ORIGINAL ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

CORRELATION BETWEEN FUNCTIONAL CAPACITY AND GRIP STRENGTH OF THE HAND IN ELDERLY VISITORS TO A COMMUNITY CENTER

CORRELACIÓN ENTRE LA CAPACIDAD FUNCIONAL Y LA FUERZA DE AGARRE DE LA MANO EN ANCIANOS QUE FRECUENTAN UN CENTRO DE CONVIVENCIA

CORRELAÇÃO ENTRE A CAPACIDADE FUNCIONAL E FORÇA DE PREENSÃO DA MÃO EM IDOSOS FREQUENTADORES DE UM CENTRO DE CONVIVÊNCIA

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ABSTRACT
The objective of this study was to correlate the functional capacity and grip strength of the hand in elderly people. It is a field research, descriptive type with cross-sectional design and quantitative approach of the data. We included elderly of both sexes, frequenters of the Center for Coexistence and Strengthening of Ties for Elderly in the city of Imperatriz, Maranhão. The exclusion criteria were: failure to complete the study instruments, elderly with communication deficit and unable to hold the dynamometer. The study was approved by the Committee on Ethics and Research in Human Beings, through the opinion N.: 4.067.734. The sample was composed of 83 elderly people, the majority being female (73.5%), white (38.5%), with incomplete elementary school education (63%), retired (89%), income between 1 and 2 salaries (92%), widows (43%). About 84% of the elderly practiced physical activity, 81% had some disease, with arterial hypertension being the most reported (70%). Regarding the functional capacity, 64% of the elderly were independent and with an average grip strength of 17.8kgf for women and 27.0kgf for men. There was a statistically significant positive correlation between the functional capacity and the grip strength of the hand. It is concluded that the grip strength of the hand is an important functional marker in the elderly, because the higher the grip strength of the hand, the greater the functional capacity. Thus, elderly people attending a community center were more active and able to carry out their daily life activities.
Keywords: Functional Capacity; Hand grip Strength; Elderly Population; Living Centers for the Elderly.

RESUMEN
El objetivo de este estudio fue correlacionar la capacidad funcional y la fuerza de agarre de la mano en ancianos. Se trata de una investigación de campo, del tipo descriptiva con diseño transversal y enfoque cuantitativo de los datos. Se incluyeron ancianos de ambos sexos, frecuentadores del Centro de Convivencia y Fortalecimiento de Vínculos para Ancianos de la ciudad de Imperatriz, Maranhão. Los criterios de exclusión fueron: el no llenado completo de los instrumentos del estudio, ancianos con déficit de comunicación e incapaces de sostener el dinamómetro. El estudio fue aprobado por el Comité de Ética e Investigación en Seres Humanos, a través del dictamen N.: 4.067.734. La muestra estaba compuesta por 83 ancianos, siendo la mayoría del sexo femenino (73,5%), raza blanca (38,5%), con escolaridad primaria incompleta (63%), jubilados (89%), ingresos entre 1 y 2 salarios (92%), viudos (43%). Alrededor del 84% de los ancianos practicaban actividad física, el 81% presentaba alguna enfermedad, siendo la hipertensión arterial la más reportada (70%). En relación a la capacidad funcional, el 64% de los ancianos eran independientes y con una fuerza media de agarre de la mano de 17.8kgf para las mujeres y 27.0kgf para los hombres. Hubo correlación positiva, estadísticamente significativa, entre la capacidad funcional y la fuerza de agarre de la mano. Se concluye que la fuerza de agarre de la mano es importante marcador funcional en los ancianos, pues cuanto mayor sea la fuerza de agarre de la mano, mayor será la capacidad funcional. Así, los ancianos que frecuentan un centro de convivencia, se mostraron más activos y capaces de realizar sus actividades de vida diaria.
Palabras Clave: Capacidad Funcional; Fuerza de Agarre de la Mano; Población Anciana; Centros de Convivencia para Ancianos.

