


## DEPRESSION, ANXIETY, SUICIDAL IDEATION AND FEMALE CLIMACTERIC: A NARRATIVE REVIEW

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### ABSTRACT

Climacteric is the period in a woman's life cycle that involves perimenopause, menopause and postmenopause. It represents the end of the reproductive period and the beginning of female aging in the biological sense. Over the past 10 years, an emphasis has been placed on the study of mental health in the female climacteric. Studies about the prevalence of depression, anxiety, suicidal ideation and association with different factors have shown important results on the relevance of these disorders during female climacteric. Considering the importance of these findings in the field of public health and epidemiology, we conducted a narrative review aiming to discuss the current knowledge about the prevalence of depression, anxiety and suicidal ideation in the female climacteric, analyzing methods and results in different studies, selected from a literature review between 2009 and 2019, in the PubMed, Lilacs, Embase, Web of Science and Google Scholar databases. Our results showed that the methodology, cultural and sociodemographic differences, as well as a variety of biopsychosocial factors studied, generate some uncertainties about the exact relationship between depression, anxiety, suicidal ideation and female climacteric. We conclude that more research, greater methodological rigor, more accurate results and a biopsychosocial view are needed and urgent for effective interventions, cost reduction

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#### Submetido em:

21/12/2019

#### Revisto em:

29/01/2020

#### Aceito em:

31/01/2020

#### Como citar:

Wigg, C. M. D., Carvalho, A. O., Soares, V. L. C., & Marinheiro, L. P. F. (2022). Depression, anxiety, suicidal ideation and female climacteric: a narrative review. *Arquivos Brasileiros de Psicologia*, 74:e018. <http://doi.org/10.36482/1809-5267.ARP-2022v74.19688>



in mental health care, as well as prevention and control of depression, anxiety and suicide in climacteric.

**Keyword:** Climacteric; Depression; Anxiety; Suicidal ideation, Women's health.

## **DEPRESSÃO, ANSIEDADE, IDEAÇÃO SUICIDA E CLIMATÉRIO: UMA REVISÃO NARRATIVA**

### **RESUMO**

O climatério é um período do ciclo de vida da mulher que envolve perimenopausa, menopausa e pós-menopausa. Representa o fim do período reprodutivo e o início do envelhecimento feminino, no sentido biológico. Nos últimos 10 anos, uma ênfase foi dada ao estudo da saúde mental no climatério feminino. Estudos sobre a prevalência de depressão, ansiedade, ideação suicida e de associação com diferentes fatores têm mostrado importantes resultados sobre a relevância dessas desordens durante o climatério feminino. Considerando a importância desses achados no campo da saúde pública e da epidemiologia, elaboramos uma revisão narrativa com o objetivo de discutir o conhecimento atual acerca da prevalência de depressão, ansiedade e ideação suicida no climatério feminino, a partir da análise de métodos e de resultados em diferentes estudos, selecionados a partir de uma revisão da literatura entre 2009 e 2019, nas bases de dados PubMed, Lilacs, Embase e *Web of Science* e no *Google Scholar*. Nossos resultados mostraram que a metodologia e as diferenças culturais e sociodemográficas, bem como uma variedade de fatores biopsicossociais estudados, geram incertezas sobre a exata relação entre depressão, ansiedade, ideação suicida e climatério feminino. Concluímos que uma visão biopsicossocial, mais pesquisas, maior rigor metodológico e resultados mais precisos são necessários e urgentes para efetivas intervenções, redução de custos na assistência em saúde mental e para a prevenção e o controle da depressão, da ansiedade e do suicídio no climatério.

**Palavras-chave:** Climatério; Depressão; Ansiedade; Ideação suicida; Saúde da mulher.

## **DEPRESIÓN, ANSIEDAD, IDEACIÓN SUICIDA Y CLIMATERIO: UNA REVISIÓN NARRATIVA**

### **RESUMEN**

El climaterio es el período en el ciclo de vida de una mujer que involucra la perimenopausia, la menopausia y la posmenopausia. Representa

el final del período reproductivo y el comienzo del envejecimiento femenino en el sentido biológico. Durante los últimos 10 años, se ha puesto énfasis en el estudio de la salud mental en el climaterio femenino. Los estudios sobre la prevalencia de depresión, ansiedad, ideación suicida y asociación con diferentes factores han mostrado importantes resultados sobre la relevancia de estos trastornos durante el climaterio femenino. Considerando la importancia de estos hallazgos en el campo de la salud pública y la epidemiología, realizamos una revisión narrativa con el objetivo de discutir el conocimiento actual sobre la prevalencia de la depresión, la ansiedad y la ideación suicida en el climaterio femenino, analizando métodos y resultados en diferentes estudios, seleccionados a partir de una revisión bibliográfica entre 2009 y 2019, en las bases de datos PubMed, Lilacs, Embase, *Web of Science* y *Google Scholar*. Nuestros resultados mostraron que la metodología, las diferencias culturales y sociodemográficas, así como una variedad de factores biopsicosociales estudiados, generan algunas incertidumbres sobre la relación exacta entre la depresión, la ansiedad, la ideación suicida y el climaterio femenino. Concluimos que más investigación, mayor rigor metodológico, resultados más precisos y una visión biopsicosocial son necesarios y urgentes para intervenciones efectivas, reducción de costos en la atención de salud mental, así como prevención y control de la depresión, ansiedad y suicidio en el climaterio.

