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## Research Article

# Anxiety and Depression in Hypertensive Women: Influence on Symptoms and Alexithymia

### Abstract

**Objectives:** Depression and anxiety are common mental disorders in women with cardiovascular disease. However, little research has examined the role of these disorders among women suffering from essential hypertension (EH). The present study explored the prevalence of both depression and anxiety in women with hypertension. It also examined the relationships of depression and anxiety with the frequency and severity of physical symptoms, alexithymia and the dimensions of difficulty in identifying and describing feelings (DIF and DDF).

**Method:** The sample consisted of 111 women (mean age= 58 years) who attended a health care center to control their hypertension. Participants completed the Hospital Anxiety and Depression Scale (HADS), a checklist of physical symptoms and the Twenty-Item Toronto Alexithymia Scale (TAS-20).

**Results:** The prevalence of anxiety was higher (65%) than the prevalence of depression (30%). Bivariate correlations showed that depression and anxiety were associated with more frequent and greater levels of physical symptoms, and more alexithymia. In multiple regression analyses, only anxiety positively predicted the frequency and severity of the symptoms, and the dimensions of DIF and DDF. However, with respect to total alexithymia, both depression and anxiety emerged as positive and independent predictors.

**Conclusions:** The results highlight the importance of detecting anxiety disorders in women with EH due to their high prevalence. They also provide evidence of the independent role that both depressive and anxiety disorders can play when predicting alexithymia in these patients.

## Introduction

Cardiovascular disease (CVD) is one of the leading causes of mortality and morbidity worldwide. One of the main risk factors that can accelerate the onset and development of CVD is essential hypertension [1]. Essential hypertension also constitutes a chronic health problem whose management entails adherence to pharmacological treatment and a change of the patient's unhealthy habits, which can worsen his or her physical and emotional well-being [2].

Regarding the etiology, prognosis and clinical manifestations of both CVD and essential hypertension, there is an increasing recognition of the remarkable influence that gender differences have on these diseases [3]. Up to 55 years of age CVD usually appears in men before it appears in women. However, the prevalence of both CVD and hypertension increases abruptly in women after menopause. Women with CVD present worse diagnoses and are less likely to be referred to therapeutic procedures and cardiac rehabilitation [4]. Moreover, women with CVD rapidly resume the tasks associated with their social and family roles because of their sense of responsibility, tend to have lower self-esteem and often exhibit an amplified perception of physical symptoms [4,5].

Despite the relevance of these findings, it should be noted that substantially less research has focused on gender differences and psychosocial aspects concerning hypertension. Some studies have

shown that hypertensive women perceive less control over their health and report greater physical symptoms and sleeping difficulties than men [6,7].

Furthermore a great number of studies have suggested that depression and anxiety can contribute to CVD risk, either increasing the incidence of this pathology in healthy people [8], or worsening the prognosis in individuals with established CVD [9].

Depression has been found to be a strong predictor of recurrent CVD events and a worse adjustment to this illness [4,5]. Moreover, it has been estimated that the prevalence of depression in the population of patients with CVD varies between 20 and 35% [10]. In hypertensive patients, depression has also been linked to a lower quality of life and well-being and worse adherence to pharmacological treatment [11-13].

In the case of women who have either CVD or hypertension, these negative consequences are also evident. For example, it has been observed that depression in women who suffered from CVD is related to a worse physical and mental quality of life, a higher number of symptoms and more difficulties when performing everyday activities [14,15]. Hypertensive women also tend to report more emotional distress compared to hypertensive male patients [7,16].

Regarding anxiety there is evidence supporting that between 15 and 20% of patients with CVD exhibit anxious symptoms and some type of anxiety disorder [17]. This percentage seems to increase in

the case of essential hypertension. In this line, some investigations have revealed that anxiety could affect 57% of people who suffer from hypertension [18].

