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THE RELATIONSHIP OF HIGH BLOOD PRESSURE, ANXIETY AND STRESS: AN INTEGRATIVE LITERATURE REVIEW

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ABSTRACT. The objective of this study was to conduct an integrative literature review to verify which studies addressed the relationship between stress and anxiety in hypertensive patients. To do so, the study was carried out at the bases PsycINFO, Portal da Capes, Scielo and Medline BVS-PSI, using the descriptors 'arterial hypertension' and 'stress' and 'anxiety', and their correspondents in the English language 'arterial hypertension' and 'stress' and 'anxiety' and Spanish 'hypertension' and 'anxiety', considering the last six years (2013 to 2018). The results were grouped into three categories: a) The impact caused by the diagnosis of chronic non communicable diseases, b) Psychological factors associated with arterial hypertension and c) Deconstructing the dichotomy: physical health vs. mental health. The search resulted in the inclusion of 14 empirical studies. The results showed that anxiety and stress, in addition to depression, may present as modulatory aspects of arterial hypertension. Therefore, it is considered necessary the demystification of the cartesian logic between mind and body, so that actions of integral care of the subjects and promotion of health are carried out. It is hoped that the results obtained reaffirm the importance of considering the psychological and emotional aspects in chronic diseases, and that future studies with different designs be developed in the other areas of health, besides the medical area.

Keywords: Anxiety; stress; arterial hypertension.

A RELAÇÃO ENTRE HIPERTENSÃO ARTERIAL, ANSIEDADE E ESTRESSE: UMA REVISÃO INTEGRATIVA DA LITERATURA

RESUMO. Este estudo teve por objetivo realizar uma revisão integrativa de literatura para verificar o que os estudos têm abordado sobre a relação entre estresse e ansiedade em pessoas hipertensas. Para tanto, o levantamento dos estudos foi realizado nas bases PsycINFO, Portal da Capes, Scielo e Medline BVS-PSI, utilizando os descritores 'hipertensão arterial' *and* 'estresse' *and* 'ansiedade', e seus correspondentes na língua

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inglesa '*arterial hypertension*' *and* 'stress' *and* '*anxiety'* e espanhola '*hipertensión' and* '*estrés'* and '*ansiedad'*, considerando os últimos seis anos (2013 a 2018). Foram selecionados 14 estudos. Os resultados foram agrupados em três categorias: a) o impacto causado pelo diagnóstico de doenças crônicas não transmissíveis, b) fatores psicológicos associados à hipertensão arterial e c) relação saúde física *versus* saúde mental: uma questão também de método. Os resultados mostraram que ansiedade e estresse, além da depressão podem apresentar-se como aspectos moduladores da hipertensão arterial. Portanto, considera-se necessária a desmistificação da lógica cartesiana entre mente e corpo, para que sejam efetivadas ações de cuidado integral dos sujeitos e de promoção à saúde. Espera-se que os resultados obtidos reafirmem a importância de considerar os aspectos psicológicos e emocionais nas doenças crônicas e que estudos futuros com diferentes delineamentos sejam desenvolvidos na área da psicologia.

Palavras-chave: Ansiedade; estresse; hipertensão arterial.

LA RELACIÓN ENTRE HIPERTENSIÓN ARTERIAL, ANSIEDAD Y ESTRÉS: UNA REVISIÓN BIBLIOGRÁFICA INTEGRATIVA

RESUMEN. Este estudio tuvo como objetivo realizar una revisión bibliográfica integradora para verificar lo que los estudios han abordado sobre la relación entre estrés y ansiedad en personas hipertensas. Para ello, el levantamiento de los estudios fue realizado en las bases PsycINFO, Portal da Capes, Scielo y Medline BVS-PSI, utilizando los descriptores 'hipertensión arterial' y 'estrés' y 'ansiedad', y sus correspondientes en la lengua inglesa '*arterial hipertension*' y '*ansiedad'* y '*ansiedad'*, considerando los últimos seis años (2013 a 2018). Se seleccionaron 14 estudios. Los resultados fueron agrupados en tres categorías: a) el impacto causado por el diagnóstico de enfermedades crónicas no transmisibles, b) factores psicológicos asociados a la hipertensión arterial y c) Relación entre salud física y mental: una cuestión también de método. Los resultados mostraron que la ansiedad y el estrés, además de la depresión pueden presentarse como aspectos moduladores de la arterial hipertension. Por lo tanto, se considera necesaria la desmistificación de la lógica cartesiana entre mente y cuerpo, para que se efectúen acciones de cuidado integral de los sujetos y de promoción a la salud. Se espera que los resultados obtenidos reafirmen la importancia de considerar los aspectos psicológicos y emocionales en las enfermedades crónicas, y que estudios futuros con diferentes delineamientos se desarrollen en las demas áreas de salud, ademas del área médica.

Palabras clave: Ansiedad; el estrés; hipertención arterial.

Introduction

Chronic non communicable diseases (CNCDs) are considered a public health problem worldwide. Arterial Hypertension (AH) is one of the risk factors for the development of cardiovascular diseases, in addition to being an important co-responsible for the causes of death (Andrade et al., 2015). It is estimated that cardiovascular diseases are responsible for 33% deaths, being the leading cause of hospitalization in the public sector (Passos, Assis, & Barreto, 2006).

