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RELIGIOSITY, BIOLOGICAL MARKERS AND HEALTH-RELATED QUALITY OF LIFE IN PATIENTS WITH HYPERTENSION

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ABSTRACT

Motivation/Background: the adoption of a healthy lifestyle has a positive influence on the control of hypertension. Objective: The objective of this study was to analyze the effect of Spirituality and Health Workshops on biological markers and Health-Related Quality of Life of hypertensive patients. Method: This is a randomized controlled trial study in which an educational intervention was carried out and the religiosity and Quality of Life indices as well as the blood pressure and, Cortisol, C-Reactive Protein (CRP) and cholesterol were evaluated. Results: The intervention group experienced a lower diastolic pressure ($p < 0.05$). There were no differences between intervention and control groups on systolic blood pressure, quality of life, somatic manifestations, mental state, CRP, and cholesterol levels. Conclusions: It was concluded that the intervention positively influenced the results, at least in one of the biological markers and the quality of life of this group.

Keywords: Religion, Spirituality, Hypertension, Quality of Life, Biomarkers

1. INTRODUCTION

Cardiovascular diseases account for 30% of the world's deaths, being one of its main causes. In 2015, 17.7 million people died from these diseases, according to the World Health Organization World Health Organization (2017). The main risk factors are hypertension, smoking, hyperglycemia, sedentary lifestyle, obesity, and excess alcohol World Health Organization (2014).

Systemic Arterial Hypertension (SAH) favors the development of arteriosclerosis, acute myocardial infarction, cerebrovascular accident, heart failure, and renal failure Barroso et al. (2020). It affects approximately 30% of adults and causes 9.4 million deaths per year World Health Organization (WHO). (2013), Silva et al. (2012).

In Brazil, there are approximately 36 million people with hypertension, above 18 years of age Fontes et al. (2018). The women are the most affected Brasil (2014a). It is estimated that by 2025, about 1.5 billion individuals around the world will have high blood pressure (> 140/90 mmHg) Silva et al. (2016a).

Cardiovascular disease results in morbidity and mortality due to the high prevalence of atherosclerosis, with associated thrombosis and arterial stenosis Póvoa (2018). Atherosclerosis is characterized by an accumulation of Low-Density Lipoproteins (LDL) inside the artery that undergoes oxidation and causes lesions in the arterial wall Póvoa et al.(2018), Raman et al. (2013). There is a relationship between the levels of biomarkers and the risk of cardiovascular diseases (CVD) Spinelli (2018). Inflammation plays a significant role in the stages of atherosclerosis, justifying a more active research area aimed at the characterization of biomarkers associated with cardiovascular risks Raman et al. (2013), Chong and Akhtar-Danesh (2013).

Hypertension has been attributed to disorders of the renal vasculature and central nervous system Fontes et al. (2018). It has been shown that immune cells contribute to this disease due to the accumulation of macrophages and "T cells" in the kidney and in the vasculature of the hypertensive organism, which may imply possible damages to the Health-Related Quality of Life (HRQoL) Harrison et al. (2014).

HRQoL is conceptualized as the broad assessment of health and how it relates to the positive and negative aspects of human life. For this reason, individuals with the same morbidity present different levels of health and physical and emotional well-being Noronha et al. (2016).

It is fundamental to adopt strategic actions for improving the quality of life and health indicators of patients. Abdala et al. (2015). mentions that intrinsic religiosity (IR) favours the quality of physical and mental health, indicating the importance of integral care by health professionals through interventions and improvements in communication in this sense.

Religiousness / spirituality can function as a coping factor for stress caused by illness. In an intervention study, involving spirituality, Abdala et al. (2011). perceived a decrease in blood pressure (BP), reducing the stress, which is a risk factor for the development of cardiovascular diseases.

Religion is defined as a system of “beliefs and practices related to the Transcendent. In Western traditions, the Transcendent may be called God, Allah, HaShem, or a Higher Power”. In Eastern traditions, the Transcendent may be called Vishnu, Lord Krishnan, Buddha, or the Ultimate Reality. Religion can be structured in a community or outside it, and it is usually practiced in a public setting Koenig (2015).

Spirituality, in turn, is the individual quest to understand the purpose of life. It is expressed by the bond with something divine or by the study of the transcendent, by the relationship with people, with nature, art or with thoughts Koenig (2015), Koenig et al. (2012).

