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Planning and goals for compliance of the systemic hypertension treatment in the elderly

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ABSTRACT

Introduction: Non-compliance with hypertensive treatment goals promotes the early onset of cognitive impairments and affects the functionality of the elderly. One of the functions affected is planning, a component of the executive functions which allows the individual to schedule tasks and make decisions. **Objective:** Determine the relationship between planning and the goals for compliance related to the hypertensive treatment in the elderly. **Methodology:** Descriptive-correlational design that included 52 people over the age of 60, men and women, diagnosed with systemic hypertension, recruited into mutual aid groups in the State of Jalisco. The Tower of London test was applied and blood pressure, body mass index, total cholesterol, sodium and tobacco consumption were measured. Several measurements were made in order to establish the relationship between them. **Results:** Women predominated (80.8%), average age was 70.2 years (*SD*=6.8) and the evolution of the occurrence of systemic hypertension was 11.0 years (*SD*=7.3). Weak correlations (p=<.05) were identified between blood pressure and total of correct movements, blood pressure and total time of resolution; as well as between the body mass index and the total rule violation. **Conclusion:** The elderly with the greatest difficulties in planning were the ones who had the greatest non-compliance of the hypertensive treatment and specifically the body mass index, therefore, health professionals must link the efforts that support the elderly regarding the changes in lifestyle.

Key words: Planning; Elderly; Hypertension. (DeCS).

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Planeación y cumplimiento de metas del tratamiento de la hipertensión arterial sistémica en el anciano

RESUMEN

Introducción: El incumplimiento de las metas de tratamiento hipertensivo, favorece la aparición temprana de alteraciones cognitivas y afecta la funcionalidad del anciano. Una de las funciones afectadas es la planeación, componente de las funciones ejecutivas que permite al individuo programar tareas y tomar decisiones. **Objetivo:** Determinar la relación entre la planeación y las metas de cumplimiento del tratamiento hipertensivo en ancianos. **Metodología:** Diseño descriptivo-correlacional que incluyó 52 personas mayores de 60 años, hombres y mujeres, con diagnóstico de hipertensión arterial sistémica, reclutados en grupos de ayuda mutua en el Estado de Jalisco. Se aplicó la Torre de Londres, se midió presión arterial, índice de masa corporal, colesterol total, consumo de sodio y tabaco. Se realizaron varias mediciones para establecer relaciones entre ellas. **Resultados:** Predominaron las mujeres (80.8%), la media de edad fue 70.2 años (*DE*=6.8) y de evolución de hipertensión arterial sistémica fue de 11.0 años (*DE*=7.3). Se identificaron correlaciones débiles (p=<.05) entre presión arterial y total de movimientos correctos, presión arterial y tiempo total de resolución; e índice de masa corporal y violación total de reglas. **Conclusión:** Los ancianos con mayores dificultades en la planeación fueron los que presentaron mayor incumplimiento del tratamiento hipertensivo y de forma específica con el índice de masa corporal, por ello, los profesionales de enfermería deben vincular esfuerzos para fortalecer las estrategias que apoyen a los ancianos en la modificación del estilo de vida.

Palabras clave: Planeación; Anciano; Hipertensión (DeCS).

Planejamento e metas para a adesão ao tratamento sistêmico da hipertensão em idosos

ABSTRATO

Introdução: O não cumprimento dos objetivos do tratamento hipertensivo promove o aparecimento precoce de comprometimentos cognitivos e afeta a funcionalidade do idoso. Uma das funções afetadas é o planejamento, um componente das funções executivas que permite ao indivíduo agenda tarefas e tomar decisões. **Objetivo:** Determinar a relação entre o planejamento e as metas de adesão relacionadas ao tratamento hipertensivo em idosos. **Metodologia:** Projeto descritivo-correlacional que incluiu 52 pessoas com mais de 60 anos de idade, homens e mulheres, diagnosticadas como hipertensão arterial sistêmica, recrutadas em grupos de ajuda mútua no Estado de Jalisco. O teste da Torre de Londres foi aplicado e pressão arterial, índice de massa corporal, colesterol total, consume de tabaco e álcool medidos. Várias medidas foram feitas para estabelecer a relação entre elas. **Resultados:** As mulheres predominaram (80,8%), a idade média foi 70,2 anos (DP-6.8) e a evolução da ocorrência de hipertensão arterial sistêmica foi de 11,0 anos (DP-7.3). Correlações fracas (p=<.05) foram identificadas entre pressão arterial e tempo total de resolução; bem como entre o índice de massa corporal e a violação total da regra. **Conclusões:** Os idosos com maiores dificuldades de planejamento foram os que apresentaram maior não adesão ao tratamento hipertensivo e, especificamente, o índice de massa corporal, portanto, os profissionais de saúde devem articular os esforços que apóiam os idosos em relação às mudanças no estilo de vida.