RESUMO
O objetivo deste estudo foi correlacionar a capacidade funcional e a força de preensão da mão em idosos. Trata-se de uma pesquisa de campo, do tipo descritiva com delineamento transversal e abordagem quantitativa dos dados. Foram incluídos idosos de ambos os sexos, frequentadores do Centro de Convivência e Fortalecimento de Vínculos para Idosos da cidade de Imperatriz, Maranhão. Os critérios de exclusão foram: o não preenchimento completo dos instrumentos do estudo, idosos com déficit de comunicação e incapazes de segurar o dinamômetro. O estudo foi aprovado pelo Comitê de Ética e Pesquisa em Seres Humanos, através do parecer Nº: 4.067.734. A amostra foi composta por 83 idosos, sendo a maioria do sexo feminino (73,5%), raça branca (38,5%), com ensino fundamental incompleto (63%), aposentados (89%), renda entre 1 e 2 salários (92%), viúvos (43%). Cerca de 84% dos idosos praticavam atividade física, 81% apresentavam alguma doença, sendo a hipertensão arterial a mais relatada (70%). Em relação a capacidade funcional, 64% dos idosos eram independentes e com média de força de preensão da mão de 17.8kgf para mulheres e 27.0kgf para homens. Houve correlação positiva, estatisticamente significativa, entre a capacidade funcional e a força de preensão da mão. Conclui-se que a força de preensão da mão é importante marcador funcional nos idosos, pois quanto maior a força de preensão da mão, maior é a capacidade funcional. Assim, idosos frequentadores de um centro de convivência, se mostraram mais ativos e capazes de realizar suas atividades de vida diária.
Palavras-Chave: Capacidade Funcional; Força de Preensão da Mão; População Idosa; Centros de Convivência para Idosos.

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INTRODUCTION

Population aging is a global phenomenon understood as one of the most significant trends of the 21st century, linked to different factors, such as the decline in birth rates and mortality[1]. In Brazil, it is estimated that 30% of the population will be 65 years or older by 2050, due to both technological advances in health and reduced fertility rates, promoting an increase in the proportion and life expectancy of the elderly population[2].

According to the World Health Organization[3], an individual aged 60 years or more in developing countries and 65 years in developed countries is considered elderly. Thus, aging is a process that causes significant changes in the social, psychological and biological scope of every human being, since each person ages in a unique way, according to his genetics, life habits and space where he is inserted[4].

According to the Brazilian Institute of Geography and Statistics[5], in Brazil the population has maintained its propensity to age over the last 10 years. Between the years of 2012 and 2021, the proportion of individuals aged 60 years or more rose from 11.3% to 14.7% of the population, obtaining an estimated value of 31.2 million new elderly who correspond to a significant increase in the age group in the country.

The aging process evidences active conditions in physiological systems, especially in the neuromuscular system, generating biological alterations capable of leading to a decrease in musculoskeletal mass, muscle strength and functional capacity. Thus, the reduction of muscle mass is considered to be responsible for the decrease in strength and quality of life of the elderly population, which may affect the functional capacity and independence to perform activities of daily living, having the potential to negatively influence the well-being the satisfaction of the elderly person, exposing them to a significant risk of morbidity and mortality[6].

The hand is one of the fundamental components of the human body with action in large part of the evolution of humanity, especially for its unique ability to hold relative to strength and precision[7]. In view of this, the Palmar Gripping Force (PGF) or also called Hand Gripping Force (HGF) is defined as a general indicative of strength and motor skills of the upper limbs in the execution of daily tasks, being considered a relevant identifier of functional declines corresponding to age. The palm grip strength test detects muscle mass losses and is widely used because it is fast, easy and relatively low cost[8].

Therefore, the evaluation of HGF using the dynamometer becomes relevant to investigate the general state of strength of the elderly, as well as to understand their ability and independence in carrying out their daily activities, since the reduction of this force is correlated to the inability and dependence of these individuals in fulfilling them[9].

Functional capacity assists in maintaining the health and quality of life of the elderly, since it assures their ability to perform their trivial activities[10]. It indicates the maximum level of

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functionality that an individual can achieve in a given assignment, intervenes in the decision of a therapeutic intervention and acts as a fundamental health indicator[11]. Corresponding to this, the evaluation of functional capacity aims to maintain the health condition, prevent injuries, and guarantee autonomy and independence to the elderly person[12].