**Palabras clave:** Climatérico; Depresión; Ansiedad; Ideación suicida; Salud de la mujer.

## HISTORICAL BACKGROUND

The term "climacteric", originated from the Greek "Klimakter", means "critical point in human life" (Reis, Moura, Haddad, Vannuchi, & Smanioto, 2011). The use of the term climacteric was discussed in 1980 by the WHO Scientific Group on Menopause Research (World Health Organization [WHO], 1981) aiming to verify if the term would be appropriate to describe the phases and periods around menopause. However, according to WHO (1996), the phases and periods around menopause were not being defined and applied with the necessary consistency, and the term climacteric was causing some confusion. Therefore, the International Menopause Society (IMS), considering reducing the different terms used in the field of menopause research and ensuring a standardized definition of the various terms referring to menopause and climacteric, has commissioned a project from the Council of Affiliated Menopause Societies (CAMS) with participation of an expert group from the major regions of the world. Despite the WHO recommendation, the decision was

to maintain the use of the term climacteric and defined it "as the aging phase of women that marks the transition from the reproductive to the non-reproductive state, incorporating perimenopause and extending over a variable period longer before and after perimenopause" (Utian, 1999). As a justification, the IMS considered that the term climacteric was being used for generations, and adequately describes the menopause-related phases (Utian, 1999).

After that, Utian (1999) published a list of menopause-related definitions, as approved by the Board of the IMS in October 1999. The recommendation aimed to internationally standardize terms to avoid terminological misinformation and the misuse of menopause-related terms. The list includes all terms specified by WHO (1996) and also the terms Climacteric and Climacteric syndrome. The term Climacteric was defined: "The phase in the aging of women marking the transition from the reproductive phase to the non-reproductive state. This phase incorporates the perimenopause, by extending for a longer variable period before and after the perimenopause" (Utian, 1999).

The IMS (Utian, 1999) and WHO (1996), defined the phases of the menstrual cycle in: premenopause, perimenopause, menopause, and postmenopause. Premenopause can be understood as a period of menstrual regularity, which covers the last twelve months until menopause, or the entire reproductive period, until the final menstrual period. When menstrual cycles become irregular and shorter, with longer gaps between cycles, perimenopause begins. Perimenopause was defined as the period before menopause, when biological, endocrinological and clinical changes occur, and the first year after menopause. Menopause is the phase in which permanent cessation of menstruation occurs due to loss of ovarian follicular activity, representing the phase of the last 12 consecutive months without menstruation and occurring with final menstrual period, around 50 year-old women. There is no good biological marker that determines menopause. After the last 12 consecutive months without menstruation, postmenopause begins, representing final menstrual period, regardless of whether menopause has been induced or spontaneous (Utian, 1999; WHO, 1996). Based on the IMS recommendation, these phases make up the definition of climacteric.

During the climacteric, as a consequence of the gradual decrease in estrogen levels, vasomotor and physical symptoms appear, such as hot flashes, night sweats, sleep disorders, cardiovascular problems, urogenital atrophy, osteoporosis, among others (Bień, Rzońca, Iwanowicz-Palus, & Pańczyk-Szeptuch et al., 2015; Iwanowicz-Palus, Stadnicka, & Bien, 2013). Some other important events that may be present in female climacteric experience

are the beginning of retirement, the departure of children from home, stagnant marital relationships, feeling of emptiness resulting from the loss of their youth, attractiveness, and lack of social and professional roles (Bień et al., 2015; Iwanowicz-Palus et al., 2013). Similarly, the presence of depression, anxiety, stress, suicidal ideation, neuroticism, as well as memory and attention deficits have been described in several studies (Chou, Ko, Wu, Chang, & Tung, 2015; Kruif, Spijker, & Molendijk, 2016; Fernandes, Silva, Bonan, Zahar & Marinheiro, 2009; Flores-Ramos et al., 2019; Georgakis et al., 2016; Kornstein et al., 2010; Lee & Moon, 2016; Polisseni et al., 2009; Soares, 2017; Wie et al., 2019; Wigg, 2017). All of these occurrences, combined or not, may require great effort to overcome, endangering woman's mental health (Wigg, 2017).

In addition, depression and anxiety have been the most commonly cited mental disorders in female climacteric mental health studies (Chou et al., 2015; Kruif et al., 2016; Fernandes et al., 2009; Flores-Ramos et al., 2019; Georgakis et al., 2016; Kornstein et al., 2010; Lee & Moon, 2016; Polisseni et al., 2009; Soares, 2017; 2019; Wie et al., 2019; Wigg, 2017). According to the WHO (2017), depression and anxiety are common mental disorders due to their high occurrence in the world population, and their highest prevalence is among women, with a peak between 55 and 74 years and between 35 and 54 years, respectively. Age has been studied as one of the factors associated with the most severe depression among women, such as physical health, anxiety and hormonal status (Weiss et al., 2016).

Other factors, besides age and gender, appear to contribute to the incidence of common mental disorders such as poverty, unemployment, death of a loved one or a relationship breakdown, physical illness and problems caused by alcohol and drug use. Common mental disorders lead to considerable losses in health and daily living activity, reducing productivity and increasing government costs for public health (WHO, 2017). Therefore, sociocultural, demographic and economic factors need to be studied within the climacteric period because they may overlap with climacteric symptoms, increasing the risk of depression and anxiety (Soares, 2019).

Although WHO (1996) defines *menopause* as a natural and biological life phase and not a pathological process, the *climacteric* is often experienced as pathological and with significant losses (Freitas & Barbosa, 2015; Souza et al., 2017), moreover producing an experience marked by the interaction of biological, psychological and social factors that influence women's well-being and quality of life (Bień et al., 2015; Iwanowicz-Palus et al., 2013). In this context, climacteric

represents a period of important changes in women's lives, and is not always experienced naturally. In addition, with increased life expectancy, women have been living through postmenopause longer. With this, postmenopause became more important and aroused the interest of researchers and specialists in women's public health policies (WHO, 1998). According to WHO (2005), by 2030 around 1.2 billion women will be in menopause, reaching an annual margin of 47 million.