By introducing a behavioural strategy, through the Spirituality and Health Workshops (SHW), this study aimed to investigate the effect of this intervention on

the control of certain biomarkers whose level and characteristics predict cardiovascular diseases. One study stated that a minimal decrease of 1 - 4 mmHg in blood pressure would result in a 10-20% reduction of cardiovascular diseases Koenig et al. (1998).

This article reports a study that investigated the effect of an educational intervention on the control of biomarkers and possible associations between the analysed variables.

2. MATERIALS AND METHODS

Randomized controlled trial study, documented in the Brazilian Registry of Clinical Trials (Registro Brasileiro de Ensaios Clínicos - ReBEC) under number RBR-75kj6t, UTN: U1111-1224-6791, approved by the Adventist University of São Paulo, São Paulo, SP, Brazil (UNASP / SP) Committee of Ethics in Research, number 605.568-0.

A total of 14 patients with hypertension enrolled in one of the Family Health Units (USF) located in the South Zone of São Paulo, Brazil, participated in this study, and all of them signed the informed consent. Participants were selected among those who answered the questionnaires applied in the first phase of the research that preceded the educational intervention, being randomly divided into Control Group (CG) with seven participants, and Intervention Group (IG), with seven participants.

Only those that had been diagnosed with Systemic Arterial Hypertension (SAH) without comorbidities and under regular medical follow-up were selected. Only hypertensive individuals over 18 years of age without cognitive impairment participated in this study. Before and after the "workshops" strategy, two questionnaires were applied: Duke-Durel Index of Religiosity developed by Koenig and Büssing (2010), validated in Brazil Taunay et al. (2012). and the Mini-Questionnaire of Quality of Life in Hypertension (MINICHAL-BRASIL), created in Spain in 2001, validated in Brazil by Schulz et al. (2008).

The eight workshops addressed healthy lifestyle topics and occurred once a week in the months of May and June 2016. Each session/workshop had a duration of two hours. The topics consisted of practical guidelines on healthy habits related to the so-called "Eight Natural Remedies": clean air, sunlight, physical exercise, abstinence / temperance, sleep and rest, healthy eating, water, and trust in God White (1905). Other studies have reported better health scores in the biomarkers, using the same type of intervention Alves (2016), Queiroz at al. (2020).

At the beginning of the workshops, 10 minutes were dedicated to spiritual reflection on the "Jacob's Journey", described in the handbook developed by Abdala et al. (2020), Meira and Teixeira (2020).

It is noteworthy that the CG participants did not undergo any intervention involving social interaction, they only received guidance on the importance of adopting healthy habits at the time of data collection. It is also worth informing that the participants of the control group and other patients received, at the end of the research, a same PDF version of the guidelines on the workshops given to the IG.

The sociodemographic variables recorded were age, sex, self-reported skin colour, religion, and years of education. The following health data were evaluated before and after the workshops: blood pressure (BP), dosage of biomarkers C-Reactive Protein (CRP), total cholesterol, cortisol, weight, and height for

calculating Body Mass Index (BMI), the use of antihypertensive drugs by participants, and self-perception of quality of life.

Descriptive and analytical statistics were calculated, using the SPSS software for Windows, version 22. Before and after the intervention, the Mann Whitney test was used to compare averages, based on the values obtained, by combining the two independent samples of equal sizes. In the analytical statistic, the Spearman correlation (using the Spearman Coefficient = rho) was applied to determine the association between Organizational Religious Activity (ORA), Non-Organizational Religious Activity (NORA), and Intrinsic Religiosity (IR) on the one hand, and on the other hand, the variables age, years with SAH, number of medicines taken, biological markers and data from the MINICHAL Health-Related Quality of Life test.

3. RESULTS AND DISCUSSIONS

In regard with the sociodemographic profile of hypertensive patients who participated in the study, the data showed that the average ageing in the IG was 66 (SD= ± 10.6), and in the CG was 53 (SD= ± 9.7). The female gender predominated in both groups. In the interventional group, 100% were women and 85,7% in the CG.

In the present study, most of the participants in both groups were women, with an average of 66 years (± 10,6) in the IG and 53 (± 9,6) in the CG. In both groups, the average of education was 1-8 years of studies. The Ministry of Health of Brazil clarifies that, the hypertension disease is related to age, and that women have more than a 50,3% chance of developing it after age 55. In the country, about 38% of women diagnosed with hypertension have up to eight years of education, while only 14.6% of them attended more than 12 years of study Malta et al. (2017).