In addition, functional capacity can be evaluated by devices composed of several indicators, including the Barthel index. This scale presents itself as an effective alternative in the evaluation and quantification of the level of independence of the elderly, by performing 10 activities such as: eating, sanitizing, using toilets, bathing, dressing and undressing, controlling the sphincters, walk, move from chair to bed, climb and descend stairs, and their total can vary from 0 to 100 points[13].

Given the above, it is important to know the correlation between functional capacity and HGF, since both are configured as predictors of independence and functionality. In addition, they may guide new means of promotion, prevention and treatment of health complications in the elderly.

Thus, this study aims to correlate the functional capacity with the grip strength of the hand in elderly people attending a living center.

MATERIALS AND METHODS

The present study is a field research, descriptive type with cross-sectional design and quantitative data approach. The study was approved by the Committee of Ethics and Research in Human Beings of the Center for Higher Studies of Caxias of the State University of Maranhão (CESC/UEMA), through the CAAE: 30609320.9.0000.5554 and opinion N.: 4.067.734.

The study was conducted at the Center for Coexistence and Strengthening of Ties for elderly people in the city of Imperatriz, Maranhão. The institution offers health services, provided by nutritionists, physical educators, nurses, psychologists and physiotherapists, as well as administrative and assistance services, with the aim of developing a healthy and active aging, greater social conviviality, and improvement of quality of life.

The data collection took place between the months of March and August 2023, with the sample formed by convenience and the study population composed of all the elderly who were attending the living center during the data collection period.

The study included elderly people (aged 60 years or over) of both sexes, who frequented the Center for Coexistence and Strengthening of Ties for the Elderly. The exclusion criteria were: failure to complete the instruments of the study, elderly with communication deficit and unable to hold the dynamometer.

To obtain the information, the elderly were approached at the reception of the study site, where it was explained about the objectives and benefits of the study, being then invited to participate in this research. After the consent of the participants, by signing the

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informed Free Consent Form, data collection was carried out.

Initially, sociodemographic and clinical data of the participants were collected from a questionnaire prepared by the authors and divided into three parts. In the first part, the items were collected: name, age, sex, race, weight, height, body mass index (BMI), schooling, income, marital status, profession and household composition. The second part was composed of questions on: comorbidities, life habits, drug history and complementary information. The third part was composed of data related to the history of falls and hospitalization in the last 12 months. In addition, the Barthel Index was applied to evaluate the functional capacity and evaluation with dynamometer to verify the grip strength of the hand.

The Barthel Index was created in 1955 by Dorothea W. Barthel, it is used as a resource that evaluates the functional condition and the level of independence of the human being in the execution of its activities of daily life, such as bowel and bladder control, use of the bathroom, transfers (bed to chair and vice versa), mobility (on flat surfaces) and stairs[14].

Information can be obtained quickly, through dialogue with the elderly or their caregiver. The total score varies from 0 to 100, making it possible to stratify the level of dependency in: < 20: total dependence; 21-60: severe dependence; 61-90: moderate dependence; 91-99: mild dependence; and 100: independence[15].

The grip strength of the hand was verified with the use of the digital dynamometer model EH101, brand Instruterm. The test was performed with a patient sitting with his feet on the floor, elbow flexed at 90º, forearm adjacent to the body and the device adjusted to the size of the patient's hand, then, the individual used the maximum palm gripping force with his dominant hand around three seconds, in triplicate, with 30-second intervals between one measurement and another, to consider the average of the three measurements. For the classification, values below 27kgf for men and 16kgf for women were used as low hand grip strength parameters, respectively[16].

The collected data were organized in spreadsheets of the Microsoft Excel program, and statistical analysis was performed through the Statistical Package for the Social Sciences (SPSS) program considering significance level of 5% ($p<0.05$). Continuous variables with normal distribution were expressed with mean standard deviation. The categorical variables were expressed as percentages and frequency. For correlation between two numerical variables (Barthel index and hand grip strength) the Pearson coefficient was used, with a reliability index of 95% and $p \leq 0.05$.