From the nature and the participation of factors that are related to the climacteric, explanatory models were formulated about the relationship between the climacteric, health and illness and associated factors. In general, four models that seek to explain the discomfort and problematization involved in the female climacteric are identified. The first one is the biomedical model, involving biological or physical symptoms of an endocrine dysfunction (Bergner, Bobbitt, Carter & Gilson, 1981; Rostosky & Travis, 1996) and a treatment that can compensate for hormonal losses (Reynolds, 1997). The second is the sociocultural model that understands the climacteric as a natural and minor turbulent process, with discomforts that arise from cultural construction, associated with stereotypes and attitudes related to aging and the loss of social roles (Hunter & O'Dea, 2001). Climacteric and aging are confused and the idea of aging is anticipated (Serrão, 2008). The third model is the psychosocial one, whose approach deals with the vulnerability present in the climacteric, determined by hormonal factors and factors that generate stress, such as the empty nest syndrome, absence of a partner at home, grief, conflicts and health problems, among others. Additionally, stress factors, combined with hormonal vulnerability, are seen as more important for the onset of depressive symptoms than hypoestrogenism itself (Gordon et al., 2015; *The Social and Psychological Origins of the Climacteric Syndrome*, 1985). Finally, the biopsychosocial model has a broader view of health, highlighting the importance of biological, cultural and psychosocial factors in order to maintain women's health. In such a way that the conflict experienced by women in the climacteric is determined by several determinants: biological, cultural and psychosocial (Greenblum, Rowe, Neff & Greenblum, 2013; Hanisch, Hantsoo, Freeman, Sullivan & Coyne, 2008).

Considering that climacteric may not be a calm period for women's health and the importance of better understanding the participation of the factors that have been related to the emergence and worsening of mood disorders and anxiety in the climacteric, we conducted a narrative review in the field of epidemiology and public health, on depression, anxiety, suicidal ideation and female climacteric. The aim was to present the current state of knowledge

about the theme; highlighting prevalence data, diagnostic tools and methods used, and associations between physical, psychological, sociodemographic and economic factors.

## **METHOD**

The present study was a narrative review, defined by Rother (2007) as a broad-issue publication, detailing description and discussion of the state of the art of a given subject. Narratives do not present replicable methodologies or quantitative answers to specific questions, but they can add to the debate, raising questions and collaborating in the capture and updating of knowledge about the theme (Rother, 2007).

Thus, a non-systematic literature review was conducted from June to December 2019. PubMed, Web of Science, Lilacs, Embase and a Google Scholar search tool were used as a scientific database. A search was performed with the descriptors "climacteric", "menopause", "perimenopause", "premenopausal", "postmenopausal", "depression", "anxiety" and "suicide", in addition to the value of the suffix. As a way of delimiting the search, search filters related to the period of publication (2009–2019) were used; language of publication (English, Portuguese and Spanish); and gender of the studied population (female). The selected materials were thoroughly read and critically analyzed. Google Scholar alerts have been added according to the requirements described above.

## **RESULTS AND DISCUSSION**

### **DEPRESSION IN THE FEMALE CLIMACTERIC**

According to WHO, depressive disorders are characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, fatigue feelings, and poor concentration. Depression can be long-lasting or recurrent, substantially impairing an individual's ability to function at work or school or cope with daily life. At its most severe state, depression can lead to suicide. Depressive disorders include two main sub-categories: major depressive disorder / depressive episode and dysthymia (WHO, 2017).

During female climacteric, depressive symptoms are very common and changes in menopausal status throughout a woman's life may be associated with an increased risk of depressive symptoms (Georgakis et al., 2016; Natari, Clavarino, McGuire, Dingle, & Hollingworth, 2018; Soares, 2019; Wigg, 2017;

Worsley, Bell, Kulkarni, & Davis, 2014). Campagne (2012), pointed to the existence of a "window of vulnerability" for depression during the menopausal transition, where an increase in the intensity of depressive symptoms is observed, although there is no clear evidence to associate menopause to depressive disorder. Age can be considered a predictor of depression (Weiss et al., 2016; WHO, 2017), aging increases the frequency of depressive symptoms, and in the women's case, the menopausal status has been studied as a risk factor for depressive symptoms (Bromberger & Kravitz, 2011; Kruif et al., 2016). The influence of aging on depression is related to hormonal changes and their impact on women's biochemical profile (Weiss et al., 2016), but may also be related to psychological and social aspects that occur in the same period of life (Pardo, Finkle, Gonzalez Torres & Gaviria, 2013).

Cross-sectional studies have been using different instruments to measure the degree and prevalence of depression. Eastern studies such as Park and Choi (2019) used the Korean version of the Patient Health Questionnaire (PHQ-9), a 9-item questionnaire answered by 1,372 postmenopausal Korean women whose average age was 63.4 years and the prevalence was 10.6%. Jung, Shin and Kang (2015) used the Korean version of the Center for Epidemiologic Studies Depression Scale (CES-D) in 60,114 women over 52 years, finding a depression prevalence rate of 5.9%. Zong et al. (2016) evaluated 1397 postmenopausal Chinese women over 50, using the "Beck Depression Inventory (BDI)", having considered as a cutoff point higher scores and the prevalence found was 35.4%. Wang et al. (2016) applied the Hamilton Depression Scale (HAMD) to 32 postmenopausal Chinese women, with an average age of 53.9 years, having confirmed a previous diagnosis of depression in 19 women and 59.4% of prevalence. Zang, He, Chen, Ge and Yao (2016) used the "Self-rating Depression Scale (SDS) - Zung method" to study depression in 743 women between 40 and 60 years before, peri and postmenopause, and found a prevalence of 11.4%. In Taiwan, Chou et al. (2015) in a study of 190 women between 40 and 60 years old, used the Ko's Depression Inventory (KDI) and found a prevalence of 7.9%.