In view of this scenario, the Global NCD Action Plan established a goal of reducing AH by 25% between 2015 and 2025. In the Strategic Action Plan to tackle NCDs in Brazil 2011-2022, several health promotion measures and attention measures related to AH were defined: agreements with the food industry to reduce the sodium content in processed foods, encourage the practice of physical activity through the Academia da Saúde Program, and free availability of medicines to control AH according to risk classification (Andrade et al., 2015).

Likewise, one of the Sustainable Development Goals (SDGs) of the World Health Organization (WHO) is, by 2030, to reduce by one third premature mortality from chronic noncommunicable diseases through prevention and treatment, and to promote mental health and well-being of the population (World Health Organization [WHO], 2018).

According to the International Statistical Classification of Diseases and Related Health Problems (ICD-10), hypertensive heart disease comprises the following diagnoses: essential (primary) hypertension, which does not have well-defined causes; secondary hypertension, which has detectable and well-established causes; hypertensive heart disease; hypertensive kidney disease; and hypertensive heart and kidney disease (World Health Organization [WHO], 1995).

AH can be defined as the "[...] increase in blood pressure levels above what is recommended for a given age group and clinical condition" (Colombo & Plavnik, 2009, p. 250). In individuals over 18 years of age, AH is defined as the maintenance of blood pressure levels above 140 mmHg in systolic and 90 mmHg in diastolic (Colombo & Plavnik, 2009). It is noteworthy that the prevalence of AH increases with age (approximately 60 to 70% population over 70 years of age is hypertensive).

In 2013, the National Health Survey was developed, characterized as domiciliary from the Integrated System of Household Surveys (SIPD), of the Brazilian Institute of Geography and Statistics (IBGE), with the objective of knowing the distribution, magnitude, trend of chronic diseases, and their risk factors, as well as supporting public health promotion policies. The results showed that, of the total number of respondents, the prevalence of individuals who reported having at least one CNCD was 45.1%. Thus, it is considered that more than 66 million Brazilians have a previous diagnosis of some CNCD, in which hypertension was the most mentioned by respondents, with a prevalence of approximately 31 million individuals aged 18 years or more, especially women, with a total of 24.2% (Malta et al., 2015).

In the state of Paraíba, it is estimated that 963,000 adult inhabitants (35% population) have at least one CNCD, whose prevalence is centered on the female audience. AH leads the ranking in this state, drawing attention to the urgency and emergency of basic diagnostic and control actions at different levels of health care, primarily in primary care, since the quality of life and well-being of the population can be aggravated (Brasil, 2014).

AH is often associated with functional or structural changes in target organs and metabolic disorders, in which risk factors such as dyslipidemia, abdominal obesity and Diabetes mellitus can lead to aggravation of the disease (Brasil, 2011). Also, individual factors such as age, sex, ethnicity, genetics and lifestyle or behavioral factors such as excess weight, sodium and alcohol intake, sedentary lifestyle are determinants that substantially contribute to the increase these diseases (Malachias et al., 2016).

But it is important to highlight that the occurrence of these diseases can be influenced, above all, by living conditions and social inequalities, which implies that they will not always be the result of lifestyles alone (Malta et al., 2015). Accordingly, somatic and psychological

processes can also be mentioned, as the body, traversed by language, can be singularized as an event that allows the ventilation of senses, making its complexity and multiple possibilities visible (Henn & Machado, 2016).

Despite the prevalence of AH in the area of CNCDs and its potential risk to life, little attention has been given to the association of blood pressure with emotional factors (for example, stress and anxiety). Cohen, Edmondson and Kronish (2015) point out that emotional states, such as stress and anxiety, have shown connections with cardiovascular disease. From a neurobiological point of view, scientific evidence points to the relationship between the functioning of the sympathetic nervous system (SNS), emotions and arterial hypertension (Fonseca, Coelho, Nicolato, Malloy-Diniz, & da Silva Filho, 2009). This is because it has been observed that there are hypertensions involving the nervous system and others that are totally independent of it (Campos Júnior, Colombari, Cravo, & Lopes, 2001).

Conceptually, stress can be defined as a process of perception and response to events or stimuli (stressors) that cause emotional excitement in individuals. The stress process will be triggered when the personal and social resources that the individual has to face a stressful situation are exceeded; without satisfactory coping resources, stress will persist, causing consequences for the subject, for example, memory loss, mental fatigue, difficulty concentrating, and triggering anxiety and mood crises (Straub, 2014).

Authors consider that, in people with AH, such damage is due to cardiovascular reactivity, which occurs in response to a specific situation or event, given in an exacerbated way when compared to those who do not have this comorbidity, as the natural adaptation of arteries favors the recovery of the organism without causing sequelae (Moxotó & Malagris, 2015).