RESULTS

The sample consisted of 83 elderly with mean age of 71.1 years (SD=6.54), with minimum 60 and maximum 89 years. The majority of the elderly were female (73.5%), white (38.5%), with incomplete elementary

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school education (63%), retired (89%), income between 1 to 2 salaries (92%) and widows (43%). Regarding housing, 40% of the elderly lived with only one person, being some family member. Data on sociodemographic characteristics are presented in table 1.

Table 1 - Sociodemographic characteristics of the elderly participating in the study (N=83). Imperatriz-Maranhão (2023).

Variables	N	%
Sex		Q
Female	61	73.5%
Male	22	26.5%
Race		
White	32	38.5%
Black	29	35%
Brown	22	26.5%
Education		
Illiterate	14	17%
Incomplete primary school	52	63%
Complete primary school	2	2%
Incomplete high school	5	6%
Complete high school	4	5%
Complete higher education	6	7%
Profession		
Working	1	1%
Unemployed	5	6%
Retiree	74	89%
Others	3	4%
Income		
No income	2	2%
<01 wage	5	6%
Between 01 and 02 wages	76	92%
Marital status		
Single	15	18%
Married	23	28%
Divorced	9	11%
Widowed	36	43%
How many people live with the elderly		
None	26	31%
One person	33	40%
Two people	14	17%
Three people	4	5%
Four people	3	4%
Five people	1	1%
Over five people	2	2%
Kinship of the people who live with the elderly		
Spouse/partner	16	19%
Children	8	10%
Alone	26	31%
Other family members	33	40%

Source: Research data (2023).

As for health conditions, a higher number of elderly with comorbidities (81%) was found, and systemic arterial hypertension was the most reported (70%). There was a prevalence of elderly people who used some type of medication (84%), with antihypertensives (69%) being the most used. Most of these elderly practiced physical activities (70%), 30% denied

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alcoholism, 51% were ex-smokers and with Body Mass Index (BMI) classified as overweight (47%). Regarding the history of falls and hospitalization in the last year, 70% did not suffer falls and 94% did not require hospitalization.

Given the importance of falls in the context of gerontology, information about the fall episode was investigated in the elderly of the sample who reported falling (n=25). Of these, 19% reported an accidental fall, with the out-of-home environment being the most prevalent (18%) and only 23% presented complications. Table 2 presents data on the health conditions of the elderly participants in this study.

Table 2 – Characteristics of the conditions of the participating elderly's health (N=83). Imperatriz-Maranhão (2023).

Variables	N	%
Disease		
Yes	67	81%
No	16	19%
Comorbidities*		
Arterial hypertension	57	70%
Diabetes mellitus	17	20%
Anxiety	14	17%
Arthritis/arthrosis	11	13%
Heart Diseases	8	10%
Others	32	39%
Use of drugs		
Yes	70	84%
No	13	16%
Number of drugs		
None	13	16%
1 or 2 drugs	49	59%
3 or 4 drugs	20	25%
5 or more drugs	1	1%
Most used drugs+		
Antihypertensive	57	69%
Hypoglycemic	13	16%
Anxiolytic	5	6%
Anti-inflammatory	3	4%
Others	9	11%
Physical activity		
Yes	70	84%
No	13	16%
Alcohol		
Yes	14	17%
No	44	53%
Quit	25	30%
Smoking		
Yes	1	1%
No	40	48%
Quit	42	51%
Body Mass Index (BMI)		
Normal (18.5 - 24.9)	26	32%
Overweights (25 - 29.9)	39	47%
Obesity (≤30)	18	21%
Hospitalization in the last year		
Yes	5	6%
No	78	94%
History of fall in the last year		
Yes	25	30%
No	58	70%

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Cause of the fall (N=25)		
Accidental	16	19%
Imbalamce	8	10%
Dizzinness	1	1%
Place of the fall (N=25)		
House	10	12%
Out of home	15	18%
Complications due to the fall (N=25)		
Yes	23	28%
No	2	2%

*: the participants may have reported more than one type of comorbidity.
+: the participants may use more than one drug.
Source: Research data (2023).

The general classification of participants according to the degree of dependence, according to the Barthel Index, showed that the elderly interviewed were mostly independent, because 64% did not need any help to carry out their basic activities of daily living and 36% had mild dependence. Data on the independence levels of the elderly studied are presented in table 3.

