Original Article

Comparative study of sleep quality and insomnia among women in the climax and with regular menstrual cycle

Estudo comparativo da qualidade do sono e insônia entre mulheres no climatério e com ciclo menstrual regular

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ABSTRACT | INTRODUCTION: Climacteric is the passage between the reproductive and non-reproductive period of women, characterized by hot flushes and sweating that generate changes in their quality of life, which may interfere with sleep and routine activities. **OBJECTIVE:** To evaluate the sleep quality and insomnia level of climacteric women and compare with women of regular menstrual cycle. **METHODS:** Data were collected from January to April 2018. Personal data, date of last menstruation, use of medication, physical activity, alcohol or cigarette use, and anthropometric data were collected. Three questionnaires were applied: the Kupperman Menopausal Index (IMK), applied to women who were in the climacteric; Pittsburgh Sleep Quality Index (PSQI-BR) and Insomnia Severity Index. **RESULTS:** The sample consisted of 53 women, 30 with regular menstrual cycle and 23 during climacteric. The average age was 45 ± 9 years, weight 70 ± 7 kg and height 158 ± 4 cm. Regarding the severity of climacteric symptoms, 61% of women had moderate symptoms and had poor sleep quality where only women in the climacteric were evaluated with the presence of sleep disorder and 67% of women in the climacteric had insomnia. mild to moderate. There was a significant difference between sleep quality (p = 0.001) and insomnia severity (p = 0.014) between groups. **CONCLUSIONS:** Climacteric women have worse sleep quality and mild to moderate insomnia compared to women who regularly menstruate.

Keywords: Women. Climacteric. Sleep disorders. Insomnia. Menstrual cycle.

RESUMO | INTRODUÇÃO: Climatério é a passagem entre o período reprodutivo e não reprodutivo da mulher, caracterizado pelos fogachos e sudorese que geram alterações em sua qualidade de vida, podendo interferir no sono e nas atividades rotineiras. **OBJETIVO:** Avaliar a qualidade do sono e nível de insônia de mulheres no climatério e comparar com mulheres de ciclo menstrual regular. **MÉTODO:** A coleta de dados foi realizada de janeiro a abril de 2018. Foram coletados dados pessoais, data da última menstruação, uso de medicações, se pratica atividade física, uso de bebida alcoólica ou cigarro, além de dados antropométricos. Aplicou-se 3 questionários: o Índice Menopausal de Kupperman (IMK), aplicado nas mulheres que estavam no climatério; Índice de Qualidade do Sono de Pittsburgh (PSQI-BR) e o Índice de gravidade da insônia. **RESULTADOS:** A amostra foi constituída por 53 mulheres sendo 30 com ciclo menstrual regular e 23 no período do climatério. A média de idade foi de 45±9 anos, peso de 70±7 kg e altura de 158 ±4 cm. Observou-se que em relação à gravidade da sintomatologia climatérica, 61% das mulheres obtinham sintomas moderados e apresentavam qualidade do sono ruim onde apenas as mulheres no climatério foram avaliadas com presença de distúrbio do sono e 67% das mulheres que estavam no climatério obtinham insônia leve a moderada. Houve diferença significativa entre a qualidade do sono (p=0,001) e a gravidade da insônia (p=0,014) entre os grupos. **CONCLUSÕES:** Mulheres climatéricas possuem pior qualidade do sono e insônia leve a moderada em comparação com mulheres que menstruam regularmente.

PALAVRAS-CHAVE: Mulheres. Climatério. Distúrbios do sono. Insônia. Ciclo menstrual.

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Introduction

According to the World Health Organization, the climacteric is a biological phase of life and not a pathological process, being understood as the passage between the reproductive and non-reproductive period of a woman's life, beginning between 35 and 40 years old. , and can extend to 65 years of age[1].

