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Lifestyle-associated health literacy in subjects with systemic arterial hypertension in a first-level unit

Abstract

Introduction: Various factors can influence the control of systemic arterial hypertension (SAH), one of the most widely demonstrated is lifestyle. The impact that various behavioral and psychological conditions can have on lifestyle has not been fully established, as is the case of Health Literacy, whose study is limited.

Objective: To associate the degree of health and lifestyle literacy in subjects with systemic arterial hypertension (SAH).

Material and methods: Observational, analytical, and cross-sectional study. During the period from November 2022 to November 2023 in a first-level care unit. The following questionnaires were applied: *European Health Literacy Survey Questionnaire* (HLS-EU-Q16) and the Fantastic Lifestyle Test. Single and multiple Prevalence Odds Ratios (PMRs) were calculated using a Multiple Logistic Regression (RLM) model. The multivariate model included: health literacy, male gender and basic schooling.

Results: Of 424 subjects, 79.2% were women, with a median age of 48 years, with interquartile ranges (IQR) of 40 to 52 years. In the multivariate model, inadequate health literacy presented a PMR of 17.86 with a 95% CI (9.50-33.58), the male gender a WMR of 1.99 with a 95% CI (1.07-3.71) and basic schooling a WMR of 2.61 with a 95% CI (1.28-5.30).

Conclusion: Inadequate literacy is a risk factor for an unhealthy lifestyle in subjects with SAH, in simple and adjusted analysis. Prospective cohort studies are required that can verify the findings shown here.

Keywords: systemic arterial hypertension, lifestyle, health literacy, first level of care

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Abbreviations: SAH, systemic arterial hypertension; PMR, odds ratio of prevalence; RLM, multiple logistic regression, IQR, interquartile ranges; HLS-EU-Q16, European health literacy survey questionnaire; WHO, world health organization; IMSS, Mexican institute of social security; WHO, world health organization; IMSS, Mexican social security institute; ENSANUT, national health and nutrition survey; NYHA, New York heart association; UMF, family medicine unit; SPSS, statistical package for the social sciences; JNC8, eighth joint national committee; SPSS, statistical package for the social sciences; DN, normal distribution

Introduction

Systemic arterial hypertension (SAH) is the leading cause of death worldwide, it is considered by the World Health Organization (WHO) as one of the main risk factors for cardiovascular accidents. Based on the Eighth Joint National Committee (JNC8), SAH is defined in those subjects < 60 years of age as blood pressure ≥ 140/90 mmHg and in those > 60 years of age with blood pressure ≥ 150/90.[1] The complications generated by this pathology are the cause of 9.4 million deaths each year. In Mexico, results from the National Health and Nutrition Survey (ENSANUT) 2022 report a prevalence in adults over 20 years of age of 27.7% in women and 31.3% in men.[2]

There are multiple risk and control factors involved in SAH. Most of them are modifiable, within these we find lifestyle, which are patterns of behavior or actions related to attitudes, values and behaviors throughout life. These behaviors can be healthy or harmful to health.[2,3] Globally, in 2017, it was estimated that unhealthy lifestyles account for more than 23 million deaths and 36.5% of disability-adjusted life years.[4] It has been shown that subjects with worse lifestyles show hypertensive lack of control, on the contrary, subjects who performed active exercise, a balanced diet, adequate sleep habits and fewer episodes of stress were in control.[5]

The WHO defines health literacy as the social and cognitive skills that determine a person's level of motivation and ability to access, understand and use information to promote and maintain good health.[7] Health literacy implies that subjects can participate in decision-making regarding their health and self-care in a satisfactory way.[8,9] Health literacy requires the knowledge, skills, abilities, and autonomy of a subject in making decisions about his or her health. Decisions that are not only personal, but also related to their environment. Reflecting the skills it has to be able to move in a health and public health field. It also implies knowing how to access care if necessary and being able to share the activities learned with others.[8,9] Halladay et al. conducted an educational intervention to improve health literacy in subjects with uncontrolled SAH. Finding a reduction in blood pressure levels after the intervention. No significant difference was demonstrated between the group with inadequate and satisfactory health literacy.[10]

The Mexican Social Security Institute (IMSS), which is the largest institution that provides social security in Latin America, does not consider health literacy and its impact on the lifestyle of subjects with

SAH as part of its health care, promotion and prevention policies.[11] Therefore, health literacy may have an impact on improving the lifestyles of subjects with SAH. Thus, creating areas of opportunity in which both health personnel and patients can intervene in order to maintain and improve their health.

