use of the animal as the main agent of therapy[8,9]. Thus, this research aims to assess the benefit of hippotherapy in the elderly's motor skills.

METHOD

This is a case study, descriptive and cross-sectional carried out from February to December 2019 in a city in the Triângulo Mineiro region, with active elderly women, recruited in an elderly care unit.

The Hippotherapy sessions were carried out in partnership with the team of professionals from the Hippotherapy Center Dr. Guerra of the Associação de Pais e Amigos dos Excepcionais - APAE in Uberaba, Minas Gerais, once a week for 30 minutes, for 10 weeks, in the program of hippotherapy, which has an assistant guide to guide the horse and also a lateral assistant, providing security to the practitioner. The site had a specific and adequate area for the development of activities, containing a covered arena with accessibility platform for riding.

According to ethical criteria in research involving animals, the horses were in perfect health and well-being conditions and obey the mandatory criteria for the practice of hippotherapy, that is, they were trained by the institution. All horses had the limb engagement in transpistar, superpistar and antepistar in gait walking and were duly provided with materials necessary for the practice of riding therapy. The saddle (Australian model) was adopted as riding material, with the feet resting on the stirrups. The helmet, as safety equipment, was indispensable for practice and the standardized clothing was pants and closed shoes.

To assess motor skills, the Motor Scale for Older Adults (MSOA) was used in two moments: before and after 10 sessions of hippotherapy. MSOA is a reliable instrument, validated for a population over 60 years, applied individually, which seeks to assess the motor skills of the

elderly. Each test has different degrees of difficulty, which are presented in order of progressive increase[10].

The tests are divided into specific areas of human motor skills: fine motor skills, global coordination, balance, body scheme, spatial and temporal orientation and are graded according to the levels of difficulty. For each level successfully performed, a specific score is adopted and the elderly person advances to the next one; otherwise, zero is recorded and the elderly person remains at the previous level. According to the maximum level the elderly person reaches, a corresponding score is made in each area: level 2 (24 points), level 3 (36 points), level 4 (48 points), level 5 (60 points), level 6 (72 points), level 7 (84 points), level 8 (96 points), level 9 (108 points), level 10 (120 points) and level 11 (132 points). At the end of the tests, a final score (general motor ability) is assigned for the sum of specific aptitudes divided by six[10] as shown in Table 1.

Table 1. Classification of MSOA according to General Motor Ability (G)[10].

Points	Classification
130 or more	Much higher
120 – 119	Higher
110 – 119	High average
90 – 109	Medium average
80 – 89	Low average
70 – 79	Lower
69 or less	Much lower

The evaluations were carried out in a room with ample physical space, silent, well lit and ventilated, free of noise and external interruptions for the development of the tests and applied by the same evaluator. The tests started with fine motor skills, followed by global motor skills, balance, body scheme, spatial and temporal orientation, respectively. For the study in question, only the variables were analyzed: general and specific motor skills.

The materials used were prepared by the researchers from the guidelines present in the instrument manual, which are cubes, thread and needle, shoe string, pencil, sheet, ball, bench, ribbon, chair and toothpicks. The application time lasted an average of 40 minutes, varying between individuals due to individual differences. There was no previous contact with the evaluation instrument, and each test was explained verbally and demonstrated by the evaluator. The subjects were wearing sports clothing and took off only the clothes that could hinder movement during the tests.

For statistical analysis, electronic spreadsheets were created using the Microsoft Excel® program, using the individual raw data of each participant.

According to the precepts adopted in research with human beings, the research was approved by the Research Ethics Committee of the Universidade de Uberaba according to CAAE 03409618.6.00005145 of Plataforma Brasil. The selected individuals received clarifications regarding the objectives and procedures to be carried out by the study and later, those who presented consent and signed the Free and Informed Consent Term, underwent the activities.