Table 3 – Classification from the scores of the Barthel Index in the elderly participating in the study (N=83). Imperatriz-Maranhão (2023).

Score	Result interpretation	N	%
100 Points	Totally independent	53	64%
91 - 99 points	Mild dependence	30	36%
61 - 90 points	Moderate dependence	0	0,0
21 - 60 points	Severe dependence	0	0,0
< 20 points	Total dependence	0	0,0
Total		83	100

Source: Research data (2023).

In the evaluation of HGF, it was found that both men and women had adequate grip strength with the dominant hand in relation to the standard of normality for each sex (≥27kgf for men and ≥16kgf for women). Table 4 shows the data related to the average grip force resulting from the evaluation with the dynamometer.

Table 4 – Gripping force of the hand in relation to the sex of the elderly participating in the study (N=83). Imperatriz-Maranhão (2023).

Variable	Sex	N	Mean	Median	Desvio - padrão
Gripping force of the hand	Women	61	17.8	17.8	3.96
	Men	22	27.0	26.4	7.56

Source: Research data (2023).

On the correlation of the grip force of the hand evaluated with the dynamometer and the functional capacity through the Barthel Index score, it was observed that there was a weak positive correlation (r of pearson=0.2146; p=0.05) statistically significant in the total sample. Thus, the greater the grip strength of the hand, the greater the functional capacity. We also verified the correlation of the handgrip strength score and the Barthel scale with other variables,

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such as: age, BMI, and amount of medication. Observed - if statistical significance only in the correlation between PPF and age, weak negative correlation (r=-0.212; p=0.05). Where, the older the age, the younger the FPP. In relation to the Barthel scores, this did not present a significant correlation with the variables analyzed. Data on the correlation between hand grip strength, functional capacity, age and body mass index are presented in table 5.

Table 5 – Correlation between Gripping force of the hand, Barthel Index, age and Body Mass Index (BMI) in the elderly participating in the study (N=83). Imperatriz-Maranhão (2023).

		Gripping force of the hand	Barthel
Gripping force of the hand	Pearson R	—	
	p-value	—	
Barthel	Pearson R	0.215	—
	p-value	0.051	—
Age	Pearson R	-0.212	0.048
	p-value	0.054	0.666
Body Mass Index	Pearson R	-0.107	-0.051
(BMI)	p-value	0.335	0.645
Number of drugs	Pearson R	-0.050	0.097
	p-value	0.652	0.381

Source: Research data (2023).

DISCUSSION

The findings of the current study sought to know the correlation between the functional capacity and the grip strength of the hand of 83 elderly people attending a Center for Coexistence and Strengthening of Ties for the Elderly in the city of Imperatriz do Maranhão.

Regarding the sociodemographic characteristics of the sample, this study showed the predominance of female elderly. This fact is justified from the process of feminization of old age and explained by the longevity of women, based on some aspects such as: hormonal factors, life habits, greater search for health services and less exposure to risk agents such as smoking, alcoholic beverages, workplace accidents and automobile accidents[17]. In addition, according to the demographic data of IBGE[18], women reached a life expectancy of 80.1 years while men 73.1 years, since there is a greater discrepancy between the mortality rate of men and women, being explained by the high incidence of deaths due to unnatural or external causes, which affect more strongly the male population.

Of course, the prevalence of women stands out among men in the search for living centers, this may be related to looking at the difference in representation of old age for both sexes, since women are more interested in social issues and health care, while men, by culturally acting as providers of the home or by prejudice, end up opposing to participate in these centers of coexistence[19].

Most of the elderly self-declared themselves as white, corroborating with a study that evaluated the prevalence between functional capacity and chronic diseases in 207 elderly registered in the family health strategy in the city

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of Diamantina, Minas Gerais[20]. The same, identified the prevalence of white elderly, female, retired and hypertensive.

When the analysis of education level was performed, most participants had incomplete elementary school. This result was similar to a study conducted in a community center that evaluated the relationship between functional capacity and depression level in 55 elderly participants of this group[21], where there was a predominance of elderly with incomplete elementary school, thus, they found that the higher the level of schooling in the elderly, the better is the quality of life, access to information and self-perception related to health.