Anxiety has also been linked to a greater probability of death due to coronary disease [19], and is likely to increase the risk that healthy women will suffer from hypertension [20]. Some results have also shown that anxiety predicts, to a greater extent than depression, the occurrence of more coronary events [21], hospitalizations and doctor visits [22].

Despite this empirical support, until now, the role that anxiety can play in the population of women who suffer from hypertension has not been thoroughly examined. Equally, the understanding of the relative and negative impact that both depression and anxiety could have on hypertensive women's health has been rarely addressed.

The study by Hildingsh & Baigi [23], which was conducted with a sample of hypertensive patients which were not differentiated by gender, highlighted that anxiety symptoms were related to lower psychological well-being and more sleep problems. Similar results were shown in the study by Rueda & Pérez-García [24], in which the emotional distress reported by hypertensive patients predicted worse physical and psychological well-being. In this study the variable of emotional distress was calculated by adding the scores of anxiety and depression, thus, it was not possible to compare the contribution of both disorders to the degree of well-being experienced by the patients.

Taking these results into account, it could be important for clinical and also psychotherapeutic purposes, first, to clearly identify and assess the prevalence of depressive and anxiety disorders in hypertensive women. And second, to determine the specific contribution that each of these two emotional disorders can make in the prediction of the perceived symptoms, which can be regarded as an indicator of poor physical and psychological health in these women.

On the other hand there is evidence showing that some patients with CVD could have alexithymia and, as a result, suffer from a deficit in their emotional processing [25,26].

Alexithymia can be defined as a cognitive-affective characteristic that reflects a lack of ability to understand and describe emotions, a deteriorated ability to imagine and generate fantasies, and an externally oriented thinking [27,28]. Alexithymia has been widely measured by the Twenty-Item Toronto Alexithymia Scale (TAS-20) [29]. This scale consists of three subscales, difficulty in identifying feelings (DIF), difficulty in describe feelings (DDF) and an externally oriented thinking (EOT), which are theoretically consistent with the construct of alexithymia.

In a healthy population it has been found that when there is a moderate level of alexithymia (TAS-20>49), the risk of suffering from both hypertension and arteriosclerosis increases [30]. In hypertensive people, alexithymia has also been linked to increased severity of hypertension [31]. Equally, the research conducted by Alemán & Rueda [16], highlighted that the patients who had hypertension for a long duration (> 5 years) presented a higher level of alexithymia compared to patients who suffered from hypertension for a shorter time (< 1 year).

Depression and anxiety have been demonstrated to be positively associated with global alexithymia and specially with the dimensions of DIF and DDF [32,33]. In contrast, the dimension of EOT seems to be much less relevant when considering its contribution to the presence of both depression and anxiety.

Some investigations have demonstrated that alexithymic patients who suffered from CVD [26], or another type of chronic pathology, such as asthma or psoriasis [34,35], scored significantly higher on both anxiety and depression. However, there is also evidence supporting the lack of association between alexithymia, depression and anxiety [30].

Overall, the investigation of the relationship between depression and anxiety with alexithymia and the facets of DIF and DDF in hypertensive women has received little attention. Recent research [16], has evidenced that emotional distress was positively correlated with alexithymia in hypertensive patients. Nonetheless, neither the specific predictive utility of both depression and anxiety with respect to alexithymia, nor the inclusion of the dimensions of DIF and DDF, were taken into account in this study when examining the female subgroup of the sample. Addressing this issue could be relevant from an empirical and clinical point of view, since it could provide more useful information about the manner and the extent to which depressive and anxiety disorders may be specifically and differentially related to alexithymia in women with essential hypertension.

In the present research, we first aimed to explore the prevalence of anxiety and depression in a sample of hypertensive women. Second, we tested how these two emotional disorders were related to physical symptoms, alexithymia and the dimensions of DIF and DDF. And third, we compared the independent contribution of both depression and anxiety in the prediction of physical symptoms, alexithymia and the dimensions of DIF and DDF.