In western cross-sectional research, Perquier, Lasfargues, Mesrine, Clavel-Chapelon and Fagherazzi (2014) studied 41,114 French women with an average age of 63.9 years through the French version of the Center for Epidemiologic Studies Depression Scale (CES-D), and applied the cut-off point of 23 and found a prevalence of 15.4%. Wariso et al. (2017) conducted a study with 141 perimenopausal American women aged 40 to 60 using the American version of the Center for Epidemiologic Studies Depression Scale (CES-D) and as a significant outcome for depression severity above moderate



(score above 16). The results showed previous depression in 90 women and a prevalence of 63.8% was verified. Weiss et al. (2016) used the "Quick Inventory of Depressive Symptomatology - Self-Report" on a sample of 298 women with a mean age of 43. Results showed that 37.5% of the sample showed severe or very severe symptoms of depression, while 62.5% had between no depressive symptoms and moderate symptoms of depression. Factors such as age, physical morbidity and anxiety correctly predicted 76% of cases, whether or not they had symptoms of severe depression. Polisseni et al. (2009) conducted a study with 93 Brazilian women, 31 pre-menopausal, 32 perimenopausal and 30 postmenopausal. The author applied the "Beck Depression Inventory (BDI)" with the cut-off point 15. The results pointed to a prevalence of 22.6% of premenopausal depression, 46.9% of perimenopause and 40.0% of postmenopausal depression, considering on the total sample, the prevalence was 36.8%.

A tendency towards a higher prevalence of depression among western women can also be observed, ranging from 15.4% (Perquier et al., 2014) to 37.5% (Weiss et al., 2016) when the studied sample does not possess a previous diagnosis of depression, and confirms 63.8% prevalence when there is a previous diagnosis (Wariso et al., 2017). The prevalence of depression in oriental women has been lower, ranging from 5.9% (Jung et al., 2015) to 11.4% (Zang et al., 2016), in the case of absence of previous diagnosis. However, a prevalence of 54.9% has been reported in women previously diagnosed with depression (Zong et al., 2016). Studies on depression in western and eastern women seem to say that previous diagnosis of depression is a risk factor for higher prevalence of depression in the climacteric.

Besides the previous history of mood instability or depressive symptoms, other risk factors for the onset of climacteric depression have been reported (Jadresic, 2009; Pardo et al., 2013; Wariso et al., 2017; Zong et al., 2016). Such as: history of premenstrual syndrome, prolonged perimenopause (more than 27 months), vasomotor symptoms, surgical menopause (hysterectomy or oophorectomy) (Azizi, Fooladi, Abdollahi & Elyasi, 2018; Jadresic, 2009; Pardo et al., 2013); lower socioeconomic and educational level (Jadresic, 2009; Pardo et al., 2013); chronic diseases (Azizi M. et al., 2018; Jadresic, 2009); insomnia, anxiety sexual and urogenital problems (Pardo et al., 2013); history of postpartum depression, thyroid dysfunction and having suffered significant losses (such as becoming widowed or divorced) (Jadresic, 2009). Some of these risk factors are considered as common symptoms of the perimenopause period and are related to typical hormonal changes of this period due to falling estrogen levels

and fluctuations in estradiol levels that affect serotonin levels (Pardo et al., 2013). Among these factors are vasomotor symptoms, sleep disorders, sexual difficulties, loss of bone mineral density, and impaired cognitive function. Estrogen levels also influence noradrenaline and dopamine levels, which are decreased in depressive conditions, and there are receptors of estrogen in the hypothalamus, pituitary gland and limbic system, indicating that estrogen may directly influence mood (Jadresic, 2009). The type of menopause can also influence the occurrence of depression, as women who have experienced surgical menopause are more prone to depression (Azizi M. et al., 2018). In this case, the fall of estrogen is even more sudden (Jadresic, 2009).

Comorbidity between anxiety, anxiety disorders and depression is noticeable during climacteric. Anxiety disorders usually precede depression and have also been shown to be good predictors of major depression episodes (Weiss et al., 2016). Women with anxiety may have up to four times higher risk of depression, while depressed women with up to five times higher risk of anxiety and the occurrence of depression and anxiety are significantly related to the presence of moderate climacteric symptoms (Polisseni et al., 2009). Sleep disturbances related to hot flashes and night sweats may also influence the occurrence of depression (Azizi M. et al., 2018) and insomnia has a strong relationship with depression (Polisseni et al., 2009). Vasomotor symptoms are related to difficulties in maintaining sleep because they cause discomfort and various sleep interruptions, while depression is related to difficulty in falling asleep (sleep latency) and also awakening very early (Voursora et al., 2015).

Severe health conditions (cancer, chronic pain, among others) may be present during menopause, influencing the occurrence of depressive symptoms and higher risk of suicide (Campagne, 2012; Weiss et al., 2016). Substance abuse can also be related to depressive symptoms, equally for medications (antidepressants, anxiolytics, contraceptives, etc.) as well as for the use of consumer drugs such as alcohol and tobacco, since alcohol dependence is a confirmed predictor of depression because it reduces serotonin activity (Campagne, 2012).

In addition to physical symptoms, subjective complaints such as "feeling old" are common, especially when symptoms associated with climacteric such as joint pain or stiffness manifest themselves (Pardo et al., 2013). Dissatisfaction with body image is also related to depression (Campagne, 2012). Perquier et al. (2014) found an association between overweight in women aged 35 to 40 years with the occurrence of depression. Women who were

overweight throughout their lives were more likely to develop depression in the climacteric period. Psychosocial factors also influence the onset of depressive symptoms and depressive symptoms contribute significantly to the decline in quality of life, as climacteric is a period of experiences that may contribute to the development of depression (Wariso et al., 2017). The climacteric period is prone to negative experiences such as loss of important affective relationships, separation, divorce or widowhood, death of parents and children leaving home (empty nest syndrome) (Jadresic, 2009). Women with lower socioeconomic and educational status tend to have a higher risk of depression and the need to return to work to supplement their income after retiring is a predictor of depression symptoms (Jadresic, 2009). Being unemployed is also a risk factor for depression (Campagne, 2012). Depressive symptoms may be related to a negative attitude towards the experience of menopause, as well as perceived social support (Pardo et al., 2013).