Palavras chave: Planejamento; Idoso; Hipertensão (DeCS).

INTRODUCTION

Alterations or changes in cognition are one of the most frequent problems associated with age; however, the deterioration of certain cognitive functions, such as the executive functions, may be associated with certain predictors that involve Systemic Arterial Hypertension (SHT) and Diabetes Mellitus type 2 (DM2) [1, 2].

The groups of diseases related to age notably increased the continuous exposure to health problems that considerably impact the elderly, since people reach this stage with chronic diseases and deteriorated health [3].

Age is a risk factor that increases blood pressure and in older people, the prevalence of SHT is higher [4], reporting a prevalence of up to 65% in people aged 60 and above [5].

In 2018, in the State of Jalisco, Mexico, there were 706,449 adults with heart disease, of which only 353,224 had a medical diagnosis, and only 258,559 had a pharmacological treatment; and only 38,148 of them have the condition adequately controlled [6].

SHT is associated to morphological and functional changes in the brain, which manifest as cognitive impairment or dementia of vascular origin. The impact of these alterations transcends the activities of daily life (ADL by its acronym in Spanish) and the quality of life of people who suffer from it [7].

Uncontrolled SHT increases the risk of heart attack, ventricular hypertrophy, and heart failure, the pressure in the blood vessels also can cause leaks of blood to the brain and this can cause strokes [8-10]. Furthermore, SHT can cause kidney failure, ruptured blood vessels, and strokes [9]. One of the effects that SHT could cause to the elderly is the loss of capacity of self-regulation of the bloodstream to the brain [11].

Likewise, SHT leads to additional vascular pathologies which manifest by alterations in cerebral blood flow, hypertrophy and endothelial dysfunction, and vascular remodeling, among many other conditions that promote cerebrovascular disease, which are associated with reduced cognitive function [12-15].

Some studies report that the thickening of the media, lipohyalinosis and proliferation of the intima causes a reduction in the diameter of the arterial lumen and increases the resistance to flow as the narrowing progresses. This decrease in perfusion in the capillary bed can cause small lacunar infarcts and/or more diffuse ischemic changes in the deep or periventricular white matter, called leukoaraiosis [16, 17].

There is evidence that relates SHT to the main causes, either through symptomatic stroke or through its patho-physiological consequences on vessels and brain tissue, being these areas involved in attention, executive functions, and information processing particularly vulnerable [2]. The patho-physiological consequences of SHT in the brain usually affect the prefrontal sub-cortical areas and produce deficit in the abstraction, formulation of objectives, and executive functions [1].

While the objective of anti-hypertensive treatment in adults is stated in terms of decreased cardiovascular and renal morbidity and mortality, the primary objective for the elderly is aimed to the prevention of a stroke, keep the expectations of a life free of disability and maximization of the proper function [18, 19].

Additionally, when analyzing the alterations of systolic blood pressure (SBP) and diastolic blood pressure (DBP) independently, they have been related to modifications in the cerebral microvasculature [20]; the frontal lobe is the most affected area, which shows more mental activity and the seat of functions such as abstract thinking, prediction, intellectual synthesis, ethical behavior, self-conscience, problem resolution, and task planning is attributed to the frontal lobe [21].

Cognitive deficits related to SHT are usually subtle and affect multiple neuropsychological domains, including learning, memory, attention, abstract reasoning, mental flexibility, and psychomotor and visuospatial skills, producing in turn abstraction, objective formulation, and executive functions deficits, linked to the functional integrity of the prefrontal cortex [1, 22].