We expected that both anxiety and depression would be significantly associated with physical symptoms, alexithymia and the dimensions of DIF and DDF. We also hypothesized that both disorders would positively predict the above-mentioned outcome variables.

## Methods

### Participants and procedure

To conduct this research, we used a target population of 463 women with a diagnosis of either moderate or chronic essential hypertension. These women were included in a program of periodic visits for the control of their hypertension. These visits occurred at a primary health care center of Gran Canaria, Spain. The study was approved by the health center's ethics committee.

The sample was selected through systematic random sampling. The inclusion criteria were as follows: aged between 18 and 70 years and having a diagnosis of essential hypertension. Exclusion criteria included the follow: having a diagnosis of established cardiovascular or cerebrovascular disease, suffering from another type of chronic illness, such as renal insufficiency, cancer, diabetes, asthma, or psychiatric illness, and/or having been in psychological treatment during the last year.

Of the 463 hypertensive women who were potential participants, 170 were recruited to participate. Of these, thirty-five were eliminated for several reasons: twenty-one patients were not contacted, 14 did not fulfill the inclusion criteria and 17 did not provide the informed consent. Hence, 118 women agreed to participate in the investigation and were informed about the purpose of the study. Once they signed the informed consent, they were provided with the booklet with different scales to take home and to return completed to the primary health center.

Seven participants were dismissed from the study: four of them because they had not adequately completed the booklet and three because they were considered as outliers after an initial review of the collected data. Therefore, the final study sample was composed of 111 women with a mean age of 58 years ( $SD=9.66$ ).

## Measures

The booklet included a series of questions regarding socio-demographic aspects and questions referring to hypertension. It also included the following scales:

**The Hospital Anxiety and Depression Scale (HADS) [36]:** This scale assesses the level of anxiety and depression resulting from having a health problem. The scale used in this investigation was based on the original version [36], and on previous studies [37,38]. The instrument contains 14 items divided into the subscales of anxiety (7 items) and depression (7 items). Each item is rated on a four-point scale ranging from 0 to 3. Based on previous studies [39], a score  $\geq 8$  on each subscale was considered as an indicator of the presence of either depression or anxiety. The Cronbach's alpha reliability coefficients of both subscales were 0.69 in the present study.

**A Checklist of Physical Symptoms:** This self-report questionnaire was designed to assess the number and severity of a list of physical symptoms (i.e., headache, dizziness, nervousness, palpitations and respiratory difficulty). The patients had to select the number of symptoms they experienced in that moment and also indicate their severity on a five-point scale (from 1="Nothing or almost nothing" to 5="Very much"). Cronbach's alpha reliability coefficients were .61 for the frequency subscale and .73 for the severity subscale.

**The Toronto Alexithymia Scale 20 (TAS-20) [29]:** This questionnaire measures the level of alexithymia. The items used in this questionnaire were derived from previous studies [40], and a pilot study [38]. The instrument is composed of 20 items rated on a five-point scale (from 1="Nothing" to 5="A lot"). The scale consists of three subscales: the TAS 1, which measures the difficulty in identifying feelings (DIF); the TAS 2, which evaluates the difficulty in describing feelings (DDF); and the TAS 3, which measures utilitarian and externally oriented thought (EOT). In this study, we used the scores yielded on the total scale and on the TAS 1 and TAS 2 subscales respectively. The EOT subscale was not utilized since this dimension does not seem particularly relevant in patients with either CVD or hypertension.

The Cronbach's alpha reliability coefficients were appropriate (0.82 for the total TAS-20, 0.85 for the TAS-1 and 0.78 for the TAS-2).

## Statistical analysis

First, three multivariate outliers with extreme scores on two variables of the study were found and subsequently eliminated. Assumptions of normality, linearity and homoscedasticity were also checked and met for the aforementioned variables. Second, to calculate the prevalence of anxiety and depression in the sample, two groups were formed using a score of  $\geq 8$  as the cut-off point on the subscales of depression and anxiety. Then, the frequency and percentage of women belonging to each of these groups were obtained.