According to Murphy, Verjee, Bener and Gerber (2013) Qatar's climacteric women consider menopause an emotional time when they need to feel cared for and welcomed by their family, turn to their relationship with their husbands and express the fear that they will remarry or no longer find them attractive. They see the protection they receive in their homes as positive and believe that the experiences of Western women at this stage are quite different in the way that they have a more independent lifestyle. Pardo et al. (2013) pointed out the importance of considering women's cultural environment, depressive symptoms may be more frequent in societies where menopause has more negative social connotations, such as in Europe, where aging is not perceived as good for women. In contrast to what happens in Japan, where the aging woman is valued, women are given greater respect and authority.

Good social and family support, as well as job satisfaction can be a protective factor for women, the quality of the relationship with the partner is very important in this regard, emotionally and sexually, as changes in estradiol levels can affect the sexual experience (Pardo et al., 2013). Kalmbach, Pillai, Kingsberg and Ciesla (2015) demonstrated that affective symptoms such as anxiety and depression can be predictors of sexual difficulties. The severity of depressive symptoms can lead a woman to anhedonia, where subjective sexual desire as well as natural lubrication may be impaired.

Climacteric is identified as a risk factor for depression. Biological aging is associated with hormonal changes that alter the woman's biochemical profile, creating what some authors call the "window of vulnerability"

(Campagne, 2012; Soares, 2019), during which, an increase in the intensity of depressive symptoms is observed, although the evidence of association between menopause and depression are not entirely clear. The climacteric phases that comprise perimenopause, menopause and postmenopause are also frequently marked by important social and psychological changes and these can also be related to the occurrence of depression. The different cross-sectional studies analyzed in this review aimed to measure the degree and prevalence of depression in climacteric women using various instruments, so from these studies it was possible to verify a higher prevalence of depression in western climacteric women, which seems to indicate the relevance of the context for the emergence of depression. The prevalence in western samples (15.4% to 37.5%) was higher than in oriental samples (5.9% to 11.4%), likely occurring cultural and sociodemographic influence. Studies also indicated that previous history of depression is a significant predictor of depression during menopause-related phases. Another important point in the study of depression in these samples was the variety of risk factors, ranging from clinical factors such as hormonal fluctuations, vasomotor symptoms, surgical menopause (caused by hysterectomy or oophorectomy), comorbidities with serious diseases such as cancer and osteoporosis, to neuropsychic factors such as high levels of anxiety and insomnia, as well as factors such as substance abuse, social vulnerability and self-esteem issues. Given the complexity of the factors that can lead climacteric women to a depressive condition and the possible existence of a greater biological vulnerability for this condition to be established, the ideal is that women in the climacteric are assisted in a personalized way, in order to enable the prevention of depression, considering the specificities of each case.

### **ANXIETY IN THE FEMALE CLIMACTERIC**

"Anxiety" is a general term capable of encompassing important distinctions between anxiety symptoms and anxiety disorders. Anxiety symptoms include several manifestations such as concerns, fears and physiological arousals that cause discomfort to the individual (Bryant, Judd & Hickey, 2012). In the WHO definition "anxiety disorders refer to a group of mental disorders characterized by feelings of anxiety and fear, including generalised anxiety disorder (GAD), panic disorder, phobias, social anxiety disorder, obsessive-compulsive disorder (OCD) and post-traumatic stress disorder (PTSD). As with depression, symptoms can range from mild to severe. The duration of symptoms typically

experienced by people with anxiety disorders makes it more a chronic than an episodic disorder." (WHO, 2017).

In female climacteric, anxiety is one of the most frequent and relevant neuropsychic symptoms (Jafari, Hadizadeh, Zabihi & Ganji, 2014; Nunez-Pizarro et al., 2017; Sahingoz, Uguz & Gezginc, 2011; Yisma, Eshetu, Ly & Dessalegn, 2017). In a study on mood disorders in postmenopausal women, based on the diagnostic criteria of the Diagnostic and Statistical Manual of Mental Disorders - 4th Edition (DSM IV), a prevalence of 23.8% of anxiety disorders was observed, and generalized anxiety disorder was the most prevalent (15.6% of cases) (Sahingoz et al., 2011). The results of the multicenter and cross-sectional study by Núñez-Pizarro JL et al. (2017), conducted in postmenopausal women between 40 and 59 years old, from 11 Latin American countries, indicated the prevalence of anxiety symptoms in 61.9% of the sample, using the scale "The Goldberg Depression and Anxiety Scale". In a cross-sectional study with premenopausal and postmenopausal women using the Zung Anxiety Scale (ZAS), Jafari et al. (2014) found 49.5% of anxiety among the 218 women studied. Using the same instrument and phases of the climacteric, Freeman and Sammel (2016) identified 36.6% of anxiety in their longitudinal study with 233 women. Another instrument used to assess the symptom was the Hospital Anxiety and Depression Scale (HADS), used in cross-sectional studies by Polisseni et al. (2009) and Terauchi et al. (2013), and the prevalence of anxiety was 53.7% and 14.3%, respectively.