Considering educational level, in the control group, the average number of individuals with more than nine years of education was 42.9%, and in the IG 28.6%. However, more than half of the participants (control = 57.1%, intervention = 71.4%) reported having minimal years of education in both groups (1 - 8 years of study).

Silva (2012). corroborates this information and add that lower education has a negative influence on the adoption of healthy habits and the treatment of cardiovascular diseases.

In both groups, most of the participants were Catholic, which means 85.7% in the CG and 57.1% in the IG. The others were evangelicals, 14.3% in the CG and 42.9% in the IG.

All study participants professed a religion in the present study. IBGE data indicates that only 8% of Brazilians report having no religion Brazilian Institute of Geography and Statistics (2013). This fact alone would be enough to justify the need to include and value the dimension of religiosity / spirituality in health work. Apart from this, Raddatz et al. (2019). reiterate this necessity by explaining that people usually look for answers to their problems and reasons to live. Besides, they seek relief when suffering. In this way, religiosity / spirituality becomes an approach that many consider valid in certain circumstances involving different disease or health conditions.

Regarding BMI, according to Table 1, all hypertensive individuals were overweight (> 30). After the educational intervention, the IG presented a minimal reduction (from 30.15 to 30.12) but not statistically significant. Concerning “sleeping hours” and water intake, the IG presented better results after the workshops by comparison with the CG, but without statistical significance Table 1.

Table 1

Table 1 BMI, Sleeping Hours, Water Intake and Quality of Life Data of Hypertensive Patients of the Control and Intervention Groups, Before and After the Intervention (P> 0.05). São Paulo, 2017

Variables		Control Group (n= 7)		Intervention Group (n= 7)	
		Before	After	Before	After
BMI (mean, SD)		31. 28 (2.8)	31.38 (3.1)	30.15 (5.3)	30.12 (5.3)
Sleeping hours (mean, SD)		6.6 (1.1)	5,6 (1.9)	6.6 (1.8)	7.3 (0.9)
Water intake (200 ml, mean, SD)		5.7 (3.5)	5,9 (2.8)	5.5 (1.9)	6.9 (1.1)
Quality of life	No, absolutely,	3 (42.9%)	5 (71.4%)	4 (57.1%)	6 (85.7%)
being affected	Yes, a little	4 (57.1%)	2 (28.6%)	2 (28.6%)	0 (0%)
(n, %)	Yes, a lot	0 (0%)	0 (0%)	1 (14.3%)	1 (14.3)

Source: Own elaboration.

Note: SD – Standard Deviation, BMI – Body Mass Index.

Among the main risk factors associated with arterial hypertension, obstructive sleep apnea stands out, usually associated with obesity and other pathophysiological mechanisms linked to lifestyle Barroso et al. (2020). A recent population-based study conducted with 65,643 Brazilian adolescents assessed the relation between sleep duration and blood pressure and found a significant association between shorter sleep duration and higher blood pressure, especially in boys. Besides, for both sexes, among the individuals of older age, the BP was higher Santos and Souza (2020).

After actions of this study, there was also an improvement of water intake for the IG. In order to be healthy, it is important to maintain hydration of tissues, since water corresponds to 75% of the body Brasil (2014b). and it should be ingested daily on average, 35-40 ml / kg body weight Gandy (2015). Water intake is even more essential considering that the amount of water available in food varies according to the type of product, which might also vary from one region to another Gandy (2015).

The results of the duke-Durel questionnaire were presented separately, according to their dimensions: ORA, NORA, and IR 1, 2, and 3. The ORA in the CG did not change before or after the research but, for the individuals in the IG, the attendance to the religious gatherings reached 71,4% (from “once per week” to “more than once per week”). The NORA has not changed either. Both groups stayed same without any influence from the intervention. Regarding the IR, in all questions (from IR1 to IR3), it was found that the religiosity reached more people in the IG after the intervention, compared to the CG Table 2

Table 2

Table 2 Absolute and relative frequency of religious variables before and after workshops, São Paulo, Brazil

Variable	Categories	Control Group (n= 7)				Intervention Group (n= 7)			
		Before		After		Before		After	
		(n)	(%)	(n)	(%)	(n)	(%)	(n)	(%)
ORA	More than once a week	2	28.6	2	28.6	1	14.3	1	14.3

	Once a week	1	14.3	1	14.3	2	28.6	4	57.1
NORA	More than once a day	0	0	2	28.6	2	28.6	2	28.6
	Daily	4	57.1	1	14.3	3	42.9	2	28.6
	2 or + times per week	1	14.3	1	14.3	2	28.6	2	28.6
IR1	Totally true for me	7	100	6	85.7	6	85.7	7	100
IR2	Totally true for me	6	85.7	4	57.1	5	71.4	7	100
IR3	Totally true for me	5	71.4	3	42,9	5	71.4	6	85.7
	In general, is true	2	28.6	4	57.1	1	14.3	1	14.3

Source: Own elaboration.