Accordingly, anxiety is considered a "[...] global and future-oriented response that involves both cognitive and emotional components, as the individual becomes excessively apprehensive, tense, and uneasy about the prospect of some terrible event" (Whitbourne & Halgin, 2015). In addition, anxiety has physiological aspects, such as pain, tremors, chills, numbness, among others. It is subdivided into i) adaptive anxiety, which lasts for an appropriate period, ii) temporary anxiety, induced by stressful events, and iii) anxiety disorders, in which fear and anxiety are excessive, causing behavior-related disorders and other impairments to the subjects' personal and social lives (American Psychiatric Association [APA], 2014). Although few studies concisely evidence the correlation between this comorbidity and this emotional factor, anxiety affects a significant percentage of patients diagnosed with AH (Vanhoof et al., 2014), and plays a modulating role in these relationships.

In summary, it is possible to argue that stress and anxiety are intrinsic variables to human life, however, when biological, psychological and social coping resources are overloaded, they can harm health.

Therefore, considering the importance of broadening the understanding of the psychological and emotional factors related to AH, which mainly focus on the physical and biological aspects, the aim of this study was to carry out an integrative literature review to assess the relationship between stress and anxiety in hypertensive patients.

Method

Design

This is an integrative literature review on the relationship between stress and anxiety in hypertensive patients. The integrative literature review aims to synthesize results obtained in research on a theme or topic, in a systematic, orderly and comprehensive way. It allows the integration of studies with different methods, in order to combine data from theoretical and empirical literature, enabling a more comprehensive understanding of the object of study (Ercole, Melo, & Alcoforado, 2014).

The integrative review construction process follows six distinct stages, namely: the identification of the theme and selection of the hypothesis or research question; establishment of inclusion and exclusion criteria for studies/sampling or literature search; definition of information to be extracted from selected studies/categorization of studies; evaluation of included studies; interpretation of results; and presentation of the review/ knowledge synthesis (Ercole et.al., 2014).

Procedure

An electronic search of articles indexed in the PsycINFO, Capes Portal, Scielo and Medline BVS-PSI databases was performed in June 2018. The following descriptors were used: 'hypertension' and 'stress' and 'anxiety', and their correspondents in the Portuguese language 'hipertensão arterial','estresse and 'ansiedade', and in Spanish, 'hypertensión', 'estrés' and 'ansiedad'

In order to reliably follow the proposal of this review, articles that met the following inclusion criteria were selected: a) studies available in full, in online format; b) empirical articles; c) studies that investigated the relationship between arterial hypertension and the psychological aspects of stress and anxiety; d) have been published between July 2013 and June 2018; e) be in English, Spanish or Portuguese.

In view of the established criteria, the selection of articles was performed by a reviewer, who was based on reading the titles and abstracts (resumo and *resumen*) of the studies. The research initially resulted in a total of 3,354 publications, being 3,335 in the Capes Portal, three in the PsycINFO database, three in Scielo, and 13 in LILACS. Given the saturation of articles, which were repeated and distanced themselves from the theme sought, and the impossibility of exploring the number of publications referred to in a timely manner, 1,000 articles were analyzed in the Capes Portal and 19 in the other databases.

Studies that had not specifically investigated the variables of interest (554), not published in the last six years (4), repeated (226), systematic reviews (78), in other languages (7), and those that were not scientific articles (150) were excluded. In the end, 14 studies were selected for meeting the inclusion criteria previously established.

Results

Briefly, information about the studies referring to the authors/year, the research design, the main characteristics of the sample, the instruments used and the relevant results were listed, as listed in Table 1.

Table 1 – Information about the studies included in the systematic review

Authors/Year	Design	Sample	Instruments	Main findings
Águila et al. (2013);	Quantitative	40 patients, age group 33 to 77	State -Trait Anxiety Inventory (STAI- R); Beck Depression Inventory (BDI)	There was a significant correlation between Blood Pressure, anxiety and depression in male patients.
Bacon, Campbell, Arsenault, & Lavoie (2014)	Quantitative	197 people, age group ≥18 years (*M*=58)	Self-report questionnaire; Psychiatric interview (PRIME- MD)	Patients diagnosed with Anxiety Disorder were more likely to develop Arterial Hypertension when compared to those who did not have this diagnosis.
Balint et al. (2016)	Quantitative	141 patients, unidentified age group.	German version of the Hospital Anxiety and Depression Scale (HADS-D, HADS-A); Trier Inventory for the Assessment of chronic stress (TICS-SSCS).	Patients diagnosed with Post-traumatic Stress Disorder had controlled blood pressure levels, despite high scores on the stress and anxiety scales.
Hernández Portela, Barbeito, Cabrera, & Castro (2013)	Quantitative	Study group= 19 cases. Control group = 38 cases.	Tests de vulnerabilidad al stress; Inventário de ansiedad rasgo-estado (IDARE).	The presence of psychosocial aspects stress, anxiety and depression were not considered as triggering factors for acute coronary events.
Kretchy, Owusu-Daaku, & Danquah (2014)	Quantitative	324 participants (under 18 and over 70 years)	Depression, Anxiety and Stress Scale (DASS) – 21	The chronic status of hypertensive patients manifested symptoms of anxiety, depression and stress.
László et al. (2016)	Not specified	173 patients (53 to 70 years)	Beck Depression Inventory (BDI); Hamilton Anxiety Scale (HAM- A).	Arterial Hypertension is significantly associated with anxious and depressive temperaments.
Li et al. (2016)	Quantitative	1354 workers, 715 males (52.8%); 639 females	Occupational Stress Inventory (OSI-R)	Increased occupational stress was associated with an increased risk of Hypertension.