Studies suggest that climacteric is a period of high risk for anxiety onset or worsening, bearing rates higher than those found in the general female population (Bryant et al., 2012; Jafari et al., 2014; Sahingoz et al., 2011; Terauchi et al., 2013). According to Pereira, Schmitt, Buchalla, Reis and Aldrighi (2009), at this stage of life, women become more vulnerable to anxious conditions, which may be associated with the progressive reduction over the years of physiological levels of estrogen, a steroid of anxiolytic action. In this cross-sectional study of 749 women from all climacteric phases, the Beck Anxiety Inventory (BAI) was used and identified a prevalence of 16.6% of anxiety (Pereira et al., 2009).

Regarding the relationship between anxiety and menopausal status, the relationship of anxiety with a specific period, most strongly associated with postmenopause, has been highlighted. Catalano et al. (2018) studied 192 postmenopausal women with the Hamilton Anxiety Rating Scale (HAMA) and identified the presence of anxiety in 18.5% of them, also pointing out that anxiety

levels are significantly related to the age of women, age of menopause and time of menopause. Jafari et al. (2014), in a study on the comparison of depression, anxiety, quality of life, vitality and mental health between premenopausal and postmenopausal women, found that postmenopausal women had higher levels of anxiety compared to women in premenopausal.

Yisma et al. (2017), studying 226 Ethiopian women in perimenopause and postmenopause, found that somatic symptoms were the most prevalent (65.9%), followed by psychological (46.0%) and urogenital symptoms (30.5%). These authors indicated that the most common specific symptoms were hot flashes (65.9%), difficulty falling asleep (50.0%), depressive moods (46.0%), irritability (45.1%) and anxiety (39.8%). An analysis by Terauchi et al. (2013) on the associations between anxiety and somatic, urinary and vasomotor symptoms, indicated stronger correlations between somatic symptom scores and anxiety scores than urinary or vasomotor symptoms. In a Brazilian study, using a cross-sectional methodology with 184 women in the climacteric phases, the most prevalent menopausal symptoms were nervousness (73.9%), skin changes (66.8%), anxiety (60.9%), hot flashes (57.6%), hair loss (49.5%) and hypertension (26.1%) (Menezes, Oliveira, Menezes & Oliveira, 2016). Freeman and Sammel (2016) observed through longitudinal analysis that 72% of the women evaluated had moderate to severe hot flashes. These authors also pointed out that the levels of this symptom were significantly associated with anxiety scores. In this analysis, somatic anxiety scores significantly predicted the risk of hot flashes, with an increase in the risk of presenting this symptom by 69% for each point increased in the average somatic anxiety scores. The affective dimension of anxiety did not present significant correlation with the manifestations of hot flashes.

The study by Catalano et al. (2018) conducted with 192 postmenopausal women, with a mean age of 67.5, analyzed the impact of anxiety levels on bone health, identifying evidence that anxiety is a predictive factor in the reduction of bone mineral density. In this sense, Erez, Weller, Vaisman and Kreitler (2012) analyzed the relationship between depression, anxiety, stress and bone mineral density in a cross-sectional study with 135 postmenopausal women. The results indicated strong evidence of an association between depression and bone mineral density; and partial evidence of correlation between anxiety, stress and reduced bone mineral density. The authors also observed significant positive correlations between anxiety, depression and stress symptoms, data corroborated by Catalano et al. (2018), who also identified a significant association between anxiety symptoms and depressive symptoms.

From the presented scenario, it is emphasized that climacteric women live particular experiences, so that the broad understanding of the symptoms manifested in this period contributes to the improvement of these women's quality of life, especially considering that anxiety is associated with distress and impairment of quality of life in this phase (Bremer, Jallo, Rodgers, Kinser, & Dautovich, 2019; Jafari et al., 2014; Muslic & Jokic-Begic, 2016; Nunez-Pizarro et al., 2017; Polisseni et al., 2009). According to Muslic and Jokic-Begic (2016), the presence of traits of anxiety and sensitivity to anxiety may play an important role in predicting distress experiences during climacteric. Adequate prior guidance on the possibility of manifestations of anxiety may represent an instrument of intervention and reduction of indices of this symptom during female climacteric (Bremer et al., 2019; Enggune, Purba, & Kakumboti, 2019; Silva, Freire, & Nascimento, 2019).

Anxiety is one of the most prevalent symptoms in climacteric, and postmenopause can be considered the phase where anxiety symptoms are most strongly associated. The studies analyzed in this review were predominantly cross-sectional, with samples of postmenopausal women. In addition, self-administered measuring instruments were predominantly used to assess anxiety symptoms and not anxiety disorders. The results generally suggested that the climacteric is a period of high risk for the onset or worsening of anxiety, and showed a prevalence of anxiety symptoms around 40%. Regarding menopausal symptoms, the strongest correlations were between anxiety and somatic symptoms, especially hot flashes, which may have somatic anxiety as a risk factor. Other factors significantly associated with anxiety were stress, depression, quality of life, and bone mineral density. Women live very particular experiences during climacteric and the presence of anxiety symptoms is associated with distress and poorer quality of life.

### **SUICIDAL IDEATION, SUICIDE ATTEMPTS AND SUICIDE IN THE FEMALE CLIMACTERIC**

Suicidal ideation, as well as the risk of suicide, is a serious and complex multifactorial mental disorder. In women, suicidal behavior is often associated with age, high level of stress, presence of depression symptoms, high level of anxiety, oscillations and decrease in hormonal status, alcohol use, smoking, poor physical activity, absence of work activity, presence of chronic diseases, body mass index, low level of education and household income. Regarding marital status, in general, there is a greater risk among women who are not married or do not live with a partner. Pre-existing mental health problems,

including mood disorders, also show an important association with suicidal ideation (Baca-Garcia et al., 2010; Flores-Ramos et al., 2019; Hahn et al., 2017; Ju et al., 2016; Kim et al., 2013; Lee et al., 2016; Usall et al., 2009; Weiss et al., 2016; Wie et al., 2019).