Cerebrovascular changes resulting from SHT imbalance are associated to vascular alterations, which in turn cause alterations in the white matter; these changes can contribute to the appearance of cognitive deterioration [23]. Deficits in the functioning of the frontal systems (related to attention and executive function) are common in patients with heart failure and SHT can worsen these deficits due to the vulnerability of frontal lobes and and to the dysfunction of brain perfusion [24, 25].

The importance of executive functions resides in that they are responsible for a series of cognitive processes, among which are anticipation, the choice of goals, planning, behavior selection, self-regulation, self-control and the use of feedback [26]. These functions coordinate among them in order to retrieve information stored in the past (for example, mechanisms of access and retrieval of information), and to estimate and anticipate the possible results of options of response in the future in the future (planning, delayed intention, and decision making mechanisms) [27].

From Luria's studies, it is known that the anterior region of the frontal lobes regulates the sequence and planning of the brain activity (mental and motor), which supports problem solving and strategic ability to choose behaviors necessary for carrying out projects throughout life [28, 29]. Planning allows the individual to become aware of the relationship between tasks and strategies, as well as to be able to control the success of his strategies, and thus make decisions about the adoption of these tasks, which would mean abandoning routines to adapt to new situations [29].

Vascular cognitive deterioration has been the focus of at-

tention in recent years due to risk factors associated with SHT (smoking, dyslipidemia, obesity, and lack of physical exercise); the reduction in these risk factors in lifestyle, in conjunction with the timely detection and pharmacological treatment of SHT, could reduce the risk of the early appearance of cognitive deterioration [19].

It is known that the pharmacological treatment partially contributes to the reduction of the blood pressure, and in recent studies it was seen that despite that 79.3% of the people with high blood pressure received treatment, only half of them keep their blood pressure controlled and less than 20% changed their life style [4].

Therefore, the management plan shall include the establishment of the treatment targets, the non pharmacological management, the pharmacological management, the education of the patient, and the monitoring of complications [30]. The proper treatment prevents the advancement of the illness and acute and chronic complications, as well as keeps an adequate quality of life and reduction of mortality by this cause [31].

The main treatment target consists in reaching a blood pressure BP <140/90 mm Hg and in people with diabetes to maintain a BP <140/80 mm Hg and in people over 60 years <150/90 mm Hg [32, 33]. However, BP control is not enough, it must be complemented with other cardiovascular health indicators such as: total cholesterol (CT), body mass index (BMI), reduction of sodium consumption (Na), and avoid or suppress the consumption of alcohol and tobacco [5, 34].

Several studies [35-44] have shown the relationship between SHT and cognitive processes in the elderly; however, it was important to specifically investigate the relationship between planning and goals for compliance for SHT treatment in the elderly (PA, BMI, CT, consumption of Na, tobacco and alcohol) without limiting the control of BP.

METHODOLOGY

A study with a descriptive-correlational design [45, 46] carried out between February and December 2018. The sample size was calculated with the G * Power 3.1.9.2 software [47] to estimate the correlation between two variables with a statistical significance of $\alpha < .05$, medium magnitude of the effect (γ) and power (1- β) of .80, resulting in 50 participants and the sampling was non-probabilistic. The study group was made up of men and women over 60 years of age with a medical diagnosis of SHT; with ≥ 23 points in the evaluation of the Folstein Mini Mental State Examination (MMSE), and with ≤ 5 points in the evaluation of the Geriatric Depression Scale (GDS) recruited in the mutual aid groups of the VI Health Region of six communities from the state of Jalisco, Mexico.

Since the participant granted his approval by signing an informed consent, the compliance with the inclusion criteria was verified. The study complied with the provisions of the General Health Act for Health Research, Title Five, Sole Chapter, Article 100, Section IV [48]; and with the ethical considerations and principles of the Helsinki's General Health Act and Declaration of the World Medical Association for Medical Research Involving Human Subjects [49]. This research obtained the approval of the Research Committee and a State Research Registry.