RESULTS

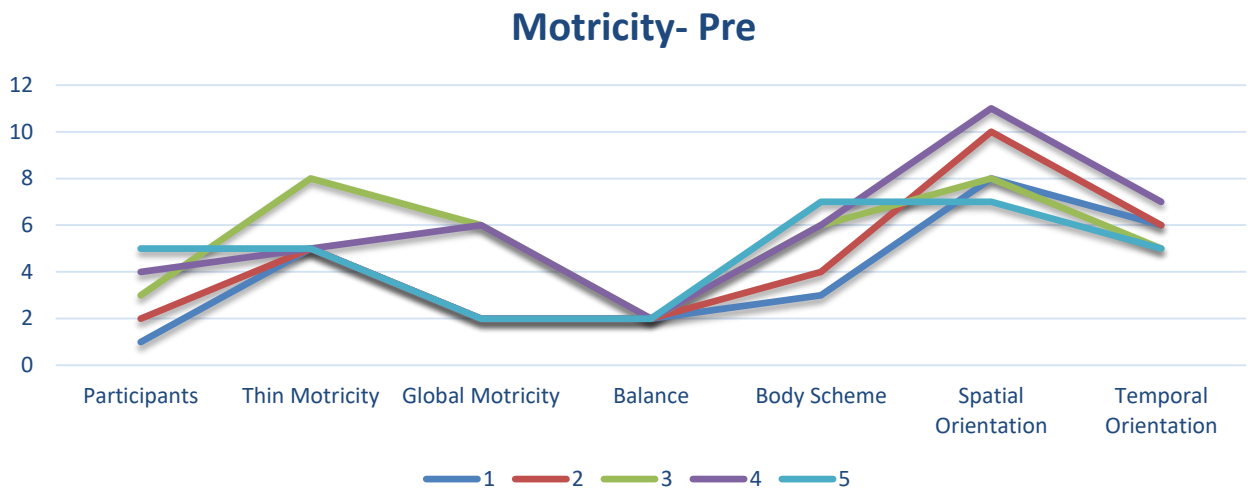
The study started with 10 elderly women; however, 5 dropped out of the study because they had more than two consecutive absences, justified by mobility difficulties and other commitments such as doctor appointments and trips. Thus, five elderly women with a mean age of 71.2 ± 4.54 years were included, practicing activities such as dance, water aerobics, stretching classes, zumba and walking, selected in an Elderly Care Unit.

Four of them denied habits such as smoking and drinking, while one partook both habits. Weights were between 56 and 78 kilograms, and the highest body mass index was 31.6 kg/m^2. The participants had comorbidities such as systemic arterial hypertension, fibromyalgia, depression and type 2 diabetes mellitus, all with medical monitoring and medication control.

At the same time, they did not attend physical therapy and/or rehabilitation visits, they had no physical impairment due to sequelae of stroke or post-surgery, severe osteoporosis, recently consolidated fractures, arterial hypertension without medication control, scoliosis above 45 degrees, uncontrollable fear of the horse and could not have more than two consecutive absences.

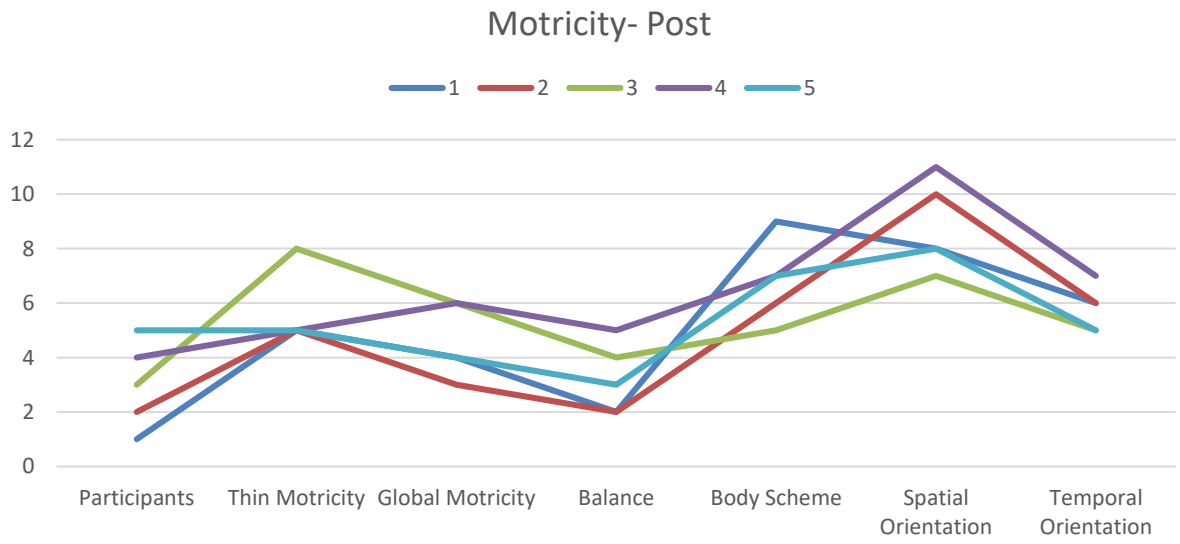
In evaluations prior to the ten sessions of hippotherapy, it was observed that the five elderly women obtained higher scores in spatial orientation and lower scores in balance (Graph 1).