Oscillations in the estrogen level, typical of the climacteric period, affect the serotonergic and noradrenergic systems and may cause changes in mood, cognition and behavior (Lee et al., 2016). Low estrogen level results in decreased serotonergic function and increased impulsivity and the risk of suicidal ideation and behavior (Baca-Garcia et al., 2010; Lee et al., 2016). Studies differ regarding the climacteric period where the risk of suicide becomes more prevalent, some have observed that postmenopausal women are at higher risk of suicide than younger women (Wie et al., 2019). Other studies have indicated that the risk of developing depression is greater during perimenopause and found a greater association between suicidal ideation and perimenopause than in any other phase of female climacteric (Usall et al., 2009).

Kornstein et al. (2010), found that premenopausal and perimenopausal women were approximately twice as likely to report a past suicide attempt than postmenopausal women. However, Lee et al. (2016) found that postmenopausal women receiving HRT, especially for more than 10 years, showed increased suicidal ideation compared with postmenopausal women without HRT. The authors recommended that physicians should pay attention to mood symptoms and suicidal ideation in postmenopausal women with HRT.

The diagnosis of ideation or suicidal behavior in the climacteric has been made from different instruments and clinical models. One of the criteria used has been the previous clinical diagnosis (Lee et al., 2016) or the diagnosis made by the psychiatrist at the time of the study, using the DSM-IV criteria (Flores-Ramos et al., 2019). Many studies have applied self-report interviews or self-reported questionnaires (Hahn et al., 2017; Ju et al., 2016; Kim et al., 2013; Lee et al., 2016; Usall et al., 2009; Weiss et al., 2016; Wie et al., 2019). Among the validated instruments used were the "Quick Inventory of Depressive Symptomatology - Self-Report", with strong correlation with the Hamilton Rating Scale for Depression (Weiss et al., 2016); the Spanish version of the "Mini-International Neuropsychiatric Interview (MINI)"; Holmes and Rahe's social adjustment scale; Barratt Impulsiveness Scale - modified version ; "Brown - Goodwin Aggression Scale" ; Beck's Suicidal Intent Scale (Baca-Garcia et al., 2010); "17-item Hamilton depression rating scale" (Flores-Ramos et al., 2019) and the Korean version of



the "Mini International Neuropsychiatric Interview's (M.I.N.I.) suicidality module" (Kim et al., 2013).

The presence of mood disorders or comorbid mood (Usall et al., 2009) and anxiety disorders (Usall et al., 2009; Weiss et al., 2016) were also associated with increased likelihood of suicidal ideation. Usall et al. (2009) in his study of 21,425 pre, peri and postmenopausal women from Belgium, France, Germany, Italy, Netherlands, and Spain, found that 7.8% women in perimenopause reported suicidal ideation as opposed to 1% of women in postmenopause. Weiss et al (2016), in her study of 298 pre and postmenopausal American women, found that women at high risk of suicide also had a high rate of anxiety, while those at low risk of suicide had a lower anxiety score. The results indicate that a woman's level of anxiety was the strongest predictor of her likelihood of having severe depression, including thoughts of death or suicide. The authors found another significant predictor of severe depression, which was the number of reported physical health problems. The health problems most associated with the risk of severe depression were stomach ulcers / diseases, neurological disorders and back pain. The study did not point to hormonal status as a significant predictor of reported suicidal ideations or attempts, as 12% of all perimenopausal women were classified in risk of suicide as well as 18.5% of all premenopausal women who reported regular menstruation. However, the authors noted that 33% of women who had their ovaries or uterus surgically removed were in the high-risk suicide group, while no pregnant women were in this group. Other authors have found that suicide risks increase due to low estrogen and progesterone levels (Baca-Garcia et al., 2010).

Studies using samples from middle-aged Korean women highlighted the association of different factors with suicidal behavior. Hahn et al. (2017) analyzed a sample of 4,010 postmenopausal Korean women, where 22.1% had depression and 27.4% suicidal ideation and analyzed 4,836 premenopausal South Korean women, where 16.4% had depression and 18.5% had suicidal ideation. In this study, mental health problems such as depression and suicidal ideation were strongly associated with loss of bone mineral density (BMD) in both groups. Wie et al. (2019) found in a study of 5,131 postmenopausal Korean women that 21% reported suicidal ideation, while 0.8% reported attempted suicide during the year of study. In this study, the correlation between abortion and suicidal ideation or suicide attempt was more significant among women who experienced induced abortion 3 times or more. The influence of hormonal status on suicidal ideation was analyzed by Lee et al. (2016) who observed in a sample of 2,286 Korean postmenopausal women that 25% of

women using hormone replacement therapy (HRT) had both depression and suicidal ideation, 20% had only suicidal ideation, 20% had only depression and just over 15% had no suicidal ideation or depression. Ju et al. (2016), conducted a cross-sectional study using data from the Korea National Health and Nutrition Examination Survey (2008–2012) consisting of 6,621 individuals 40 years of age or older. The authors associated weight control failure with suicidal ideation. The data showed that, among obese participants, 9.4% of men had suicidal ideation as opposed to 20.6% of women, also the behavior was similar among overweight participants, where 10% of men had suicidal ideation, in contrast to 17.5% of women. It was observed that participants who had experienced unsuccessful attempts to control weight were also more likely to report suicidal thoughts.

Studies on the prevalence of suicidal ideation, suicidal thoughts and suicide are not very expressive, and show that there is no consensus on climacteric phases at higher risk for such conditions. The relationship between suicidal ideation and climacteric is still not entirely clear, considering the variety of biopsychosocial factors and conditions that could spark suicidal thoughts (Wigg, 2017). However, although we may not state that lowering estrogen levels leads to depression, we must consider that metabolic and hormonal factors may be associated with increased mood regulation, leading to increased risk for depression during menopause (Berent-Spillson et al., 2017), and increased risk of suicidal ideation.