The variables studied were: General data such as sex, age, education, SHT time of diagnosis, and morbidity. Regarding planning, total movements, total correct movements, total rule violation, total violation of time, total start time, total execution time, total time of resolution were considered, and in goals for compliance of the SHT treatment, PA, BMI, CT, and consumption of Na, tobacco and alcohol were obtained. Normative values such as periodicity between the measurements are shown in Table 1.

The MMSE was one of the instruments used with the objective of establishing a quantification of cognitive skills, which in turn allowed the detection of functional problems; in the Mexican population its reliability is 0.89 [50]. It is made up of 11 items grouped into 5 sections that assess orientation, immediate memory, attention and calculation, language and deferred memory [50, 51]. The points are assigned based on the answers, with 1 point when it is correct and with 0 when incorrect, the maximum score is 30 points. For the interpretation, the result was adjusted to the age and schooling of the subjects, the mean for normality was 26 points for individuals with 5 to 8 years of schooling and 22 points for those with 0 to 4 years of schooling [52].

The GDS evaluates cognitive depressive symptoms, such as mood, hope, death wishes, and capacity for enjoyment [53, 54]; in the Mexican population the GDS has a reliability of 0.84 [55]. It consists of 15 items with dichotomous answers in such a way that 1 point was awarded to the answer Yes in questions 2, 3, 4, 6, 8, 9, 10, 12, 14 and 15. Also, if the answer was NO in questions 1, 5, 7, 11, 13, a point was assigned. For the interpretation, the cut-off points that were used were: from 0 to 5 points without depression, from 6 to 9 points with probable depression, and from 10 to 15 points with established depression (56). Both instruments, that is, the MMSE and the GDS, had an average administration time of 10 minutes.

The Tower of London (TOL DX) [57] test assesses impaired planning processes associated to frontal lobe dysfunction, task organization, plan initiation, memory maintenance during performance, or inhibition of distractors [27]. The material consists of two charts (one for the examiner and one for the examinee) with three bars of different sizes and three colored balls perforated in each chart along with the record sheet, which contains the items to be evaluated. The task consists that the examiner makes a design in his chart, in order that the subject does the same using the least number of movements, starting with an initial design (always different to that of the examiner) [51]. The maximum limit of movements is 20 with a maximum time of 2 minu-

Table 1. . Criteria to assess the degree of control of variables and measurement timetable in the elderly. Jalisco, Mexico, 2018.

Variable (unit of measurement	Degree of Control			Measurement			
	Good	Regular	Bad	Baseline (Week 0)	1 (Week 12)	2 (Week 24)	3 (Week 36)
Goals for Compliance							
Blood pressure (mmHg)	<140/90	140/90 160/95	>160/95	X	X	X	X
Body Mass Index (kg/ m^2)	< 25	25-27	> 27	X	X	X	X
Total cholesterol (mg/dl)	< 200	200-239	> 240	X			X
Sodium (ml/day)	< 2400			X			X
Tobacco (ml/day)	≤ 30 ml			X			X
Alcohol	Prevent or supress			X			X
Variable	**Normative Value**			**Measurement**			
	Mean	***SD***		**Baseline**	**1**	**2**	**3**
Planning							
Total of movements	39.8	(15.8)		X			X
Total of correct movements	3.3	(1.7)		X			X
Total rule violation	0.4	(0.6)		X			X
Total time violation	1.0	(1.1)		X			X
Total time of initiation	45.9	(29.4)		X			X
Total time of execution	282.7s	(122.1)		X			X
Total time of resolution	336.6	(135.4)		X			X

Abbreviation: mmHg=Millimeters of mercury, mg/dl=milligram per deciliter of blood, Kg/m^2=Kilogram of squared height, ml/day=-milliliters per day. *SD*=Standard deviation

Source: Official Mexican Standard NOM-030-SSA2-2009, Fo**r** the prevention, detection, diagnosis, treatment and control of systemic hypertension [34] and normative data for the Tower of London (TOL DX) test [63].

Table 2. Comparison of the degree of control of the goal for compliance of the systemic hypertensive treatment in baseline measurement and measurement 3 in older people. Jalisco, Mexico, 2018 (*n*=52).