Note: ORA = Organizational Religious Activity (attendance to religious gatherings), NORA = Non-Organizational Religious Activity (particular religious / spiritual practices), IR1 = Intrinsic religiosity, feels the presence of God or the Holy Spirit, IR2 = Intrinsic religiosity, my beliefs are behind my way of living, IR3 = Intrinsic religiosity, I strive to live my religion in all aspects of life.

In order to observe the association between ORA, NORA, IR, and the other variables studied in these groups (age, time of hypertension, amount of medications used, biological markers, and quality of life), it was taken some tests. By the Spearman correlation test for non-parametric samples, a significant association was found between NORA and age (rho = 0.374, p = 0.038), that is, the more advanced the age, the more frequent the practice of particular religious activities.

This study showed that there was a relationship between intrinsic religiosity and age for 100% of the participants in the IG, compared to the CG. They reported better results on “felt the presence of God / Holy Spirit”, “strived to integrate their religion into all aspects of life” and “demonstrated religion in their way of living”.

Besides, there was an association statistically significant (p= 0.038) between Non-Organizational Religious Activity (NORA) and age. This finding corroborates those of Abdala (2015). which explored the direct and indirect effects of religiosity variables on the quality of life of elderly individuals and found positive association between them.

Table 3 presents the mean and standard deviation values of the results found regarding initial and final systolic blood pressure (SBP) and diastolic blood pressure (DBP) in both the CG and IG. BP is considered one of the main risk factors for cardiovascular diseases and it is classified as: normotensive (systolic <130 mmHg and diastolic <85 mmHg), borderline (systolic 130 - 139 MmHg and diastolic 85 - 89 mmHg), or stage 1 arterial hypertension (systolic 140 - 159 and diastolic 90 - 99 mmHg), stage 2 (systolic 160 - 179 mmHg and diastolic 100 - 109 mmHg), and stage 3 (systolic ≥ 180 and diastolic ≥ 110) Barroso (2020), Précoma (2019).

The Guideline of The American College of Cardiology for the prevention, detection, evaluation and management of hypertension has defined lower scores due to the higher number of cardiovascular diseases classified as: normal (Systolic <120 mm Hg and diastolic <80 mm Hg), elevated (Systolic = 120-190 mmHg and diastolic < 80 mm Hg), hypertension stage 1 (Systolic = 130=139 mm Hg or diastolic = 80-89 mm Hg), and stage 2 (Systolic ⍰ 140 mm Hg or diastolic ⍰ 90 mm Hg) Whelton et al. (2018). p. 3-21).

The IG, although it was always reported as being in hypertension stage 1, it presented reduction values, after the intervention, both systolic and diastolic blood (about 2 mmHg in each). There was a noticeable statistical difference (Man Whitney test) between the final diastolic pressures of hypertensive patients (p =

0.038), that is, the IG presented lower diastolic pressure in relation to the CG. When comparing the final mental status scores in relation to the somatic manifestations of the IG, there was an exponential improvement of mental state after the workshops (from 9.14 to 4.14) Table 3.

Regarding the biological markers analysed, considering the means of cortisol, CRP, and cholesterol obtained in the Mann-Whitney test, none of them presented statistical significance (p> 0.05). In the IG, after the workshops, there was improvement in total cholesterol levels, despite the non-statistical significance Table 3.