Material and methods

Type of study and objective

An observational, analytical, and cross-sectional study was conducted from January to November 2023. The main objective was to associate the degree of health and lifestyle literacy in adults with SAH.

Subject

The sample size was calculated using a calculator from the Clinical Epidemiology and Biostatistics Unit of the A. Coruña University Hospital Complex.[12] A comparison of two proportions was made, an alpha of 0.05%, a statistical power of 80%. With a prevalence of 38% (unhealthy lifestyle with adequate literacy) and a prevalence of 51% (unhealthy lifestyle with inadequate literacy) obtaining a sample size of 424 subjects.[13] Considering a 1:1 ratio. The sampling technique was non-probabilistic by quotas. Subjects aged 25-55 years with a diagnosis of SAH, male and female, were included. Subjects with a diagnosis of New York Heart Association *(NYHA) Functional Class Congestive Heart Failure IV and whose underlying chronic disease had dependence on supplemental oxygen* were excluded.

Ethical issues and consent

The present study was approved by the Research Ethics Committee 14088 and Local Health Research Committee 1408, obtaining the registration number R-2022-1408-040. Subjects who came to the Family Medicine Unit No. 64 "Tequesquináhuac" spontaneously or by appointment every month for the control and follow-up of their chronic condition were taken as participants. Previously, the subjects were informed of the details of the study, the main objective and the questionnaires used.

Statistics

The statistical analysis was performed with the SPSS version 27 (*Statistical Package for the Social Sciences) program.* For qualitative variables (lifestyle, level of health literacy, gender and schooling) frequencies and percentages were obtained. For the quantitative variables (age), their type of distribution was determined using shape criteria such as asymmetry (-0.05-0.05), kurtosis (-0.02-0.02) and statistical criterion using the *Kolmogorov-Smirnov test,* considering a $p > 0.05$ as a normal distribution (DN). In the case of free distribution, median and interquartile ranges (IQR) were used 25.75.

In the bivariate phase, for the association of qualitative variables (lifestyle, health literacy, gender and schooling) the non-parametric statistical Pearson's Chi-square test or Linear Trend Test was used, according to the corresponding assumption and was considered as statistically significant with a $p < 0.05$.

A multiple binary logistic regression model was performed, taking as possible confounding factors that impact lifestyle (age over 40 years, male gender, and basic schooling). Scientific soundness, biological plausibility and statistical significance were considered. To assess clinical relevance, simple and adjusted PMR were calculated, with 95% CI and *p*. The results were represented using a Forest Graph using *GraphPad Software,* LLC, 2365 Northside Dr., Suite 560, San Diego, CA 92108, USA.

Results

Descriptive results

Of the 424 subjects, 336 (79.2%) were women; the median age was 48 years (40.52) and 49.8% had secondary education. The degree of health literacy was inadequate in 50.7% and unhealthy lifestyle in 31.1% (Table 1).

Table 1 Baseline characteristics of subjects with SAH

General variable	n (%) = 424
Gender	
Female	336 (79.2)
Male	88 (20.8)
Age, Median IQR (25.75)	48 (40,52)
Schooling	
Primary	118(27.8)
High school	211(49.8)
High school	78(18.4)
Undergraduate	12(2.8)
Graduate	5(1.2)
Lifestyle	
Healthy	292(68.9)
Unhealthy	132(31.1)
Health literacy	
Enough	209(49.3)
Inadequate	215(50.7)

N, frequency; %, percentage; IQR, interquartile ranges

Bivariate results

The baseline characteristics of the subjects were contrasted with health literacy. It was found that the degree of inadequate health literacy was 50.3% in women. The median age was 48 years and 49.8% had secondary schooling (Table 2).

The initial characteristics of the subjects were contrasted with lifestyle. A healthy lifestyle of 56.4% was found in women. The median age for a healthy lifestyle was 48 years and for an unhealthy lifestyle was 49 years, and secondary schooling was 32.3% in the healthy lifestyle group (Table 3).