	Baseline Measurement			Measurement 3		
	Good	**Regular**	**Bad**	**Good**	**Regular**	**Bad**
BP	82.7%	15.4%	1.9%	90.4%	9.6%	0%
CL	69.2%	25.0%	5.8%	84.6%	15.4%	0%
BMI	13.5%	17.3%	69.2%	13.5%	15.4%	71.2%
	Presente	**Absent**		**Present**	**Absent**	
Na*	98.1%	1.9%		100%	0%	
Alcohol**	100%	0%		100%	0%	
Tobacco**	100%	0%		100%	0%	

Note: BP=Arterial Blood Pressure, CL=Total Cholesterol, BMI=Body Mass Index, Na=Sodium, * Reduction of consumption, ** Prevent or suppress the consumption

Source: Research Data

tes to carry out each item. The administration time ranged between 10 to 15 minutes [57].

A record of the "Hypertensive Treatment Control" designed to assess the SHT treatment goals was carried out according to the schedule of the measurements, while the interpretation of the criteria adhered to what is suggested by current regulations [34]. Body weight was measured with a Teraillon's Speedo White scale [58] and BP with the Microlife BPW100 electronic baumanometer, complying with quality and precision recommendations [59].

The application of the instruments and evaluations took place in the waiting room of the health centers. Initially, the goals for compliance with the SHT treatment were evaluated, that is, for the measurement of BP, the recommendations of NOM-030-SSA2 were followed-2017 [34]; and to determine the BMI, body weight and body height were estimated. For the CL (cholesterol) measurement, participants were asked to fast for two hours, resting in a sitting position for five minutes and the application of a tourniquet for less than one minute, in order to reduce the variability of the blood sample [60]. To assess the consumption of Na, tobacco, and alcohol, a question was directly asked to the participants.

The statistical treatment was carried out in the Statistics Program for Social Sciences (SPSS v.22). The characterization of the study subjects was carried out with the descriptive analysis of continuous and nominal variables. Each of the variables of study was described independently and differences were established between the measurements. To identify the differences between the quarterly measurements (SBP, DBP, BMI), the analysis of variance of repeated measurements was used. Subsequently, the correlation analysis of the variables of study was performed using the Spearman Correlation Coefficient (Rho).

RESULTS

Fifty two (52) older people affiliated to mutual aid groups in the region participated; the average age was 70.3 years (*SD* = 6.8), the majority of them were women (80.8%), with 4.0 years (*SD*= 2.9) of schooling and 11.1 years (*SD*=7.3) having SHT. 30.8% showed only SHT and 69.2% reported some other pathology in addition to SHT, among which dyslipidemias (19.2%) and DM2 (42.3%) stood out. The MMSE recorded an average score of 27.5 points (*SD* = 1.8) and the GDS obtained 2.54 points (*SD* = 2.6).

The behavior of the goals for compliance of the SHT treatment showed that the participants controlled the majority of the indicators except for the BMI that increased in the third measurement, placing 71.2% of the participants in the bad category (table 2). This same indicator was the only one that presented a statistically significant difference (p = <.05) when comparing the baseline measurement ($\overline{X}$ = 29.2, SD = 4.3) with measurement 3 ($\overline{X}$ = 29.5, *SD* = 4.2) (table 3).

For planning, the participants showed a large number of total movements, incurred in more violations (of rules and time), and required more time (execution and resolution) during the test. Additionally, they obtained a lower number of correct movements and a shorter start time. Likewise, when analyzing the differences of the indicators in the measurements, better results were identified in five of the indicators, of

Table 3. Differences among the measurements of SBP, DBP and BMI, with ANOVA of repeated measurements in the elderly. Jalisco, Mexico, 2018 (*n*=52).

	F	***P***	**Pair-wise Comparison**		
			Measure-ment	**Mean difference**	***p***
PAS	.407	.749			
PAD	2.529	.068			
BMI	4.403	.008	MB	.260	.010
			M3		
			M1	.221	.025
			M3		

Note: SBP=Systolic Blood Pressure, DBP=Diastolic Blood Pressure, BMI=Body Mass Index, BM=Baseline Measurement, M1=Measurement 1, M3= Measurement 3
Source: Research Data

which only total movements obtained a statistically significant difference (p = <.05) (table 4).