At that moment, ovarian follicles depletion occurs to all middle-aged women. In intrauterine life, the ovary has between six and eight million primary oocytes which, by a process called atresia, are reduced to two million at birth and 300,000 or 400,000 at menarche. The atresia process continues with each menstrual cycle until total follicular depletion, subsequently leading to a gradual decline in estradiol secretion, resulting in the definitive cessation of menstrual cycles, a phase defined as menopause[2].

Hypoestrogenism can cause uncomfortable symptoms, disturbing the woman's well-being and presents vasomotor, psychological and urogenital symptoms, which manifest as hot flashes, night sweats, vaginal dryness, weakening of the pelvic floor muscles, dyspareunia, insomnia, mood swings anddepression[3].

The earliest symptoms during the climacteric are hot flashes and sweating, affecting 75% to 85% of women and causing changes in their quality of life. Hot flashes, depending on their intensity and frequency, can interfere with sleep and daily activities, causing irritability and depression. It is observed that within the climacteric symptoms sleep epidemiology is neglected[4,5,6]. In addition to the normal changes caused by the senescence process, sleep disorders are common in women. Sleep is an active process, defined as a state of unconsciousness from which the person can be awakened by sensory or other stimuli. It involves several and complex physiological and behavioral mechanisms, in various systems and regions of the central nervous system. In clinical practice, complaints related to sleep are very prevalent. The main ones are: difficulty in initiating sleep; difficulty in maintaining sleep continuity, with multiple awakenings during the night; waking up early; non-restorative sleep; abnormal movements / behavior at night; daytime fatigue or drowsiness; difficulty in concentrating[7,8,9].

Women in menopause, compared to women in other periods of life, have greater latency for sleep and greater adversity to maintain it. The complaint of insomnia is very present at this stage of life[10,2].

In order to nationally implement women's health care in climacterics, the Department of Health launched in 2003 the Climacteric Assistance Standards, providing specific actions and indicators that would extend access and quality of attention in this phase. Climacteric symptomatology causes an increase in the search for health services, demanding knowledge and training from professionals to support this population[1].

Thus, due to the importance of sleep disorders, especially among women's population in the climacteric and its association with the symptoms presented in this phase, this study has as its main objective to evaluate the quality of sleep and the level of insomnia and compare it with women who menstruate regularly. In addition, it is intended to assess the relationship between the presence of other comorbidities and sleep disorders in this population.

Methods

It refers to a comparative and observational study, whose sample consists of 23 women who are in the climacteric and 30 women who have a regular menstrual cycle, selected through "Snowball sampling", also called the snowball method.

The snowball recruitment technique is a form of non-probabilistic sample used in social surveys where the initial participants in a study recruit new participants who then recruit new participants and so on, until the proposed objective is achieved[11].

Women with climacteric symptoms, who did not use hormone replacement, did not use antidepressants, anxiolytics and hormonal contraceptives, without previous hysterectomy and who did not work the night shift, aged between 34 and 50 years were included. For comparison purposes, women with a regular menstrual cycle, who did not use hormone replacement, did not use antidepressants, anxiolytics and hormonal contraceptives, without previous hysterectomy and who did not work at night, aged between 44 and 54 years old were also included.

The study was analyzed and approved by the Human Research Ethics Committee of Piauí State University (CEP UESPI), under Technical Opinion no. 2.374.112 / 2017 (CAAE 78997517.3.0000.5209) following ethical standards, in accordance with Resolution 466/12 of the National Health Council.

First, contact was made with some women, known to the authors, who had the characteristics to be included in the study, then explaining these research procedures. Through the screening and authorization of the volunteers, the research was initiated. At the end of the interview, in addition to receiving support material with clarifications about the climacteric, it was inquired whether the participants were aware of anyone else with similar symptoms.

Data collection was carried out at the location and at the time of preference of the participants, with a choice always being made for a reserved and quiet place, guaranteeing the secrecy and their privacy. Initially, the Personal Data Sheet prepared by the researchers themselves was filled out, where in addition to having collected sociodemographic data; weight, height, and cervical and abdominal circumference of the participants were recorded.