Table 3

Table 3 Mean, Standard deviation p value of the dimensions of the Quality-of-Life MINICHAL of the control and intervention group of hypertensive patients before and after the workshops. São Paulo, 2017

Scores	Control (n= 7)		intervention (n= 7)		Mann Whitney (*p value*)	
	Before	After	Before	After	Control	intervention
SBP	135.9 (18.52)	151.0 (19.17)	147.4 (30.91)	145.6 (29.88)	0.456	0.62
DBP	83.29 (14.29)	90.86 (7.99)	75.14 (11.23)	73.29 (12.91)	0.259	**0.038**
SM	6.00 (3.69)	3.85 (2.79)	9.14 (6.14)	4.14 (3.43)	0.318	0.902
MS	3.28 (3.81)	4.28 (2.87)	2.86 (2.67)	2.71 (3.14)	1	0.318
Cortisol	19.69 (6.37)	22.21 (9.65)	18.02 (3.15)	18.25 (2.33)	0.165	0.5
CRP	6.88 (11.55)	2.05 (1.43)	2.70 (4.02)	7.42 (8.83)	0.078	0.5
Total Cholesterol	217 (40.35)	193 (35.75)	200.40 (33.36)	185.40 (28.92)	0.229	0.345

Source: Own elaboration.

Note: SBP- Systolic Blood Pressure, DBP- Diastolic Blood Pressure, SM = Somatic Manifestations, MS = Mental State, CRP= C-reactive Protein.

In the present study, the IG presented higher pressure values before the intervention in comparison to the CG. The study showed that, in the IG, the results improved after Spirituality Health Workshops (SHW), especially in the reduction of diastolic blood pressure (p = 0.038). Other authors have found similar results, such as Backes (2012), Silva (2016b), and Shattuck and Muehlenbein (2018). who found that spirituality have a positive effect on the hypertensive blood pressure, an activity that can be considered as a form of integral care to the patient.

For this reason, Abdala (2015). defend the importance of SHW, especially those that promote healthy habits related to the eight natural remedies aforementioned, especially in groups of patients with SAH, because the emphasis on spirituality makes possible the improvement of their integral health.

According to the MINICHAL questionnaire applied before and after the intervention, both groups showed improvement in mental health after the workshops, especially the group that participated in the educational intervention. Regarding the somatic manifestations, the IG had a mean reduction (the lower, the better) while in the CG there was an increase.

As for the quality of life for hypertensive patients, a marked improvement in mental state was observed among the individuals in the control group, although it was not statistically significant (p> 0.05). A similar result was reported by Alves (2016). in whose study an improvement of mental health was found after an intervention by means of SHW. However, this study also showed improvements in regard with the somatic manifestations of the respondents.

Religiousness and spirituality function as a protective factor in health promotion and disease prevention, apart from promoting quality of life Mishra (2015), Shattuck and Muehlenbein (2018).

3.1. STUDY LIMITATION SECTION

This study had as limitation the size of the sample, which hindered a more robust statistical analysis, hence the need to conduct other research, with larger samples, to evaluate the effects of behavioural interventions aimed at patients with hypertension. Another limitation was the lack of statistical significance between religion and the biological markers analysed, such as the means of cortisol, CRP and cholesterol.

After a scientific literature review about changing habits, it was noticed that "little empirical attention has been paid to the sustainability of habits over time" Gardner (2015). p. 290. However, in this article, Gardner cites some intervention over eight weeks for greater automaticity and behaviour gain and six months for losing weight with a habit-based diet and activity Gardner (2015). p. 290. Another researcher adopted three months for losing weight, with better results, instead of 24 months Beeken et al. (2017).

There is no way to assess, in this research excerpt, if the benefits were due solely to the workshop and the social interaction promoted during the meetings. However, in the unfolding of the qualitative phase of the research Silva et al. (2021). the participants stated that the group support influenced the adoption of healthy habits, but the perceived improvement in symptoms and general well-being was the factor that really motivated the consolidation of the new lifestyle adopted by them.

The control and intervention groups differed in several variables including age. Since our main finding relates to the DBP pre and post intervention in the IG then, that does not directly affect the validity of that finding.

4. CONCLUSIONS AND RECOMMENDATIONS

The study showed, through statistically significant results (p <0.05), that the Spiritual Health Workshops (SHW) helped to reach lower levels of diastolic blood pressure in patients with hypertension.

Age was associated with non-organizational religiosity, that is, older participants showed higher/stronger religious involvement (p = 0.038).

The participants actively involved in the workshops reported changes in their behaviour and testified to the positive influence of the Spirituality and Health Workshops on their physical, mental, and spiritual health.

Among other things, they reported improvements in the amount of water intake, dietary habits, quantity and quality of sleep, and physical exercise.

Once the impact of these behavioural interventions on the participants' health and quality of their life has been verified, it can be concluded that the adoption of a healthy lifestyle has a positive influence on the control of hypertension.

CONFLICT OF INTERESTS

All the authors declare that they have no conflict of interest.

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