The correlation analysis between the variables of study in the baseline measurement showed weak but statistically significant correlations between BP and total correct movements (r = -2.93, p = <.05) and BP and total time of resolution (r = .279, p = <.05). In measurement 3, only a statistically significant correlation was found between BMI and total rule violation (r = .277, p = <.05) (table 5).

DISCUSSION

For goals for compliance regarding the treatment of SHT, the increase in BMI in each one of the measurements stood out in an important way, ending with an average of 29.5 (SD = 4.2); nevertheless, these amounts were lower than those reported in another study, both in men ($\overline{X}$ = 30.7, SD = 3.1) and in women ($\overline{X}$ = 34.6, SD = 4.4) (61). This situation reflects the lack of control of the disease with respect to adherence to non-pharmacological treatment and confirms what experts have said, who state that the proportion of elderly people with hypertension who modify their lifestyle as part of treatment barely approaches 20% [4].

The participants showed a greater amount of total movements, carried out more violations, and required more time to do the test when compared to the normative values in the elderly with age and education similar to the study subjects [57]. Moreover, they obtained a smaller number of correct movements and a shorter start time, which would suggest a poor performance of their executive functions that involve planning when comparing their results with normative values [57]. In other words, the greatest difficulties arose in the performance of the categories related to planning quality, management, and control. The TOL DX manual suggests a good planning performance if the subject is able to execute and solve the problem with the least amount of movements [62] and although the total movements decreased in measurement 3, the results were found above of normative values [63].

The existing correlation between BP with two planning indicators, i.e. total correct movements and total time of resolution evidenced what was stated by several authors who have expressed in different ways the effects of SHT on the cognitive function of the elderly and especially in the executive functions [35, 38, 42, 44]. In the assessment, the inversely proportional relationship of the first correlation is also highlighted, which suggests that the total number of correct movements decreased as the BP figures increased. Aguilar et al [64] reported that the most compromised components of the executive function were working memory and planning, and although no statistically significant differences were found between the group of healthy elderly and the group with risk factors (SHT and DM), clinically they reinforced the evidence that there are difficulties in performing tasks that require high levels of attention and processing of executive functions, being more evident in the elderly with the aforementioned risk factors.

The total rule violation score refers to the ability to manage and control executive planning and problem solving in accordance with established rule constraints [57], and the results showed a correlation between the score of the total rule violation with the BMI. Given the above, it would seem logical to suppose that the elderly with greater difficulties in executive planning are those who have the least attachment to SHT non-pharmacological treatment and specifically with regard to healthy eating. Likewise, a study reported that the executive function has implications in the regulation of the eating behavior, and said relationship showed that a low inhibitory control was related to a higher intake of saturated fats [65]. Similarly, researchers in another study showed that overweight and obese

Table 4. Comparison of means obtained in the planning with normative values in the elderly. Jalisco, Mexico, 2018 (*n*=52).

Indicators	Baseline measurement		Measurement 3		Mean Differences		*t*
	Mean	*SD*	Mean	*SD*	Mean	*SD*	
Total of movements	56.9	(27.7)	48.9	(20.7)	-7.96	(28.5)	-2.02*
Total of correct movements	1.8	(1.7)	1.9	(1.4)	.06	(1.6)	.262
Total rule violation	3.2	(3.1)	3.2	(2.2)	.02	(2.8)	.050
Total time violation	2.6	(2.2)	2.2	(1.7)	-.40	(1.8)	-1.60
Total time of initiation	44.6	(28.9)	387	(13.5)	-5.86	(25.5)	-1.66
Total time of execution	462.9	(173.5)	455.8	(149.4)	-7.15	(132.1)	-.391
Total time of resolution	508.9	(192.6)	505.1	(152.6)	-3.77	(154.8)	-.176

Note: *SD*=Standard Deviation
* The difference is significant in the 0.05 level
Source: Research Data

se adults with a BMI> 25 performed worse on the executive function test than normal-weight adults [66, 67], as well as in the global cognitive function [68].