		(47.2%)		
Mushtaq & Najam (2014)	Quantitative	237 (30 to 65 years) Hypertensive group: 77 men and 60 women; Non-hypertensive group: 50 normotensive men and 50 women	Demographic information questionnaire; Depression, Anxiety and Stress Scale (DASS)	Depression, Anxiety and Stress were indicated as predictors for Arterial Hypertension, especially in the “high” level category.
Palagini et al. (2015)	Quantitative	330 female and male patients (Age group *M*= 56.6)	Beck Depression Inventory (BDI); Self-rating Anxiety Scale (SAS); State-Trait Anxiety Inventory (STAI)	Hypertensive patients with symptoms of insomnia were more stressed and with fewer coping strategies; anxiety and depression play a modulating role in these relationships (insomnia, hypertension and stress).
Schmieder, Grassi, & Kjeldsen (2014)	Qualitative	4574 participants: treatment resistant group (2,649) and uncontrolled hypertension group (1,925)	Survey methodology: online survey	The diagnosis of Arterial Hypertension and the lack of blood pressure control lead to a high emotional burden for patients, who were more anxious and stressed.
Stein et al. (2014)	Not specified	52,095 people, age group ≥18 years	WHO Composite International Diagnostic Interview (now CIDI 3.0)	The psychopathological and psychiatric diagnosis of the population analyzed is associated with the subsequent diagnosis of Arterial Hypertension in a large part of the sample.
Tominaga et al. (2015)	Multimethod	503 patients, female (321) and male (182), aged between 40 and 75 years (*M*=62)	Self-administered questionnaire; State–Trait Anxiety Inventory (STAI)	Patients with abnormal levels in lifestyle-related disease markers (including Hypertension) scored significantly on the anxiety scale, which implies that there was a significant psychological impact, albeit in the short term.
Uceda, Fernández,	Multimethod	94 participants,	Structured interview; Beck	Hypertensive people had higher scores in the anxiety

Lópeza, & García-Vera (2013)		aged from 38 to 77 years. Normotensive group *n*=37; HTA-E group: *n*=57	Anxiety Inventory (BAI); Beck Depression Inventory (BDI-II); Survey of Recent Life Experiences (SRLE).	scales, as well as in the depression and stress inventories (despite not presenting significant statistics), when compared to the group of normotensive people.
Vanhoof et al. (2014)	Quantitative	101 patients (73% women)	Health Survey (SF-36); Depression, Anxiety and Stress Scale (DASS)	Symptoms of stress, depression and anxiety affect about 50% patients diagnosed with Pulmonary Arterial Hypertension.

The works included (14) are from different Asian, American and European countries such as China, Pakistan, United States, Cuba, Germany, Italy, Hungary and Spain, developed mainly in the area of medicine. Of these, three articles were published in 2013, six in 2014, two in 2015, and three in 2016.

Regarding the design used, nine were quantitative, two qualitative type, two qualitative-quantitative and only one did not clearly specify the type of study. The data collection techniques used in qualitative studies consisted of a questionnaire (mostly online) and a structured interview, while in the quantitative studies, existing and validated inventories were used, especially those assessing two or more variables concurrently, they are: State-Trait Anxiety Inventory (STAI-R), Beck Depression Inventory (BDI), Self-report questionnaire Psychiatric interview (PRIME-MD), German version of the Hospital Anxiety and Depression Scale (HADS-D, HADS-A); Trier Inventory for the Assessment of chronic stress (TICS-SSCS), Tests de vulnerabilidad al stress; Inventário de ansiedad rasgo-estado (IDARE), Depression, Anxiety and Stress Scale (DASS-21), Occupational Stress Inventory (OSI-R), Self-rating Anxiety Scale (SAS), Survey of Recent Life Experiences (SRLE) and Health Survey (SF-36).

Regarding the sample, men and women participated, with and without a previous diagnosis of AH, aged between 16 and 75 years. The diversity of environments and contexts in which the studies were developed is also notorious, among them, university and general hospitals, clinics, and work environments of the participants, such as oil industries.

Discussion

The aim of this study was to conduct an integrative literature review to assess how psychological constructs, such as anxiety and stress may be associated with arterial hypertension. From the results found, it was identified that studies on this topic can be grouped into three interrelated categories: a) the impact caused by the diagnosis of non-communicable chronic diseases (Kretchy et al., 2014; Schmieder et al., 2014; Tominaga et al., 2015); b) psychological factors associated with AH (Águila et al., 2013; Uceda et al., 2013; Bacon et al., 2014; Mushtaq & Najam, 2014; Stein et al., 2014; Vanhoof et al., 2014; Palagini et al., 2015; László et al., 2016; Li et al., 2016); c) dissociation between psychological and physical variables (Hernández et al., 2013; Balint et al., 2016).

a) The impact caused by the diagnosis of non-communicable chronic diseases

Chronic pain diagnoses often raise the existence of anxiogenic fantasies, in addition to difficulty in understanding and accepting (Kitayama, 2010). Thus, the idea of dealing with the chronic condition until the end of life can lead to psychological dysfunctions, as discussed by the authors of the selected studies below.