Graph1. Motor skills prior to Hippotherapy, according to MSOA. Triangulo Mineiro, 2019.



After the hippotherapy sessions, the five elderly women had higher scores in spatial orientation and body scheme, and four in fine motor skills. The lowest scores, however, remained in balance (Graph 2).

Graph 2. Motor skills after Hippotherapy, according to MSOA. Triangulo Mineiro, 2019.



In the evaluations prior to the Hippotherapy sessions, it was observed that four elderly women obtained the same fine motor skills orientation score (60 points) and only one reached a higher score (96 points). In overall motor skills, three elderly women reached the lowest score of all (24 points), and two reached 72 points. All elderly women had the lowest scores on balance (24 points), as had already been observed in Graph 1.

The scores varied from 36 to 84 points in the body scheme, and from 84 to 132 points in the spatial orientation, being the area in which all participants obtained the highest score, a data also observed in Graph 1. In the orientation the scores varied between 60, 72 and 84 points. With regard to general motor aptitude, prior to the 10 sessions of hippotherapy, all elderly women presented low performance (below 80), three with a much lower classification (below 70) and two, lower (between 70 and 79), (Table 2).

Table 2. Specific motor skills and General Motor Aptitude (AMG) prior to riding therapy sessions, according to MSOA. Triângulo Mineiro, 2019.

	Participants	Thin Motricity	Global Motricity	Balance	Body Scheme	Spacial Orientation	Temporal Orientation	TOTAL	GMA
PRE	1	60	24	24	36	96	72	312	52
	2	60	24	24	48	120	72	348	58
	3	96	72	24	72	96	60	420	70
	4	60	72	24	72	132	84	444	74
	5	60	24	24	84	84	60	336	56

In the evaluations after the Hippotherapy sessions, it was observed that all five elderly women maintained the same scores in fine motor skills. In global motor skills, one elderly woman increased her score from 24 to 36 points, two elderly women increased from 24 to 48 points and two maintained their scores at 72 points.

Regarding balance, three practitioners increased their scores from 24 to 36.48 and 60 points, and two maintained a score of 24. In the body scheme, three elderly women increased their scores, one maintained; and one decreased by 16.7%.

Regarding spatial orientation, three elderly women maintained their scores, one increased and one decreased, both in the proportion of 12.5%. In the temporal orientation, the five elderly women maintained the score. General motor ability (GMA) remained underperforming in four elderly women (below 80), and one reached a low normal rating (between 80 and 89). However, there was an increase in GMA values in four elderly women and one remained with the same score (Table 3).

Table 3. Specific motor skills and General Motor Aptitude (AMG) after the therapy sessions, according to MSOA. Triângulo Mineiro, 2019.

	Participants	Thin Motricity	Global Motricity	Balance	Body Scheme	Spacial Orientation	Temporal Orientation	TOTAL	GMA
POST	1	60	48	24	108	96	72	408	52
	2	60	36	24	72	120	72	384	64
	3	96	72	48	60	84	60	420	70
	4	60	72	60	84	132	84	492	82
	5	60	48	36	84	96	60	384	64

DISCUSSION

It was possible to analyze the benefits of therapy based on the improvement or maintenance of the general motor skills of the five elderly women, as well as the specific aspects of motor skills.