To examine the relationship of depression and anxiety with the frequency and severity of the physical symptoms, alexithymia and the dimensions of DIF and DDF, Pearson correlation coefficients were calculated. Finally, after checking that there were no effects of multicollinearity between anxiety and depression, several multivariate regression analyses were conducted. Anxiety and depression were introduced as the predictor variables, and frequency and severity of the physical symptoms, alexithymia and the facets of DIF and DDF entered as the outcome variables respectively. Statistical analyses were performed with SPSS version 20.0. In all of the analyses, the level of significance used was  $<0.05$ .

## Results

### Descriptive and correlational analyses

A summary of the socio-demographic and clinical characteristics of the sample is presented in Table 1. Of the 111 women who composed the sample, 69% were married, and the rest (31%) were single, divorced, or widowed. With respect to the duration of hypertension, 12% suffered from hypertension for less than one year, 40% had hypertension for a period of 1-5 years, and the remaining 48% had hypertension for more than five years. Furthermore, the majority of the sample (96%) reported adequately complying with the prescribed treatment. Seventy percent of the women indicated properly complying with the diet, whereas 30% did not. Regarding exercise, 89% of the women reported that they exercised regularly, whereas 11% revealed not exercising regularly.

**Table 1:** Demographic and clinical characteristics of the sample.

	N	%
Marital Status		
Married	77	69
Single, divorced or widowed	34	31
Hypertension duration		
< 1year	13	12
1 to 5 years	45	40
> 5 years	53	48
Adherence to antihypertensive medication regimen		
Yes		
No	107	96
Diet compliance		
Yes	4	4
No	78	70
Regular exercise		
Yes	33	30
No	99	89
	12	11
Age	Mean	DT
	58	9.66

Means values, standard deviations and the ranges of the scores yielded on the psychosocial variables included in the study are shown in **Table 2**.

As can be observed in **Table 3**, correlational analyses showed that anxiety and depression were positively associated with the frequency and severity of physical symptoms, and with alexithymia and the dimensions of DIF and DDF. All the correlations with anxiety were higher than those observed in relation to depression.

### Prevalence of depression and anxiety

The prevalence of depression and anxiety is shown in **Table 4**. Following the specified cut-off points for the depression subscale, depression was observed in 30% of the sample (score of  $\geq 8$ ), whereas this disorder was not confirmed to be present in the remaining 70% of the sample (score of  $\leq 8$ ). These data significantly varied concerning the prevalence of anxiety. Sixty-five percent of the women showed having an anxiety disorder (score of  $\geq 8$ ), whereas there was not any evidence of this type of disorder in the remaining 35% (score of  $\leq 8$ ).

### Prediction of symptoms, alexithymia and DIF and DDF

Finally, different regression analyses were performed to determine the predictive and independent capacity of anxiety and depression with respect to the frequency and severity of the physical symptoms, alexithymia and the facets of DIF and DDF. **Table 5** shows the results of these analyses.

Regarding the frequency of the symptoms, the percentage of the total variance explained by the model was 3%, whereas in relation to the severity of the symptoms, the model accounted for 2% of the total

variance. In both cases, anxiety emerged as a significant predictor. Depression did not significantly predict any of these outcomes.

Considering alexithymia, both anxiety and depression significantly and positively predicted this outcome accounting for 7% of the total variance in the regression model. In contrast, with regard to the dimensions of DIF and DDF, anxiety was the only significant predictor of both outcomes since depression did not make any significant contribution. In relation to DIF the model accounted for 6% of the total variance and respecting DDF the model explained 2% of the total variance.

### Discussion

In this study we aimed at determining the prevalence of depression and anxiety in a sample of hypertensive women. We also tested the possible relationship of these two disorders with the frequency and severity of physical symptoms, alexithymia and the dimensions of DIF and DDF.