Bivariate result of the main objective

The association of lifestyle and health literacy presented a PMR of 18.68 with 95% CI (10.03-34.82) with a $p < 0.05$ (Table 4). Within the multivariate analysis, health literacy presented a PROM of 17.86 with 95% CI (9.50-33.58); males had a WMR of 1.99 with a 95% CI (1.07-3.71) and basic education had a WMR of 2.61 with a 95% CI (1.28-5.30) (Table 5, Figure 1).

Table 2 Characteristics of subjects with SAH with health literacy

General Variable	Sufficient health literacy n=209	Inadequate health literacy n=215	*p*
Gender			
Woman	167(49.7)	169(50.3)	0.74[(2)]
Man	42(47.7)	46(52.3)	
Age, median, IQR (25.75), years	48 (40,52)	48(40,52)	0.98[(1)]
Schooling			
Primary	48(11.3)	70(16.5)	<0.05[(3)]
High school	99(23.3)	112(26.4)	
High school	48(11.3)	30 (7.1)	
Undergraduate	10(2.4)	2(0.5)	
Graduate	4(0.9)	1(0.2)	
Lifestyle			
Healthy	196(46.2)	96(22.6)	<0.05[(z)]
Unhealthy	13(3.1)	119(28.1)	

N, frequency; (%), percentage; IQR, intercuantiles ranges; [(1)] Mann-Whitney U; [(2)] Pearson's Chi-Square; [(3)] Linear Trend Test

Table 3 Lifestyle characteristics of subjects with SAH

General variable	Healthy lifestyle n=292	Unhealthy lifestyle n=132	*p*
Gender			
Female	239(56.4)	97(22.9)	0.49[(2)]
Male	53(12.5)	35(8.3)	
Age, median, IQR (25.75), years	48 (40,52.75)	49(41,52)	0.97[(1)]
Schooling			
Primary	73(17.2)	45(10.6)	<0.05[(3)]
High school	137(32.3)	74(17.5)	
High school	65(15.3)	13(3.1)	
Undergraduate	12(2.8)	0(0)	
Graduate	5(1.2)	0(0)	
Health literacy			
Enough			
Inadequate	196(46.2)	96(22.6)	<0.05[(2)]
	13(3.1)	119(28.1)	

N, frequency; (%), percentage; IQR, interquantile ranges; [(1)] Mann-Whitney U; [(2)] Pearson's Chi-Square; [(3)] Linear Trend Test

Table 4 Association between health and lifestyle literacy level

Health literacy	Lifestyle		*p*	PMR with 95% CI
	Unhealthy n (%) =132	Healthy n (%) =132	<0.05	18.68
Inadequate n (%)=215	119 (28.1)	96 (22.6)		(10.03-34.82)
Sufficient n(%)=209	13 (3.1%)	196 (46.2)		

RMP, prevalence odds ratio; CI, confidence interval

Table 5 Simple and multivariate logistic regression of risk factors for an unhealthy lifestyle

Variables	RMPA	95% CI	p	B*	USA**	RMPB	95% CI	*p*
MALE	1.62	0.99-2.65	0.05	0.69	0.31	1.99	1.07-3.71	<0.05
BASIC SCHOOLING	3.57	1.91-6.69	<0.05	0.95	0.36	2.61	1.28-5.30	<0.05
INADEQUATE HEALTH LITERACY	18.68	10.03-34.82	<0.05	2.88	0.32	17.86	9.50-33.58	<0.05

[a]Simple logistic regression; [b] Multivariate logistic regression; *Beta exponential; **Standard error; RMP: Odds Ratio to Prevalence

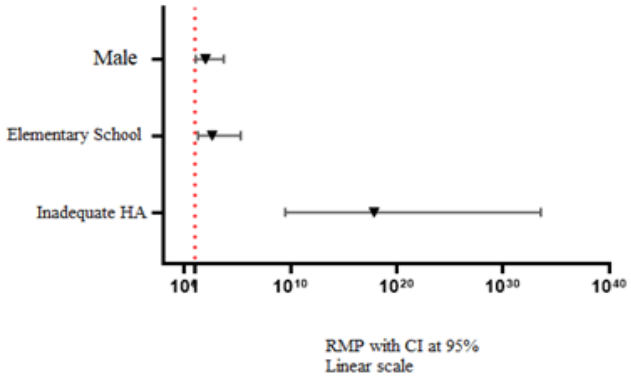

Figure 1 Risk factors for an unhealthy lifestyle. Multivariate analysis.