Kretchy et al. (2014) discuss that living with the hypertensive condition and the demands attributed to it, such as improvements in food and physical exercise, lead patients to a situation of stress and anxiety, and, in the long term, to depressive conditions. In their study, consisting of 400 participants, it was observed from the *Depression anxiety stress scale instrument* that anxiety was reported by 225 hypertensive patients (57%), while stress was reported by 82 people (20%) and depression (from moderate to severe) in 17 (4%). Despite considering medication adherence as one of the requirements that patients must follow, the association with drug non-adherence and psychological aspects were not significant in this study, which is justified by the disproportionate distribution of the sample, which the authors point out as a limitation.

In this context, Tominaga et al. (2015) point out that of the 503 participants in their study, 60% presented, after the check-up, values considered abnormal in the markers of lifestyle-related diseases, such as diabetes and dyslipidemia and, consequently, arterial hypertension. After disclosing the diagnosis, the prevalence of higher levels of anxiety was observed, which contrasted with the scores in the 'unreported diseases' group. The observation that the authors make, however, is that the increase in scores on the state-trait anxiety scale refers to the 'labelling' of certain diseases, that is, the stigmatization of living with a chronic disease.

Although the aforementioned study did not explain a discussion about the brevity of communication between physician-user, the method used to disclose the diagnosis, and the content of the recommendations, it is believed that these are variables that can negatively influence beliefs and behaviors of patients, when they are done vertically. Study participants answered, after a month of medical evaluation, a questionnaire to identify improvements in daily behavior. Regardless of the results, the analysis of the participants' statements reported that there were no significant behavioral changes, which can be explained by the lack of clinical management and favorable conditions for maintaining the treatment. At the primary care level, since health services aim to ensure access and quality to their users, chronic diseases are still a major challenge for teams (Brasil, 2014a).

Given this, it is clear that in addition to the pathophysiological changes caused by the diagnosis of AH, there is a great emotional burden for patients to the point of affecting daily life, especially interpersonal relationships, the development of work activities, and mood (Schmieder et al., 2014).

Another factor to be considered as a trigger for psychological conflicts in these cases is the minimization of patient suffering by family members or health professionals (Kitayama, 2010). It is essential for the treatment of chronic diseases, and on the other hand, a participative posture of users that contributes to the improvement of their clinical condition, however, given the fragility of the support network and the feelings of hopelessness and impotence (Kitayama, 2010), this posture breaks down and can cause great emotional distress. For this reason, interdisciplinary and interconnected action is necessary, in order to encourage "[…] the development of personal resources in order to achieve a better quality of life and autonomy" (Kitayama, 2010, p.131).

b) Ppsychological factors associated with arterial hypertension

Health problems can be triggered by a varied system of contexts, such as biological, psychological and social, which include, among other aspects, behaviors, beliefs, culture and the environment. With regard to psychosocial factors, the influence on health or illness can occur through direct biological changes, which manifest themselves as part of an emotional reaction or behavior patterns. For this reason, moving away from the Cartesian mind-body logic, it is possible to reflect on the correlation between psychological aspects and AH (Straub, 2014).

To assess the implications caused by anxiety and depression in people with resistant hypertension, Águila et al. (2013) note that these measures were reported in the male population of the sample, due to the manifestation of chronic stress, considered an adaptive mechanism of the body that responds in different ways to situations. When this process is interrupted, stress ends up advancing the most serious phases, bringing harm to health.

In their study of oil workers, Li et al. (2016) found that occupational stress, caused by work demands, favored the emergence of 231 cases of hypertension, since most professionals felt psychologically pressured and, as a way to minimize suffering, adopted unhealthy behaviors, such as alcohol intake, high-fat diets, cigarette use, and sedentary lifestyle.

Furthermore, stress can lead to less effective coping responses, as shown by Palagini et al. (2015) in hypertensive patients, which is strongly associated with depression and anxiety, considered predictors and modulators of AH, which has grown significantly in recent years.

According to Bacon et al. (2014) and Stein et al. (2014), parallel to hypertension, psychiatric disorders, especially those related to depressive mood and anxiety, are constantly diagnosed in adults, which draws attention to the need for more effective prevention and treatment approaches.

Mushtaq and Najam (2014) note that people who report higher levels of hopelessness are more likely to become hypertensive in the future. In this research, the depression, anxiety and stress dimensions were categorized into three levels (low, medium and high), in which the high category stood out compared to the others, indicating a significant relationship with hypertension. Demographic variables such as income, type of work and workload were also indicated as predictors for AH.

About the emotional and cognitive profile of hypertensive people, Uceda et al. (2013) suggest that people with hypertension, when compared to normotensive individuals, statistically demonstrate higher levels of anxiety and depression, in addition to hostile thoughts and aggressive behavior. Accordingly, Lázló et al. (2016) report that anxious and depressive temperaments act as risk markers for the development of hypertension and other cardiovascular complications, as well as anger and hostility.