According to the results, 30% of the sample reported suffering from depression. This percentage is within the range indicated by other investigations that have shown that between 20 and 45% of the total population presenting CVD tend to experience some type of depressive symptoms or depressive disorder [41].

In contrast, the percentage of women who reported suffering from anxiety was notably higher than that observed in the case of depression. Specifically, 65% of the women included in the sample reported having anxiety. This finding supports previous studies [18], although some investigations have indicated that the prevalence of anxiety disorders in people diagnosed with CVD could be lower, ranging between 15 and 20% [17]. Taking into account the greater

**Table 2:** Descriptive statistics of the study variables.

	M (DT)	Range
Depression	6.28 (3.63)	0-20
Anxiety	8.52 (3.67)	0-16
Frequency of Physical Symptoms	2.18 (1.30)	0-5
Severity of Physical Symptoms	8.36 (3.08)	5-19
Alexithymia	52.88 (12.16)	22-86
Difficulty Identifying Feelings (DIF)	14.15 (4.83)	6-29
Difficulty Describing Feeling (DDF)	22.59 (5.38)	9-35

**Table 3:** Intercorrelations among variables.

	1	2	3	4	5	6	7
1. Depression	---						
2. Anxiety	0.56***	---					
3. Frequency Physical Symptoms	0.33***	0.40***	---				
4. Severity Physical Symptoms	0.29**	0.36***	0.80***	---			
5. Alexithymia	0.42***	0.47***	0.40***	0.37***	---		
6. DIF	.34***	.40***	.48***	.51***	.81***	---	
7. DDF	.29*	.36***	.34***	.21*	.68***	.48***	---

\*\*\*p<0.001; \*\*p<0.01.



**Table 4:** Depression and anxiety disorder prevalence.

	N (%)
Depression Disorder	
Yes (score $\geq 8$ )	33 (30%)
No (score $< 8$ )	78 (70%)
Anxiety Disorder	
Yes (score $\geq 8$ )	72 (65%)
No (score $< 8$ )	39 (35%)

**Table 5:** Regression analysis predicting frequency and severity of physical symptoms, alexithymia and the dimensions of DIF and DDF.

	R <sup>2</sup>	F	gl	t	$\beta$
Frequency of Physical Symptoms					
Depression	0.17	11.43***	2,110	0.15	0.15
Anxiety				0.31	2.99**
Severity of Physical Symptoms					
Depression	0.14	9.05***	2,110	0.13	0.24
Anxiety				0.29	2.37**
Alexithymia					
Depression	0.26	18.62***	2,110	2.33*	0.23
Anxiety				3.37**	0.34
DIF					
Depression	0.25	17.91***	2,110	.98	0.9
Anxiety				4.35***	0.44
DDF					
Depression	0.15	9.35***	2,110	1.49	0.16
Anxiety				2.63*	0.27

\*\*\*p<0.001; \*\*p<0.01; \*p<0.05.

prevalence of anxiety in our sample, one could speculate that the detection and diagnosis of anxiety disorders may have been incorrectly made. In this line, it has been suggested that the anxiety symptoms reported by hypertensive patients can be erroneously normalized in the health care settings [17], or be confused with other symptoms specifically associated with hypertension or with the prescribed antihypertensive medication.

The results of the present study also showed that depression and anxiety positively correlated with the frequency and severity of physical symptoms. Nonetheless, and contrary to our hypothesis, when anxiety and depression jointly entered into the regression analysis, only anxiety emerged as the significant predictor of increased frequency and severity of symptoms.

This result may be, at least, attributable to the very nature of the symptoms assessed in the study. These symptoms may have more to do with autonomic arousal (i.e., “palpitations”, “nervousness”, “dizziness” or “respiratory difficulty”) than with other more somatic indicators, such as fatigue, anhedonia or lack of energy, which would be more typical in patients with both a depressive disorder and CVD [42]. Thus, the kind of symptoms included in the investigation would be more consistently linked to the existence of an anxiety disorder, which, in turn, could contribute to perceive the symptoms in a more amplified and threatening way [43].