Weight was measured using an Olist portable digital scale, with a 150 kilograms max. load, and height, measured by cervical and abdominal circumference, using an inelastic measuring tape with a 0.5 cm scale. Participants were instructed to wear light clothes and barefoot when taking measurements.

Right after this stage, 3 questionnaires were applied. The Kupperman Menopausal Index (IMK) was intended only for women in the climacteric group. This questionnaire comprises eleven symptoms or complaints from this phase. They are: vasomotor symptoms, insomnia, paresthesia, nervousness, melancholy, vertigo, weakness, arthralgia / myalgia, headache, palpitation and tinnitus. Different scores are attributed to each of them according to their intensity and prevalence. The higher the score, the more intense the symptoms. Total scores are classified as mild (values up to 19), moderate (between 20 and 35) or intense (greater than 35)[12].

The Pittsburgh Sleep Questionnaire (PSQI-BR) and the Insomnia Severity Index (ISI) were assigned to both groups. The PSQI-BR is composed of 19 self-administered questions and 5 questions answered by your roommates, these are used only for clinical information and were not answered by the participants of the present study. The information obtained in this questionnaire assesses the subjective quality of sleep and refers to the sleep quality of the previous month. The 19 questions are subdivided into 7 evaluation components which are: subjective quality of sleep, latency (time needed to start sleep), duration (hours of sleep per night), efficiency (total sleep time divided by time in bed), sleep disorders, use of sleeping medication and dysfunction during the day (difficulty staying awake). Each item receives a score from 0 to 3, at the end of the questionnaire a score higher than 5 indicates poor sleep quality13. The ISI is a brief and simple questionnaire, consisting of seven items with 5 possible alternatives, which 28, as its maximum score, characterizes very severe insomnia. Respondents are instructed to assess the severity of their insomnia in the past two weeks. The cutoffs that classify the severity of insomnia are: absence of insomnia (0-7), sub-threshold insomnia (8-14), moderate insomnia (15-21) and severe insomnia (22-28). The aim of the ISI is to measure the patient's perception of sleep complaints, assessing the symptoms and consequences of insomnia and the degree of concern and stress due to difficulties with sleep[14].

The organization and tabulation of data was done by using the Microsoft Office Excel® program, where descriptive analyses were performed on average, standard deviation and frequency distribution. Using the Statistical Package for the Social Sciences software (SPSS, version 21.0), a statistical analysis of quantitative data was performed, with a significance level of 5%. The Komogorov-Smirnov test was performed, which determined that the data were not parametric and the Spearman's Rank-Order Correlation test was used to correlate them, in addition to the comparative analysis of the data, the Mann-Whitney test was used as well as the Chi-Square Association test.

Results

The sample of this research was constituted by a total of 53 participants, 30 women with regular menstrual cycle and 23 women in the climacteric period. The average age of the participants was 45 ± 9 years, weight 70 ± 7 kg and height 158 × 4 cm, the average age of women with a regular menstrual cycle was 42 ± 6 and those in the climacteric was 50 ± 3 years.

Out of the total of women studied, it was observed that 70% (n = 37) were married and 25% (n = 13) single, in which 15% (n = 8) had no children, 34% (n = 18) one child, 45% (n = 24) two children and 26% (n = 14) had more than two children.

Table 1 shows the anthropometric characteristics of these groups, showing that, despite being in the climacteric phase, these women did not show a higher obesity index than women with regular menstrual cycle, the abdominal circumference of this group is bigger and, according to the classification, at a higher risk.