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Discussion

The purpose of this research was to associate health literacy and lifestyle in subjects with SAH. From the demographic point of view, the present study found that the subjects had a median age of 48 years. This phenomenon can be explained by a higher prevalence of SAH as age increases due to changes in the heart, vascular system and autonomic nervous system that cause inflammation and vascular rigidity.[14] Results converging with the ENSANUT 2022, where a trend of greater growth in prevalence was observed at older age. It is higher in adults >60 years old than in adults aged 20-29 years.[1]

In the present research, the female gender predominated. The prevalence in terms of gender can be explained by hormonal factors such as the presence of 17-estradiol in premenopausal women that serves as a protective factor, psychosocial factors, tobacco consumption and chromosomal differences. β [15] Romero et al. [16] found that the factors related to SAH were male gender, adulthood, primary education level, overweight and obesity, as well as associated chronic diseases. As in the present study, Hernández et al. [5] found a predominance of the female gender and primary schooling.

In this study, an inadequate predominance of health literacy was found. Health literacy is indirectly influenced by a number of factors that contribute to its inadequacy.[17] Clinical research found that older age and less schooling are associated with lower communication skills, poor access to sources of information either due to ignorance, inappropriate access or use, the presence of diseases that hinder self-care, and social situations that cause less attendance at health centers.[18,19]

Jared et al.[20] concluded that health literacy is strongly related to social determinants. In this sense, factors such as male gender, age > 65 years and schooling are mentioned. The latter is positively related to university education and satisfactory literacy. The result obtained in the present study is convergent with the findings of Da Costa et al. [21] who demonstrated that factors such as age, education, knowledge of diseases, socioeconomic level, and the presence of comorbidities are associated with inadequate health literacy.

In the present research, a predominance of a healthy lifestyle was found. The foregoing, as a descriptive result and not associated with any variable. Lifestyle does not depend only on personal decision, the environment also intervenes, social, economic, cultural and ideological factors can modify it.[22] The changes of aging can affect nutrition and physical activity, due to a decrease in saliva or loss of teeth and muscle mass. A higher level of education means greater awareness of the importance of healthy habits.[23] An educational program was carried out for lifestyle modification in subjects with uncontrolled SAH, finding better healthy lifestyles in the intervention group.[24]

Regarding the main objective, it was found that the degree of inadequate health literacy is a risk factor for an unhealthy lifestyle in subjects with SAH in the simple and multivariate model. When you have a satisfactory level of health literacy, you can access basic health services, properly understand information, and participate in health decision-making. This generates the adoption of healthy lifestyles.[20] These results are similar to those found by Asharani et al.,[25] where subjects with adequate health literacy had chronic disease control.

Based on the above, inadequate health literacy associated with an unhealthy lifestyle generates hypertensive uncontrol in subjects with SAH. Given that literacy involves decision-making and self-care,[8,9] when it is inadequate as in this work; As well as, the altered patterns of behavior and actions towards the disease impact the lack of control of blood pressure levels.[3,4] This is consistent with Magnani and collaborators,[22] who highlight the importance of autonomy and behavioral patterns in patients with cardiovascular and chronic diseases, demonstrating that these conditions contribute to better management of SAH and other cardiovascular conditions.

This study has the limitation that, being a cross-sectional study, it cannot measure the cause-effect phenomenon exactly, between the inadequate degree of health literacy and the unhealthy lifestyle in subjects with SAH, so longitudinal studies are required *a* posteriori. A strength of the present work is the obtaining of measures of clinical relevance and probability of risk with a simple and multivariate analysis. The findings can be extrapolated to the Mexican population with characteristics similar to those of this study, in terms of SAH, age, gender, education, and sociodemographic characteristics.

Conclusion

Inadequate health literacy is a risk factor for an unhealthy lifestyle in subjects with SAH. Additional prospective cohort studies are required to verify the findings shown here and the cause-and-effect phenomenon between health literacy and lifestyle; allowing the generation of new intervention strategies at the local and delegation level in subjects with this pathology.

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Conflicts of interest

The authors declare that they have no conflict of interest.

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