The lowest scores analyzed during the evaluations prior to the hippotherapy sessions, in all elderly, were in balance, which, according to research, is a skill developed from the interaction between proprioception, vision and the vestibular system[11] with greater relevance for the development of the human postural control[12]. Thus, the results found in the present research corroborate studies that observed that identify aging as a factor that leads to general decrease in body functions, favoring the risk of falling due to the impairment of these functions necessary to maintain balance[13], in addition to triggering loss of muscle strength, mobility, reduced walking ability[4].

Experimental studies suggest that hippotherapy reduces the general risk of fall in elderly people due to flexibility, strength and balance after 16 weeks of intervention, twice a week[3,6]. A

systematic review carried out based on a meta-analysis, analyzed four articles in the context of the practice of hippotherapy in the elderly and provided evidence that the therapy promotes benefits in the balance of the elderly[14].

The comparative evaluations after the Hippotherapy sessions infer an improvement of three patients in the global motor skills, balance and body scheme. These findings demonstrate that the elderly are influenced by the three-dimensional movement of the horse, which provides a dynamic support base, stimulating the body on the vertical (caudal skull), horizontal (lateral lateral) and sagittal (posterior antero) axis and promotes improvement of sensory motor skills such as coordination, balance, body scheme, spatial and temporal orientations, according to previous studies that observed benefits of hippotherapy in balance, flexibility and muscle strength[6].

Research points out that cognitive-motor interventions can improve physical risk factors, such as balance and strength, and cognitive falls in the elderly[15]. Another study indicates that the interaction of human being and horse promotes, in addition to improvements in balance, quality of life, confidence, spasticity, self-esteem and a sense of accomplishment[16]. Therefore, hippotherapy stands out as an effective mechanism of prevention and promotion of quality of life by favoring biopsychosocial aspects of the elderly population[17,18].

When comparing general motor skills before and after consultations, the findings indicate an improvement in aspects of motor skills after hippotherapy in four elderly women; however, one elderly woman remained with a similar score between the pre and post intervention periods. The permanence of values obtained before and after the Hipptherapy in only one elderly woman can be understood as beneficial for this population, since aging is a continuous biological process with individual characteristics and which receives influences from the environment[19].

Recently, a research carried out with elderly people in Hippotherapy has observed an improvement in functional mobility, dynamic balance and flexibility in the elderly[20]. Another study of systematic review meta-analysis showed a beneficial effect of hippotherapy on balance and motor function and considered it a viable therapy for patients with psychomotor, gait and balance disorders[21]. Another research of the systematic review type showed that hippotherapy promotes improvement in balance, mobility, gait capacity and muscle strength in the elderly[22]. Such analyzes reinforce the results obtained in this study when comparing the assessments before and after the riding therapy sessions and, consequently, the contribution to the improvement of the quality of life in the elderly.

CONCLUSION

Hippotherapy seems to contribute to the promotion of benefits in the aspects of motor skills in elderly women, considering that there was no worsening in general motor aptitude, allowing the maintenance or improvement of motor performance of elderly people who practice Hippotherapy.

However, the number of elderly women selected for research is considered as limitations of the study, as it is necessary to increase the number of individuals seeking to better understand the influence of hippotherapy on the motor aptitude of healthy elderly women.

REFERENCES

1. Toigo T, Leal Junior ECP, Avila SN. O uso da equoterapia como recurso terapêutico para melhora do equilíbrio estático em indivíduos da terceira idade. Rev Bras Geriatr Gerontol. [Internet]. 2008 [cited in 25 Feb 2020]; 11(3):391-403. Available from: https://www.scielo.br/pdf/rbgg/v11n3/1981-2256-rbgg-11-03-00391.pdf. DOI: https://doi.org/10.1590/1809-9823.2008.11038

2. Ministério da Saúde (Br). Secretaria de Atenção à Saúde. Diretrizes para o cuidado das pessoas idosas no SUS: proposta de modelo de atenção integral. In: XXX Congresso Nacional de