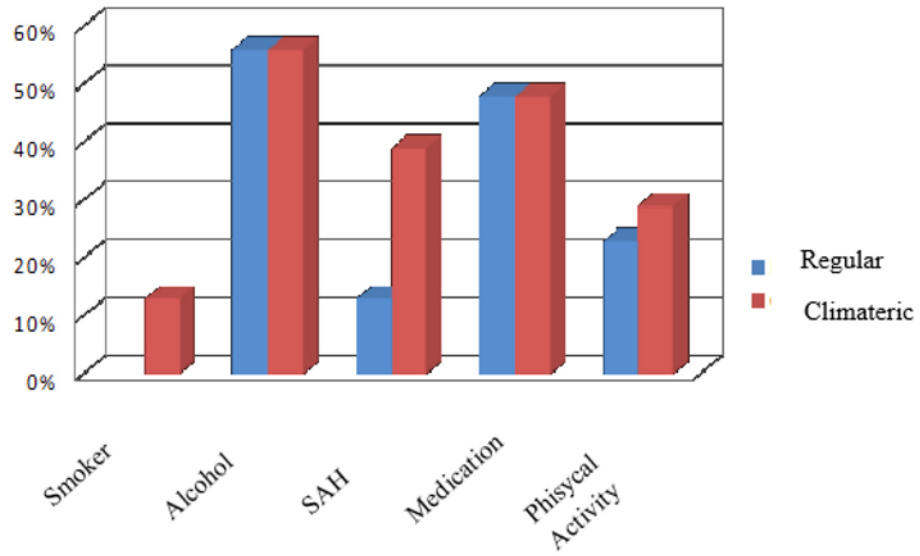
Graph 1 shows some of the participants' sociodemographic variables, where it can be seen that the majority of smokers are in the climacteric phase and that in this group there is also the largest number of women with SAH.

Table 1. Anthropometric characteristics of women with regular menstrual cycle and climacteric phase (n = 53)

Data	Classification	Regular n=30	Climacteric n=23
BMI	Normal	30% (9)	35% (8)
	Overweight	37% (11)	35% (8)
	Obesity	33% (10)	30% (7)
Abdominal Circumference	Ideal	30% (9)	35% (8)
	Increased Risk	23% (7)	17% (4)
	Very Increased Risk	47% (14)	48% (11)

Caption: BMI - Body Mass Index.

Graph 1. Sociodemographic variables of women with regular menstrual cycle and in the climacteric phase (n = 53). Caption: SAH - Systemic Arterial Hypertension



It was observed, according to the Kupperman Menopausal Index, that 61% (n = 14) of women in the climacteric phase had moderate symptoms and 41% (n = 9) mild symptoms related to this phase. It is remarkable that 64% had poor sleep quality (n = 14), and only women in the climacteric were evaluated with the presence of sleep disorder. Furthermore, in relation to the severity of insomnia, it was found that 70% of women on a regular cycle (n = 21) did not have clinically significant insomnia. They had mild to moderate insomnia, as shown in table 2.

Regarding the associations made, it was noted that there was a significant difference between the presence of sleep disorder (p = 0.002) and the absence of significant insomnia (p = 0.02) between the groups studied (Table 02). When comparing the components of the sleep quality questionnaire among these women, a representative value was found regarding latency (p = 0.025), duration (p = 0.008) and sleep efficiency (p = 0.002) according to table 3.

Table 2. Values in percentages and probability of significance in the classification of sleep quality and insomnia severity in women with regular menstrual cycle and in the climacteric phase (n = 53)

Questionnaire	Classification	Regular n=30	Climacteric n=23	p
PSQI-BR	Good Quality	33% (10)	9% (2)	0,073
	Bad Quality	67% (20)	64% (14)	0,883
	Presence of Sleep Disorder	0% (0)	32% (7)	0,002
Insomnia Severity Index	Absence of Significant Insomnia	70% (21)	36% (8)	0,022
	Mild Insomnia	17% (5)	35% (8)	0,231
	Moderate Insomnia	13% (4)	32% (7)	0,238

Caption: PSQUI-BR - Pittsburgh Sleep Questionnaire. * p <0.05 statistically significant for the Chi-Square test.