Suicidal ideation, suicidal thoughts or suicide attempts are symptoms of severe mental illness and risk of suicide. Factors that may contribute to the onset or increased risk of suicide are very varied and also complex. In the literature, we often find this risk associated with mood disorders, the presence of severe comorbidities, the diagnosis of major depressive disorder and a sharp drop in estrogen and progesterone levels. The cross-sectional studies analyzed indicated diagnosis of suicidal ideation or suicidal behavior using different self-report instruments or clinical interviews. Premenopause and perimenopause were related to a higher risk of suicidal ideation and depression, while postmenopause was related to a higher risk of suicide. A single study found that ongoing HRT for more than 10 years may increase the risk of suicidal ideation among postmenopausal women. Korean studies showed a prevalence of suicidal ideation around 20% while western studies showed prevalence between 1% and 12%. Different studies have shown that social factors such as income, employability as well as psychological issues such as self-esteem and self-image may be important factors for suicide risk.

Due to the severity of the problem and the variety of factors that can cause such a problem, it is necessary to follow up frequently and in an individualized way, women who may present this risk.

## **FINAL CONSIDERATIONS**

Women show a greater vulnerability to develop lifespan mental disorders (Friedman, Prakash, & Moller-Olsen, 2018), showing around twice the risk of developing depression than men (Bromberger & Kravitz, 2011). In menopause, decreasing estrogen levels may correlate with increased mood symptoms, physical symptoms, and psychotic symptoms (Friedman et al., 2018), showing that mental disorders can follow the climacteric stages and deserve attention. Demographic and psychosocial factors, high levels of anxiety and stress, previous diagnosis of depression and physical health conditions are also among the most cited and possible predictors of depression and suicidal ideation in the climacteric (Soares, 2019; Wariso et al., 2017; Weiss et al., 2016). In addition, what makes the climacteric a more complicated period may be not exactly the severity of climacteric symptoms but the woman's perception of this severity. Silva, Rocha and Caldeira (2018), revealed a high prevalence of negative self-perceived health (regular or poor health) among menopausal women, with an increase in the prevalence of worse self-perceived health in relation to postmenopausal women. These aspects express the biopsychosocial characteristic of climacteric, that is, different factors that can act at the same time, making climacteric a period of greater vulnerability to the onset of mood disorders (Soares, 2019).

Despite the undeniable changes and turbulences experienced during the female climacteric, pointed out and discussed by several researchers, we still have a certain lack of methodological rigor that casts doubt on the relationship between common mental disorders and climacteric. We highlight here the different diagnostic tools and methods used, as well as cultures and sample sizes. The variability of factors associated throughout the climacteric period are also factors that are strongly associated with depression, anxiety and suicidal ideation in other periods of life, thus not being an exclusive climacteric. Therefore, we emphasize that the cultural, demographic and methodology differences between samples, as well as the variety of biopsychosocial factors studied, characteristic of this phase of women's life, generate many uncertainties about the exact relationship between depression, anxiety and suicidal ideation with climacteric. This

calls for more research and greater methodological rigor in women's mental health studies during climacteric.

Although climacteric is a natural part of a woman's life, literature worldwide points to many problems during this period (Bieñ et al., 2015). It is important that researchers contextualize the climacteric period, not attributing the presence of neuropsychic symptoms, such as depression, anxiety and suicidal ideation, exclusively to hormonal and physical changes. Socio-cultural and demographic factors, the role of women in a given society and the social representation of aging, are issues that deserve attention. Likewise, psychosocial aspects are intimately involved in the problem of changes caused by climacteric, a greater hormonal vulnerability associated with life stressors can weaken women. Stressful events can also impair sleep quality, or overlap the presence of sleep disorders, for example. All these aspects and how they relate can make the climacteric a more or less critical period for women. The window of vulnerability that opens up in the female climacteric does not seem to be just hormonal, because middle-aged women experience conflicts of other orders as well, which requires a multidisciplinary, comprehensive look and careful analysis, in order not to over-rationalize something which is also subjective. In dialogue with Bremer et al. (2019), we consider that each woman experiences biopsychosocial changes throughout the climacteric in a very particular way, therefore deserving personalized, humanized and unique assistance, in order to have as a goal the promotion of the woman's well-being and quality of life.

Naturally, the climacteric is configured as a period of vulnerabilities and a biopsychosocial view seems to be the most appropriate to understand the nature of the relationships among so many symptoms and associated factors. Therefore, it is important to highlight that the woman in climacteric needs to be understood in all its dimension of symptoms, perceptions and care. To take care of the health of women in menopause it is necessary to understand health as complete well-being of a person, promoting attention to physical, mental and social symptoms. This view converges with the WHO definition of health (WHO, 1993), considered physically, mentally, and socially as a complete state of well-being, harmonizing with the environment. Therefore, there is no way to ignore the promotion of mental well-being, moreover it should be considered a priority, as well as the prevention of mental disorders, diagnosis, treatment and rehabilitation (WHO, 2001).

Concluding our discussion, we consider that climacteric can have a major importance in women's health in the field of epidemiology and public health and

we recommend the monitoring of depression, anxiety and suicidal ideation as an outpatient routine, allowing regular diagnostic evaluations and guaranteed humanized and preventive care. In addition, greater knowledge about the mental health of women in menopause can enable proper interventions and promote the maintenance of mental health and quality of life for women. Likewise, it can reduce costs in the health system with hospital emergencies by seeking the primary care network through cases of major depression, anxiety attacks, suicidal ideation, suicide attempts and suicide itself.

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