Secretarias Municipais de Saúde; 2014; Brasília, DF [Internet]. Brasília, DF: Ministério da Saúde, Organização Pan-Americana da Saúde; 2014 [cited in 28 Feb 2020]. Available from: https://bvsms.saude.gov.br/bvs/publicacoes/diretrizes_cuidado_pessoa_idosa_sus.pdf
3. Araújo TB, Silva NA, Costa JN, Pereira MM, Safons MP. Efeito da equoterapia no equilíbrio postural de idosos. Rev Bras Fisioter. [Internet]. 2011 [cited in 25 Feb 2020]; 15(5):414-9. Available from: https://www.scielo.br/pdf/rbfis/v15n5/pt_AOP025-11.pdf
4. Schõne D, Freiberger E, Sieber CC. Influence of skeletal muscles on the risk of falling in old age. Internist [Internet]. 2017 [cited in 25 Feb 2020]; 58(4):359-70. Available from: https://pubmed.ncbi.nlm.nih.gov/28265682/. DOI: 10.1007/s00108-017-0212-5
5. Kwon JY, Chang HJ, Lee JY, Ha Y, Lee PK, Kim YH. Effects of hippotherapy on gait parameters in children with bilateral spastic cerebral palsy. Arch Phys Med Rehabil. [Internet]. 2011 [cited in 25 Feb 2020]; 92:774-9. Available from: https://www.archives-pmr.org/action/showPdf?pii=S0003-9993%2810%2900974-3. DOI: 10.1016/j.apmr.2010.11.031
6. Araújo TB, Oliveira RJ, Martins WR, Pereira MM, Copetti F, Safons MP. Effects of hippotherapy on mobility, strength and balance in elderly. Arch Gerontol Geriatr. [Internet]. 2013 [cited in 28 Feb 2020]; 56:478-81. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0167494312002464?via%3Dihub. DOI: 10.1016/j.archger.2012.12.007
7. Koca TT, Ataseven H. What is hippotherapy? The indications and effectiveness of hippotherapy. North Clin Istanb. [Internet]. 2016 [cited in 28 Feb 2020]; 2(3):247-52. Available from: https://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC5175116&blobtype=pdf. http://dx.doi.org/10.14744/nci.2016.71601
8. Cechetti F, Pagnussat AS, Marin KE, Bertuol P, Todero FZ, Ballardim SAO. Terapia assistida por animais como recurso fisioterapêutico para idosos institucionalizados. Sci Med. [Internet]. 2016 [cited in 26 Feb 2020]; 26(3):ID23686. Available from: https://revistaseletronicas.pucrs.br/ojs/index.php/scientiamedica/article/view/23686/14871. DOI: http://dx.doi.org/10.15448/1980-6108.2016.3.23686
9. Vieira FT, Silva RS, Lemos VR, Azevedo Júnior RR, Vieira MT, Santos MRD, et al. Terapia assistida por animais e sua influência nos níveis de pressão arterial de idosos institucionalizados. Rev Med. [Internet]. 2016 [cited in 26 Feb 2020]; 95(3):122-7. Available from: https://www.revistas.usp.br/revistadc/article/view/111963/120898. DOI: https://doi.org/10.11606/issn.1679-9836.v95i3p122-127
10. Rosa Neto F. Manual de avaliação motora terceira idade. Florianópolis: ARTEMD; 2009. 268p.
11. Sibley KM, Beauchamp MK, Van Ooteghem K, Straus SE, Jaglal SB. Using the systems framework for postural control to analyze the components of balance evaluated in standardized balance measures: a scoping review. Arch Phys Med Rehab. [Internet]. 2015 [cited in 25 Feb 2020]; 96(1):122-32. Available from: https://www.archives-pmr.org/action/showPdf?pii=S0003-9993%2814%2900504-8. DOI: 10.1016/j.apmr.2014.06.021.DOI: 10.1016/j.apmr.2014.06.021
12. Teixeira CL. Equilíbrio e controle postural. Braz J Biomech. [Internet]. 2010 [cited in 28 Feb 2020]; 11(20):30-40. Available from: http://citrus.uspnet.usp.br/biomecan/ojs/index.php/rbb/article/viewFile/151/152
13. Meireles AE, Pereira LMS, Oliveira TG, Christofoletti G, Fonseca AL. Alterações neurológicas fisiológicas ao envelhecimento afetam o sistema mantenedor do equilíbrio. Rev Neurociênc. [Internet]. 2010 [cited in 24 Feb 2020]; 18(1):103-8. Available from: http://www.revistaneurociencias.com.br/edicoes/2010/RN1801/331%20revisao.pdf
14. Araújo TB, Martins WR, Blasczyk JC, Feng YH, Oliveira RJ, Copetti F, et al. Efeito da equoterapia no equilíbrio de idosos: uma revisão sistemática com metanálise. Rev Bras Ciên Mov**.** [Internet]. 2018 [cited in 27 Feb 2020]; 26(3):178-84. Available from:

https://docs.bvsalud.org/biblioref/2018/12/967552/efeito-da-equoterapia-no-equilibrio-de-idosos-uma-revisao-siste_x9GnLZV.pdf
15. Schoene D, Valenzuela T, Lord SR, Bruin ED. The effect of interactive cognitive-motor training in reducing fall risk in older people: a systematic review. BMC Geriatr. [Internet]. 2014 [cited in 24 Feb 2020]; 14(1):1-22. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4181419/pdf/12877_2014_Article_1040.pdf. DOI: 10.1186/1471-2318-14-107
16. White-Lewis S. Equine-assisted therapies using horses as healers: a concept analysis. Nurs Open [Internet]. 2019 [cited in 25 Feb 2020]; 7(1):58-67. Available from: https://onlinelibrary.wiley.com/doi/epdf/10.1002/nop2.377. DOI: http://dx.doi.org/10.1002/nop2.377
17. Agner VFC, Gonsalez AP. Benefícios da equoterapia em idosos: revisão de literatura. Rev Pesqui Fisioter. [Internet]. 2015 [cited in 26 Feb 2020]; 5(3):306-14. Available from: https://www5.bahiana.edu.br/index.php/fisioterapia/article/view/702/507. DOI: http://dx.doi.org/10.17267/2238-2704rpf.v5i3.702
18. Silveira MM, Wibelinger LM. Equoterapia: qualidade de vida para o idoso sobre o cavalo. Rev Kairós [Internet]. 2011 [cited in 25 Feb 2020]; 14(1):181-93. Available from: https://revistas.pucsp.br/index.php/kairos/article/view/6935/5027. DOI: https://doi.org/10.23925/2176-901X.2011v14i1p181-193
19. Fazzio DMG. Envelhecimento e qualidade de vida: uma abordagem nutricional e alimentar. REVISA [Internet]. 2012 [cited in 24 Feb 2020]; 1:76-88. Available from: http://revistafacesa.senaaires.com.br/index.php/revisa/article/view/15/12
20. Diniz LH, Mello EC, Ribeiro MF, Lage JB, Bevilacqua Júnior DE, Ferreira AA, et al. Impact of hippotherapy for balance improvement and flexibility in elderly people. J Bodyw Mov Ther. [Internet]. 2020 [cited in 28 Feb 2020]; 24(2):92-97. Available from: https://www.bodyworkmovementtherapies.com/article/S1360-8592(19)30312-2/fulltext. DOI: 10.1016/j.jbmt.2019.10.002
21. Stergiou A, Tzoufi M, Ntzani E, Varvarousis D, Beris A, Ploumis A. Therapeutic effects of horseback riding interventions. Am J Phys Med Rehabil. [Internet]. 2017 [cited in 25 Feb 2020]; 96(10):717-25. Available from: https://insights.ovid.com/american-physical-medicine-rehabilitation/ajpmr/2017/10/000/therapeutic-effects-horseback-riding-interventions/5/00002060. DOI: http://dx.doi.org/10.1097/phm.0000000000000726
22. Hilliere C, Collado-Mateo D, Villafaina S, Duque-Fonseca P, Parraça JA. Benefits of hippotherapy and horse riding simulation exercise on healthy older adults: a systematic review. PM R [Internet]. 2018 [cited in 25 Feb 2020]; 10(10):1062-72. Available from: https://onlinelibrary.wiley.com/doi/full/10.1016/j.pmrj.2018.03.019. DOI: http://dx.doi.org/10.1016/j.pmrj.2018.03.019

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CONTRIBUTIONS
Adriano José Oliveira contributed to data collection and analysis. Érika Mondin Bulos participated in the conception and writing. **Giovane Amui Fernandes** worked in the design, collection and analysis of data and writing. **Isabella Cecilio Resende Ferreira**, **Janaine Brandão Lage** and **Mariana Nunes Faria** contributed to the conception, collection and analysis of data, writing and review.

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