In Table 4, analyzing the correlations performed, it was found that there is a moderate and directly proportional relationship between the intensity of the symptoms presented in the climacteric phase and the quality of sleep (p = 0.003). The intensity of these symptoms is also related to the severity of insomnia (p = 0.002). In addition, It can be observed that the quality of sleep is also closely related to arterial hypertension (p = 0.025) in women in menopause, as shown in Table 4.

Table 3. Comparison between the components of the Pittsburgh Sleep Quality Index: comparison between the groups of women with regular menstrual cycle and in the climacteric phase (n = 53)

Comparison of PSQI of the two groups	Subjective Quality	Latency	Duration	Eficiency	Sleep Disorder	Medication	Daytime Disorder
P - value	0,111	0,025*	0,008*	0,002*	0,343	0,045*	0,908

Caption: * p <0.05 statistically significant for Mann-Whitney test.

Table 4. Correlations between intensity of climacteric symptoms, quality of sleep and level of insomnia and hypertension (n = 23)

Variables	Climacteric n=23	
	Correlation (ρ)	P
Kupperman and PSQI	0,598	0,003*
Kupperman and insomnia	0,620	0,002*
PSQI and hypertension	0,466	0,025*
Insomnia and subjective quality	0,073	0,740
PSQI and Medication use	-0,387	0,068
PSQI and Alcohol	0,124	0,574

Caption: PSQUI-BR - Pittsburgh Sleep Quality Index. * p <0.05 statistically significant for Spearman's test.

Discussion

This study points out that women in menopause have poor sleep quality compared to women who menstruate regularly. The results found indicate that the symptoms present in this phase are closely linked to the quality of sleep and the level of insomnia of this population.

The information obtained in this research showed a predominance of women with the presence of sleep disorder, a characteristic found only in the group of women in the climacteric. The loss of sleep quality is a serious health problem and a relevant public health issue, being an important indicator in the variables of quality of life of women in climacteric[15].

Similar data were found in the study by Corrêa et al.[16] where 34 women aged between 50 and 70 and at least 12 months of amenorrhea were included in the study, presenting an index of 68%, in relation to the Pittsburgh Sleep Quality Index (PSQI) in the classification the presence of sleep disorder.

They also corroborate the study by Portela et al.[17] who obtained a sample of 60 participants and evaluated the quality of sleep in active and sedentary climacteric women, where they also presented similar results, in which 30% of the sample presented the presence of sleep disorder.

During the menopausal transition, sleep disorders are common complaints among the female population. Researches highlight that, unlike other climacteric complaints that improve over time, sleep problems seem to intensify in the years following menopause. Knowing that hormonal changes can bring discomfort to women, decreasing their productive capacity, causing dysfunctions in their sleep-wake rhythm, predisposing them to fatigue and irritability and exposing them to responses of wide emotional lability[1,6,18].

It is observed in the presented study that there was no significant result in relation to the level of insomnia in the population studied, however there are findings in the literature on the prevalence of insomnia in this population group. Studies show that 50 to 75% of women complain of insomnia, mainly to initiate sleep, frequent awakening at night and daytime sleepiness during menopause and postmenopause. Some authors understand that sleep disorders in this period result from a moderately hyperadrenergic state, regardless of vasomotor symptoms. On the other hand, most authors understand sleep disorders and the consequent fatigue the next day as secondary to vasomotor symptoms[19].

In the research carried out by Campos et al.[20], where sleep quality was analyzed in women between 50 and 65 years old, it was noted that the prevalence of subjective insomnia was 61%, while that of objective insomnia assessed by polysomnography was 83%.

The previously mentioned study by Corrêa et al.[16], which evaluated women using the Insomnia Severity Index (ISI) questionnaire, 12% had sub-threshold, severe insomnia. Neuropsychic symptoms often affect women in this period, such as irritability, anxiety, nervousness, depression, fatigue, lack of concentration and memory, which can be intensified in women who are affected by insomnia[21].