In this sense, it would be possible to speculate that planning in the elderly could play an important role in meeting the goals of the SHT treatment, as well as in the observance to pharmacological and non-pharmacological SHT treatments. However, more studies are required to investigate with more accuracy the other activities of the executive functions and assess their interaction with respect to morbidities that are already very common in the elderly in the southern region of the state of Jalisco. Likewise, it should be considered that in the elderly the BMI will be affected by the reduction in the size and expansion of the curvature of the spine [69], for this reason it will be necessary to incorporate other parameters of nutritional measurement in order to determine with greater certainty the effect of poor nutrition on the cognitive function of the elderly.

The results of this research may be limited by the sample size, which reduces the statistical power to assess the correlation between the variables of study. It is also necessary to extend the follow-up of the participants to evaluate the planning behavior with respect to time, age, and nutritional status.

CONCLUSIONS

The elderly with the greatest difficulties in planning were the ones who presented the highest noncompliance toward the SHT treatment and specifically toward BMI, thus, this highlights an area of opportunity that nursing professionals have to support the elderly regarding the change of their lifestyle and compliance with the SHT treatment target, based on global and multidisciplinary care involving adherence to pharmacological and non-pharmacological treatments addressed to this pathology. Likewise, the need to redouble efforts to reduce the presence of modifiable risk factors in the elderly with SHT is highlighted, and, therefore, maintain the activity of the executive functions and specifically that of planning.

CONFLICTS OF INTERESTS

The authors stated they do not have any conflict of interest.

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Table 5. Assessment of correlation between planning and the goals for compliance of the systemic hypertension in the baseline measurement and measurement 3 in the elderly. Jalisco, Mexico, 2018 (*n*=52).

	Baseline Measurement			Measurement 3		
	PA	CL	BMI	PA	CL	BMI
	R	***r***	***r***	***r***	***r***	***r***
Total of movements	.188	.253	-.093	.061	.178	.131
Total of correct movements	-.293*	-.208	.258	-.176	-.042	.031
Total rule violation	.095	.061	.257	-.004	.211	.277*
Total time violation	.215	.008	-.089	-.031	.120	.204
Total time of initiation	.163	-.021	-.155	.022	.100	-.108
Total time of execution	.234	-.001	-.140	.076	.050	.096
Total time of resolution	.279*	-.007	-.134	.039	.030	.069

Note: BP= Blood Pressure, CL= Total Cholesterol, BMI=Body Mass Index
Spearman r correlation coefficient *$p < .05$

Source: Research Data

adults with a BMI> 25 performed worse on the executive function test than normal-weight adults [66, 67], as well as in the global cognitive function [68].

In this sense, it would be possible to speculate that planning in the elderly could play an important role in meeting the goals of the SHT treatment, as well as in the observance to pharmacological and non-pharmacological SHT treatments. However, more studies are required to investigate with more accuracy the other activities of the executive functions and assess their interaction with respect to morbidities that are already very common in the elderly in the southern region of the state of Jalisco. Likewise, it should be considered that in the elderly the BMI will be affected by the reduction in the size and expansion of the curvature of the spine [69], for this reason it will be necessary to incorporate other parameters of nutritional measurement in order to determine with greater certainty the effect of poor nutrition on the cognitive function of the elderly.

The results of this research may be limited by the sample size, which reduces the statistical power to assess the correlation between the variables of study. It is also necessary to extend the follow-up of the participants to evaluate the planning behavior with respect to time, age, and nutritional status.

CONCLUSIONS

The elderly with the greatest difficulties in planning were the ones who presented the highest noncompliance toward the SHT treatment and specifically toward BMI, thus, this highlights an area of opportunity that nursing professionals have to support the elderly regarding the change of their lifestyle and compliance with the SHT treatment target, based on global and multidisciplinary care involving adherence to pharmacological and non-pharmacological treatments addressed to this pathology. Likewise, the need to redouble efforts to reduce the presence of modifiable risk factors in the elderly with SHT is highlighted, and, therefore, maintain the activity of the executive functions and specifically that of planning.

CONFLICTS OF INTERESTS

The authors stated they do not have any conflict of interest.

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