Finally, although the study by Vanhoof et al. (2014) refer to Pulmonary Arterial Hypertension (PAH), considered an abnormally high condition of pulmonary artery pressure, stress, anxiety and depression affect these people even more, as it is a difficult diagnosis and prognosis, in addition to causing functional limitations. Thus, it was noted that 50% patients diagnosed with PAH are affected by symptoms of stress, anxiety and depression. Despite the prevalence, few studies focus on this theme, making more consistent data unfeasible.

c) Physical health versus mental health relationship: also a matter of method

In order to assess the main risk factors that can lead patients to develop coronary

events, Hernández et al. (2013) argue that the psychosocial aspects of cardiovascular diseases are given by the individual's personality traits, as well as by their life experiences. Thus, traumatic stress conditions, together with situations of social isolation, lack of affective support, and anxiety traits favor physiological changes – such as increased blood pressure – that trigger cardiac complications.

Despite these considerations, and the study sample composed of 100% hypertensive patients, the variables state-trait anxiety, stress and depression did not indicate statistically significant data that prove a correlation between these measures. However, these data are not conclusive, since the study sample is limited (38 participants, sometimes disproportionately distributed in subgroups), and the statistical analysis applied in each association is not clear. In addition, elements that could help in understanding the results, such as means and standard deviations, were not provided, which makes understanding impossible for readers.

The study by Balint et al. (2015) started from the premise that hypertensive patients have a higher burden of Post Traumatic Stress disorder (PTSD), since this syndrome is characterized by high cardiovascular reactivity to traumatic triggers. This hypothesis is confirmed when the group of people with controlled blood pressure under medication show more symptoms of stress and, therefore, anxiety and depression.

Nevertheless, it is considered that this study exposes contradictory data that give rise to questioning, because it is two groups of hypertensive people (one with controlled pressure and the other with uncontrolled pressure), in which the first, despite maintaining the pressure levels stable due to medication, are sensitive to psychosocial variables, while the second did not score significantly on the scales applied. Therefore, it is necessary to assess whether antihypertensive medication would be causing direct implications on anxiety, stress and depression indicators.

In general terms, it is important to point out that most studies verified, in addition to the emotional aspects defined in this review (stress and anxiety), significant levels of depression, such as Águila et al. (2013), Hernández et al. (2013), Uceda et al. (2013), Kretchy et al. (2014), Mushtaq e Najam (2014), Stein et al. (2014), Vanhoof et al. (2014), Palagini et al. (2015), e László et al. (2016), which highlights the disturbance of body homeostasis, which triggers the adaptation process characterized, among other changes, by the increase in adrenaline secretion, producing several systemic manifestations

Final Considerations

The results discussed in this review show that there is a relationship between AH and stress and anxiety, but in some studies, it was difficult to clearly establish this. In general, most results show a relationship between psychological, emotional, and behavioral factors (aspects related to daily life, working life, personality and emotional burden) and the modulation of the biological response, favoring the development or maintenance of arterial hypertension. On the other hand, there are studies that show that being affected by the disease can make the subject vulnerable to psychological, emotional and behavioral changes.

It is noteworthy that although the researches expand the discussions and propose to discuss the biological and psychological aspects at the same time, the look at the subject, in its uniqueness, is still limited, an issue observed by the superficiality of the arguments about the psychological factors of the analyzed studies that, for the most part, are based on statistical analyses, giving the idea of reductionism to the psychic dimension. Therefore, the

need for a biopsychosocial vision is advocated, capable of considering the way of life, the forms of communication, the political organization, and the complexity of feeling, reflected in the mind and body of each person, in different ways.

These ideas are in line with the expansion of the concept of health, not as the absence of disease, widely used in the field of health psychology, which substantially contributes to changes and constructions of the public health system, by breaking the one-sidedness of care, and focusing to primary interventions (Sobrosa, Zappe, Patias, Fiorin, & Dias, 2014). In the case of arterial hypertension and psychological constructs, this study contributes to the formulation of health promotion practices and the management of psychology professionals focused on the influence of biological, social and behavioral factors in the health and disease processes of users, the example of the Hiper-Dia groups.

In this sense, there is a need to promote a reflection on the importance of managing the comprehensive care of users, focusing on health promotion and disease prevention, capable of reducing the risks of illness, and the development of interdisciplinary and psychosocial factors that contribute to the insertion of the psychology professional in health services, helping to improve the subjects' well-being and the humanization of services.

Thus, future studies could use a multimethod design or an animal model, which would contribute to investigate the function of this relationship and thus enable the development of more effective measures - in the context of primary and secondary and/or even clinical prevention.

Therefore, it is expected that this study can reaffirm the relevance of health care, in an integral way, so that the risks of illness are reduced; and encourage the development of research in the field of psychology, about the influence of emotional aspects on arterial hypertension.

References

American Psychiatric Association [APA]. (2014). *Manual diagnóstico e estatístico de transtornos mentais [recurso eletrônico]: DSM-5*. Porto Alegre, RS: Artmed.