In our study, it was possible to perceive the significant correlation between insomnia and sleep quality with the Kupperman's Menopausal Index. Depending on its intensity and frequency, symptoms in the climacteric, especially hot flashes, can interfere with sleep and daily activities, and possibly cause irritability and depression. Hot flashes have a negative influence on quality of life, because when they occur at night, they cause changes in sleep. However, there is no consensus in this regarded[22].

Blümel et al.[23] found that the vasomotor symptoms characteristic of the most intense climacteric phase and psychological symptoms such as anxiety and depression were related to sleep disorders. It is assumed that vasomotor symptoms are associated with depression because they cause repeated awakenings, with sleep fragmentation harming well-being during the day.

Sleep complaints are very much related to symptoms of anxiety, headaches, dizziness, palpitations, depression and weight gain[24], noting that it is not possible to disassociate the link of this set of symptoms classified through the Kupperman' Menopausal Index with the presence of sleep disorders.

It was noted that other aspects are related to the quality of sleep, such as high blood pressure and medication use. A similar result to Fernandes et al.[25] where it was demonstrated that around 80% of women have arterial hypertension during menopause, which may be related to weight gain, reduced physical activity and lack of hormonal protection to the cardiovascular system.

Inactivity in climacteric women can help the onset or worsening of certain diseases such as arterial hypertension and coronary artery disease, among others[23]. Another factor found in these women that can alter the synchrony of the sleep-wake cycle are chronic diseases that need to be treated by using drugs that are known to be sleep disturbing substances, such as antihypertensive drugs (β-blockers, thiazides, calcium channel blockers)[26].

Despite not being observed in our study, the researched literature shows the dominance of overweight and obesity in climacteric women3. This weight gain also deserves attention because of the consequences on cardiovascular risk and the origin of breast, endometrial and colon cancer. During the climacteric, the weight increases by 0.8 kg per year and after menopause, there may be a 20% increase in body fat. Estrogen deficiency contributes to the accumulation of abdominal fat, increasing female cardiovascular risk[16].

Pereira and Lima[27] and Gravena et al.[3] add that due to the reduction of energy expenditure at work and in the performance of domestic chores, the prevalence of overweight and obesity in the climacteric population is high.

It is clear that each woman experiences this phase differently. Many women, before reaching menopause, the public focus of our research, have symptoms that vary in intensity, with less or greater impact on their ways of living, working and on their social relationships, while others show only changes in the menstrual cycle period, showing no other symptoms.

Due to the variety of inclusion criteria, it was difficult to select women with the proposed profile in the climacteric group. The climacteric consists of the set of changes that mark this transition period, where for women it is difficult to identify whether it is in the pre menopause or already in menopause. It was clear that in the sample studied, changes in the body happen and the vast majority of women do not know how to deal with this event. Thus, the scarcity of the sample became an important limitation of the study.

Another limitation to consider is that the existing research in the literature focuses on women in menopause and postmenopause, with little data on individuals who are specifically in the transition between the reproductive and non-reproductive periods. It is important to have knowledge from more research that uses participants in this stage of life as a sample, and then lead health professionals who serve this clientele to be more effective in their treatment.

In fact, All women who experience the climacteric deserve multi-professional, humanized and quality care, guided by respect for rights and needs with an emphasis on health promotion, disease prevention and improving the quality of life.

Conclusion

It is concluded that climacteric women have a worse quality of sleep compared to women who menstruate regularly, that is, who are in the reproductive period. The symptoms presented in this phase, as well as arterial hypertension, are linked to the sleep disturbs observed. The results point to the need for greater attention to sleep disorders and their repercussions in women during the climacteric period.

Author contributions

Silva CS participated in the conception, design, search and statistical analysis of the research data, interpretation of the results and writing of the scientific article, Oliveira BC participated in the statistical analysis of the research data, interpretation of the results and writing of the scientific article. Souza SMO participated in the writing of the scientific article and literature search. Silva HGN participated in the interpretation of the results and writing of the scientific article and Ykeda DS participated in the conception, design, search and statistical analysis of the research data.

Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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