From the perspective of economic determinants, most elderly participants were retired and received between one and two minimum wages. The elderly pensioners have their income restricted to a minimum wage, imposing a limit on the acquisition of services and consumer goods, forcing the need for an extra income to ensure better survival conditions[22].

There is also a predominance of widowed elderly (43%) who constitute a dominant part of the demand for this type of social participation. The death of the spouse can promote the search for centers of coexistence, serving as a subterfuge to face the pain of loss, moreover, widowhood for women, benefits the interest for other relationships outside the family environment, since the elderly woman sees herself detached from the obligations belonging to the previous marriage, enabling quality of life in old age and the implementation of other activities in the routine[23].

As for the family composition of the research participants, it is known that most of them do not live alone but in the company of a relative. Studies reiterate that the family is a primary source of base and strengthening of the general health of the elderly, in short, good family functionality correlates with a greater perception of health of the elderly person, absence of falls, depression and functional disability[24].

Regarding health conditions, in general, the elderly presented with comorbidity and use of 1 to 2 drugs. Systemic arterial hypertension was the most reported pathology in this study; elderly people with this disease have more health problems and use more medicines than those without hypertension[25]. Regarding the history of medication, antihypertensives were highlighted as the most consumed by the elderly. The high prevalence of comorbidities among the elderly explains the consumption of drugs in large quantities in this age group. Among the most prescribed drugs for elderly people are those with action on the cardiovascular system, since the main diseases responsible for the death of this population are cardiovascular[26].

The present study observed a high incidence of elderly people who practiced physical activity. According to a study that aimed to compare the satisfaction with life of 133 elderly people who frequented living centers and their attitudes towards old age, as a function of the level of physical activity, it was found that

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most of these with a degree of active physical activity, resulting from living together within this environment that promotes the practice of physical activities[27].

Regarding alcoholism and smoking, 53% of the elderly participants in the survey reported not using alcoholic beverages and 51% being ex-smokers. A study conducted on the sociodemographic and clinical profile of 381 elderly people accompanied by Family Health teams revealed that there was a prevalence of elderly ex-smokers who did not consume alcoholic beverages[28].

The BMI is calculated according to the formula of weight divided by height squared, which allows verifying whether or not the person has the appropriate weight[29]. The assessment of BMI in the elderly person is classified as low weight (<18.5kg/m^2), normal weight (18.5 to 24.9kg/m^2), overweight (25 to 29.9kg/m^2) and obesity (equal or greater than 30kg/m^2), and above the normal assumes overweight with tendency to obesity and below the normal, indicates a state of malnutrition(30).

In relation to the Body Mass Index (BMI) of the elderly participants of the survey, in general, they were overweight. Consenting to a study that aimed to describe the evolution of BMI and analyze its association with the sociodemographic variables of 35,214,802 elderly Brazilians, through data from Family Budget Surveys (FBS) available from the Brazilian Institute of Geography and Statistics (IBGE) in 2002/03 and 2008/09, where it obtained as a result the prevalence of overweight elderly people[31].

With regard to falls and hospitalization, there was a predominance of elderly without a history of falls and hospitalization in the last year. Revalidating the result, a study aimed at analyzing the clinical-functional vulnerability of 216 elderly participants from a community center found that most of them also reported not having experienced episodes of falls and hospitalization in the last 12 months[32].

The elderly who attend community centers other than institutionalized ones have more access to activities that improve their fitness and make them active. Explained by a study, where the elderly presented a lifestyle far from sedentary life with the practice of physical exercises developed in community centers, being able to avoid the process of frailty, functional disability, hospitalization and falls[33].

On the other hand, the elderly participants of the study who reported falls presented the reason for the fall in an accidental way, outside the home and with complications. In a study that evaluated falls and health-related quality of life in 1000 elderly, showed as results, the report of elderly who suffered from episodes of falls within the household and showed greater impairment in functional capacity than those who suffered falls outside the household, moreover, the most frequent circumstances were those caused by accidental loss of balance[34].