Although previous research [7,11,13,16,23], has confirmed the negative association of depression and anxiety with the level of well-being experienced by hypertensive patients, most of these studies have only examined the presence of one of the two disorders or have

considered a global measure of distress. Considering this empirical point, the findings of the present study are relevant for two reasons. First, because they allow expand previous evidence by comparing the relative contribution of both depression and anxiety in women having hypertension. And second, because they help to clarify the predictive weight of both disorders in relation to some indicators of reduced well-being, such as the frequency and severity of the physical symptoms.

On the other hand, as expected, we found that both depression and anxiety were positively related to alexithymia and the domains of DIF and DDF, and were also independent and positive predictors of alexithymia. All these results are in agreement with other studies confirming the positive relationship of depression and anxiety with alexithymia in patients with CVD [26,44].

However the results obtained in this study are particularly noteworthy because they provide evidence of the type of relationships among these variables in a sample of hypertensive women and because, overall, research on these psychosocial aspects in hypertensive women is still scarce.

These results also suggest that since the presence of depression or anxiety implies greater psychological vulnerability and a constellation of cognitive, emotional, behavioral and somatic symptoms, hypertensive women who suffered from one of these disorders could also have an impaired ability to identify, process or express a different range of emotions [45], thus showing a higher level of alexithymia. Alternatively, it could be argued that in women suffering from essential hypertension, depression and anxiety may be associated

with alexithymia to the extent that alexithymia may be acting as a form of maladaptive response [26,46]. This inappropriate response could function as a way to cope with the stressful event of suffering from hypertension and its possible negative and severe consequences.

Contrary to our hypothesis and previous studies [32,33], regression analysis showed that the domains of DIF and DDF were only predicted by anxiety since depression did not emerge as a significant predictor of these outcomes. In line with these results one could speculate that women from our study, who also suffered from anxiety, could experience an exaggerated physiological reactivity. This increased physiological response might hinder the ability to identify and distinguish feelings from physical reactions, which could, in turn, lead to experience and report more frequent and severe symptoms. Although this explanation is, however, tentative and requires more empirical evidence to be tested, some investigations have supported the connection between alexithymia and elevations in sympathetic arousal [47].

The present research has a number of limitations that should be noted. First, the variables used in the study were all self-reported. Relying on these self-rated measures can have biased the participants' responses and overestimated the degree of overlap between the variables, particularly the size of the associations between anxiety and the frequency and severity of the symptoms. In addition, it would have been interesting to examine the possible degree of overlap between depression and anxiety in the sample, taking into account that both disorders tend to be strongly related.

Second, some factors, such as comorbid medical conditions and the side effects of prescribed pharmacological treatment, could have negatively affected the prevalence of depression and anxiety, the frequency and severity of the symptoms reported by the hypertensive women and maybe their level of alexithymia and the dimensions of DIF and DDF. Since these variables were not controlled in the investigation, future studies should explore whether the prevalence of depressive and anxiety disorders, and their associations with the symptoms and alexithymia, could change depending of the level of comorbidity and the negative effects due to the pharmacological treatment.

Finally, the cross-sectional nature of this research prevents the establishment of causal relationships between the different variables and the examination of reciprocal effects over time. For example, alexithymia could be also considered as a predictor of depressive and anxiety disorders, and the presence of more symptoms could increase the severity of these mental disorders. Hence, longitudinal studies in which longer time intervals are established should be conducted to clarify these possible reciprocal relations.

## Conclusions

Despite these limitations, our study provides more insight on important issues that remained underexplored in the field of gender differences and hypertension. First, it reports the prevalence of depression and anxiety in women with essential hypertension. Second, it sheds more light on the relevant role that anxiety has in predicting more frequent and severe symptoms, and more difficulty in identifying and describing the feelings. And finally, it illustrates

how both depression and anxiety are independently associated with alexithymia in women with essential hypertension.

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