Águila, F. J., García, J. D. M., Navarrete N. N., Cortés, J. L. R., Torres, C. F., & Alonso, J. J. (2014). Ansiedad, depresión y su implicación en la hipertensión arterial resistente. *Hipertensión y Riesgo Vascular*, *31*(1), 7-13. doi: 10.1016/j.hipert.2013.08.001

Andrade, S. S. de A., Stopa, S. R., Brito, A. S., Chueri, P. S., Szwarcwald, C. L., & Malta, D. C. (2015). Prevalência de hipertensão arterial autorreferida na população brasileira: análise da Pesquisa Nacional de Saúde, 2013. *Epidemiologia e Serviços de Saúde*, *24*(2), 297-304.

Bacon, S. L., Campbell, T. S., Arsenault, A., & Lavoie, K. L. (2014). The impact of mood and anxiety disorders on incident hypertension at one year. *International Journal of Hypertension*, *2014*, 1-7. doi: 10.1155/2014/953094

Balint, E. M., Boseva, P., Schury, K., Guendel, H., Rottbauer, W., & Waller, C. (2016). High prevalence of post-traumatic stress in patients with primary hypertension. *General Hospital Psychiatry, 38*(1), 53-58. doi: 10.1016/j.genhosppsych.2015.10.002

Brasil. (2011). Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Análise de Situação de Saúde. *Plano de ações estratégicas para o enfrentamento das*

doenças crônicas não transmissíveis (DCNT) no Brasil 2011-2022. Brasília, DF: Ministério da Saúde. Recuperado de http://bvsms.saude.gov.br/bvs/publicacoes/plano_acoes_enfrent_dcnt_2011.pdf

Brasil (2014). Ministério da Saúde. Secretária de Ciência, Tecnologia e Insumos Estratégicos. Departamento de Ciência e Tecnologia. *Diretrizes metodológicas: elaboração de revisão sistemática e metanálise de estudos observacionais comparativos sobre fatores de risco e prognóstico*. Brasília, DF: Ministério da Saúde.

Brasil. (2014a). Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Atenção Básica. *Estratégias para o cuidado da pessoa com doença crônica*. Brasília, DF: Ministério da Saúde. Recuperado em 7 de outubro de 2017, de http://bvsms.saude.gov.br/bvs/publicacoes/estrategias_cuidado_pessoa_doenca_cronica_cab35.pdf

Campos Júnior, R., Colombari, E., Cravo, S.,& Lopes, O. U. (2001). Hipertensão arterial: o que tem a dizer o sistema nervoso. *Revista Brasileira de Hipertensão, 8*(1), 41-54

Cohen, B. E., Edmondson, D., & Kronish, I. M. (2015). State of the art review: depression, stress, anxiety, and cardiovascular disease. *American Journal of Hypertension, 28*(11), 1295-302. doi: 10.1093/ajh/hpv047

Colombo, F., & Plavnik, F. L. (2009). Avaliação do paciente hipertenso. In C. V. Júnior, A. Timerman, & E. Stefanini (Orgs.), *Tratado de Cardiologia SOCESP* (p. 250-375). Barueri, SP: Manole.

Ercole, F. F., Melo, L. S., & Alcoforado, C. L. G. C. (2014). Revisão integrativa *versus* revisão sistemática. *Editorial. Revista Mineira de Enfermagem, 18*(1), 9-12.

Fonseca, F. de C. A., Coelho, R. Z., Nicolato, R., Malloy-Diniz, L. F.,& da Silva Filho, H. C. (2009). A influência de fatores emocionais sobre a hipertensão arterial. *Jornal Brasileiro de Psiquiatria, 58*(2), 128-134.

Henn, R. C., & Machado, F. V. (2016). O corpo como acontecimento semiótico: construções do self, perfomances e outras semiosis. *Intexto, 1*(37), 215-226. Recuperado de https://seer.ufrgs.br/intexto/article/view/67397/39616

Hernández, M. G., Portela, R. G., Barbeito, T. O. T., Cabrera, J. R. C., & Castro, Y. D. (2013). Factores de riesgo de eventos coronarios agudos: importancia del factor psicosocial. *Revista Ciencias Médicas, 17*(3), 3-15. Recuperado de http://scielo.sld.cu/pdf/rpr/v17n3/rpr02313.pdf

Kitayama, M. M. G. (2010). O desafio da dor sem fim: reflexões sobre a intervenção psicológica junto a pessoas portadoras de dor crônica. InW. L. Bruscato, C. Benedetti,&S. R. de A. Lopes(Orgs.), *A Prática da psicologia hospitalar na Santa Casa de São Paulo: novas páginas em uma antiga história* (p. 127-134). São Paulo, SP: Casa do Psicólogo.