According to the results of the Barthel Index, it was observed that 64% of the survey participants classified themselves as

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independent. Similar data with a study that correlated the results of tests to assess functional capacity, using the Katz Index, Lawton-Brody Index, Barthel Index and Pfeffer Index in elderly participants of a social inclusion project in Teresina, Piauí, where he stated that the sample studied was considered independent functional[35].

In a study aimed at analyzing the functional capacity and quality of life in elderly participants and non-participants of health promotion groups, it was found that the elderly frequenters living groups, presented a higher level of functional capacity and quality of life than those who do not participate in any group. This shows that despite the intrinsic functional deficits in old age, the elderly who remain active and engaged in social interaction can age in a healthier and more functional way[36].

The HGF of the elderly participants remained within normal parameters for both sexes. The literature argues that the hand grip strength test is an excellent predictor of overall strength and has higher levels in men than women, due to the fact that they have a high proportion of muscle mass and better functional level, nevertheless, active women are within the normal standards in relation to grip strength[37].

The present study showed a weak positive correlation (r of pearson=0.2146; p=0.05), statistically significant between palm grip strength and functional capacity. A study that evaluated the correlation of functional and nutritional status in elderly patients admitted to a general surgery service with a sample of 89 participants. We then measured your grip strength of the hand using a dynamometer, to measure the grip force in people with possible disorders that may affect the upper limbs, then performed an assessment of functional independence through the Barthel Index that investigates the individual's ability to perform some activities. They resulted in a moderate positive correlation ($R = 0.531$; $p < 0.01$) and the greater the grip strength of the dominant hand, the better the functional capacity[38].

In relation to age and grip strength of the hand, in this study there was a weak negative correlation (r=-0.212; p=0.05). Corroborating with a study conducted in a northeastern Brazilian city, which aimed to evaluate and correlate the grip strength of the hand and the nutritional status of elderly women attending a living center for the elderly, also verified the HGF in relation to age and concluded that the higher the age, the lower the HGF and that these have a negative correlation with each other[39].

The results of this study confirmed the presence of a correlation between functional capacity and grip strength in elderly people. However, it is interesting to highlight the limitation found and make possible recommendations for future studies that involve the theme, such as: the non-homogeneity of sex distribution, where there was predominance of females in relation to males, restricting greater results. Thus, this study addresses new issues that could be adopted in future studies, such as a more similar number of individuals of both sexes

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and the correlation of HGF and functional capacity among them.

CONCLUSION

Functional capacity is a health predictor of the elderly population, so factors that correlate with it are of great importance for evaluation in this population. Added to this, the grip strength of the hand reflects the overall strength, being a form of easy evaluation and reliability.

This study presented as a sample, elderly people who were mostly female, aged between 60 and 89 years, self-declared white, attended elementary school in an incomplete way, retired, with income between 1 to 2 salaries, widows, and most of them had some type of comorbidity, especially systemic arterial hypertension. In reference to the grip strength of the hand, the elderly presented adequate grip strength in relation to the standard of normality. On the functional capacity, the largest proportion of participants in the research showed functional independence, according to the Barthel index. There was a statistically weak positive correlation (r of pearson=0.2146; p=0.05) between them. Thus, the greater the grip strength of the hand, the greater the functional capacity.

The results of this study showed that the grip strength of the hand is associated with an increase in the functional capacity of elderly people attending a Community Center in the interior of Maranhão. Where there was a prevalence of active elderly able to carry out their daily activities, which demonstrates the importance of the assistance offered by this type of institution.

Finally, this study fulfilled the proposed objective, allowing to know the sociodemographic profile and the correlation between the functional capacity and grip strength of the elderly people attending the Center for Coexistence and Strengthening of Ties in the city of Imperatriz do Maranhão. Therefore, the knowledge of these data can serve as a support to health professionals, facing the prevention of possible functional limitations and disabilities, favoring the maintenance of the functional capacity of the elderly living in this center.

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Marcelo Henrique Ribeiro de Azevedo. Data organization and collection; Research planning and field data collection; Study analysis and creation of tables and figures; Writing the final article;

Gabriel Bertalha Alves. Text review and addition of significant parts; Grammatical correction;

Francisco Dimitre Rodrigo Pereira Santos. Text writing and methodological adjustments; Critical

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review of the text; Data analysis; Grammatical correction;

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