Kretchy, I. A., Owusu-Daaku, F.T., & Danquah, S. A. (2014). Mental health in hypertension: assessing symptoms of anxiety, depression and stress on anti-hypertensive medication

adherence. *International Journal of Mental Health Systems, 8*(25), 1-10. doi: 10.1186/1752-4458-8-25

László, A., Tabák, Á., Kőrösi, B., Eörsi, D., Torzsa, P., Cseprekál, O., … Nemcsik, J. (2016). Association of affective temperaments with blood pressure and arterial stiffness in hypertensive patients: a cross-sectional study. *BMC cardiovascular disorders*, *16*(1), 158. doi:10.1186/s12872-016-0337-9

Li, R., Gao, X., Liu, B., Ge, H., Ning, L., Zhao, J., & Liu, J. (2016). Prospective cohort study to elucidate the correlation between occupational stress and hypertension risk in oil workers from Kelamayi City in the Xinjiang Uygur autonomous region of China. *International journal of environmental research and public health*, *14*(1), 1-12. doi:10.3390/ijerph14010001

Malachias, M. V. B., Póvoa, R. M. S., Nogueira, A. R., Souza, D., Costa, L. S., & Magalhães, M. E. (2016). 7ª Diretriz brasileira de hipertensão arterial: capítulo 3 - avaliação clínica e complementar. *Arquivos Brasileiros de Cardiologia*, *107*(3, Supl. 3), 14-17. doi: 10.5935/abc.20160153

Malta, D. C., Stopa, S. R., Szwarcwald, C. L., Gomes, N. L., Silva Júnior, J. B., & Reis, A. A. C. dos. (2015). A vigilância e o monitoramento das principais doenças crônicas não transmissíveis no Brasil - Pesquisa Nacional de Saúde, 2013. *Revista Brasileira de Epidemiologia*, *18*(Suppl. 2), 3-16. doi: 10.1590/1980-5497201500060002

Moxotó, G. de F. A., & Malagris, L. E. N.. (2015). Raiva, stress emocional e hipertensão: um estudo comparativo. *Psicologia: Teoria e Pesquisa*, *31*(2), 221-227. doi: 10.1590/0102-37722015021189221227

Mushtaq, M., & Najam, N. (2014). Depression, anxiety, stress and demographic determinants of hypertension disease. *Pakistan journal of medical sciences, 30*(6), 1293-8. doi: 10.12669/pjms.306.5433

Organização Mundial da Saúde [OMS]. (2018). *Novas estatísticas mundiais de saúde*. Recuperado de https://www.paho.org/bra/index.php?option=com_content&view=article&id=5676:organizacao-mundial-da-saude-divulga-novas-estatisticas-mundiais-de-saude&Itemid=843

Organização Mundial da Saúde [OMS]. (1995). *Classificação estatística internacional de doenças e problemas relacionados à saúde; 10ª revisão*. São Paulo, SP: EDUSP.

Palagini, L., Bruno, R. M., Cheng, P., Mauri, M., Taddei, S., Ghiadoni, L, ... , Morin, C. M. (2015). Relationship between insomnia symptoms, perceived stress and coping strategies in subjects with arterial hypertension: psychological factors may play a modulating role. *Sleep Medicine*, *19*(1), 108-115. doi: 10.1016/j.sleep.2015.09.026

Passos, V. M. de A., Assis, T. D., & Barreto, S. M. (2006). Hipertensão arterial no Brasil: estimativa de prevalência a partir de estudos de base populacionalHypertension in Brazil: estimates from population-based prevalence studies. *Epidemiologia e Serviços de Saúde*, *15*(1), 35-45. doi: 10.5123/S1679-49742006000100003

Sobrosa, G.M.R., Zappe, J.G., Patias, N.D., Fiorin, P.C., &Dias, A.C.G. (2014). O desenvolvimento da Psicologia da saúde a partir da construção da saúde pública no Brasil. *Revista de Psicologia da IMED,* 6(1), 4-9.

Schmieder, R. E., Grassi, G., & Kjeldsen, S. E. (2013). Patients with treatment-resistant hypertension report increased stress and anxiety: a worldwide study. *Journal of Hypertension, 31*(3), 610-615. doi: 0.1097/HJH.0b013e32835d6e53

Stein, D. J., Aguilar-Gaxiola, S., Alonso, J., Bruffaerts, R., de Jonge, P., Liu, Z., … Scott, K. M. (2014). Associations between mental disorders and subsequent onset of hypertension. *General Hospital Psychiatry, 36*(2), 142-149.

Straub, R.O. (2014). *Psicologia da saúde: uma abordagem biopsicossocial*. São Paulo, SP: Editora ArtMed.

Tominaga, T. Matsushima, M., Nagata, T., Moriya, A., Watanabe, T., Nakano, Y., ..., Fujinuma, Y. (2015). Psychological impact of lifestyle-related disease disclosure at general checkup: a prospective cohort study. *BMC Family Practice*, *16*(60), 1-10. doi: 10.1186/s12875-015-0272-3.

Uceda, I. M., Fernández, J. S., Lópeza, R. E., & García-Vera, M. P. (2013). Perfil emocional y cognitivo de la hipertensión arterial esencial mantenida contra Normotensão. *Clínica e Saúde, 24*(2), 1-15.

Vanhoof, J. M. M., Delcroix, M., Vandevelde, E., Denhaerynck, K., Wuyts, W., Belge, C., & Dobbels, F. (2014). Emotional symptoms and quality of life in patients with pulmonary arterial hypertension. *The Journal of Heart and Lung Transplantation, 33*(8), 800-808. doi: 10.1016/j.healun.2014.04.003

Whitbourne, S. K., & Halgin, R. P. (2015). *Psicopatologia: perspectivas clínicas dos transtornos psicológicos*. Porto Alegre, RS: AMGH.

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