REVISTA BRASILEIRA DE MEDICINA DE FAMÍLIA E COMUNIDADE
RBMFC

www.rbmfc.org.br
ISSN 2179-7994

Research Article

Prevalence and factors associated with sleep disorders in adult women in a municipality in Chapada Diamantina, State of Bahia, Brazil

Prevalência e fatores associados a problemas do sono em mulheres adultas de um município da Chapada Diamantina, Bahia

Prevalencia y factores asociados a problemas de sueño en mujeres adultas del municipio de Chapada Diamantina, Bahía

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Abstract

Introduction: Sleep is an essential biological phenomenon responsible for memory consolidation, thermoregulation, and vital revitalization. However, it can be affected by factors such as the circadian cycle as well as hormonal and neural factors. Women are particularly more vulnerable to sleep disorders due to hormonal fluctuations, which impact sleep quality and increase the predisposition to developing psychological disorders, such as depression and anxiety, as well as chronic diseases. **Objective:** To estimate the prevalence and investigate the factors associated with sleep disorders in adult women registered with the Family Health Strategy in the municipality of Mucugê, state of Bahia, Brazil. **Methods:** This is a cross-sectional, analytical study with a sample consisting of adult individuals registered with the Family Health Strategy of Mucugê. Data collection took place during home visits between November 2021 and March 2022. A questionnaire was applied with sociodemographic questions, lifestyle habits, and sleep quality assessment using the Mini Sleep Questionnaire (MSQ). In addition, blood pressure (two measurements with a 5-minute interval), capillary blood glucose, weight, and waist circumference were measured. **Results:** The sample consisted of 216 women, of whom 171 (79.2%) self-reported to be Black (Black or mixed-race), with a mean age of 46 years. The prevalence of sleep disorders was 53.2% (115), with 17.4% (20) classified as mild, 13% (15) as moderate, and 69.6% (80) as severe. We verified a statistically significant association between Body Mass Index (BMI≥25 kg/m^2; prevalence ratio [PR]=1.55; 95% confidence interval [95%CI] 1.13–2.11) and psychological distress (PR=2.15; 95%CI 1.67–2.76) and the occurrence of sleep disorders among women in Mucugê. **Conclusions:** In this study, we observed a high prevalence of sleep disorders associated with increased waist circumference, overweight and obesity (altered BMI), and psychological distress among adult women living in Mucugê and registered with the municipality's Family Health Strategy.

Keywords: Sleep deprivation; Epidemiology; Women; National health strategies.

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Hilari Lopes Alves
E-mail: hilarialves@outlook.com
Funding:
Bahia Research Foundation (FAPESB), Agreement SUS0018/2021.
Ethical approval:
Ethical approval: 3.758.267 / CAEE: 15618119.7.0000.0053
Informed Consent Form:
yes.
Provenance:
not commissioned.
Associate Editor:
Francisco Eduardo da Fonseca Delgado
Peer review:
external.
Received: 09/16/2024.
Approved: 08/04/2025.

How to cite: Lopes HA, Rodrigues EP, Nascimento Sobrinho CL, Tokumoto IC, Silva RR, Bobô ERA, Pereira JL. Prevalence and factors associated with sleep disorders in adult women in a municipality in Chapada Diamantina, State of Bahia, Brazil. Rev Bras Med Fam Comunidade. 2025;20(47):4509. https://doi.org/10.5712/rbmfc20(47)4509

Resumo

Introdução: O sono é um fenômeno biológico essencial e responsável pela consolidação da memória, termorregulação e revitalização vital, no entanto pode ser afetado por fatores como o ciclo circadiano, bem como fatores hormonais e neurais. As mulheres são particularmente mais vulneráveis a problemas de sono por causa das oscilações hormonais, que impactam a qualidade do sono e aumentam a predisposição ao desenvolvimento de problemas psicológicos, como depressão e ansiedade, além de doenças crônicas. **Objetivos:** Estimar a prevalência e investigar os fatores associados a problemas de sono em mulheres adultas cadastradas na Estratégia de Saúde da Família em Mucugê, Bahia. **Métodos:** Este é um estudo de corte transversal, analítico e amostral constituído de indivíduos adultos cadastrados na Estratégia de Saúde da Família de Mucugê. A coleta de dados ocorreu durante visitas domiciliares entre novembro de 2021 e março de 2022. Foi aplicado um questionário com perguntas sociodemográficas, hábitos de vida e qualidade do sono, utilizando o Mini-Sleep Questionnaire. Além disso, foram aferidos a pressão arterial (duas medições com intervalo de 5 minutos), a glicemia capilar, o peso e a circunferência abdominal. **Resultados:** A amostra foi composta de 216 mulheres, das quais 171 (79,2%) se identificaram como negras (pretas ou pardas), com média de idade de 46 anos. A prevalência de problemas do sono foi de 53,2% (115), sendo 17,4% (20) classificados como leves, 13% (15) como moderados e 69,6% (80) como graves. Encontrou-se associação estatisticamente significante entre o índice de massa corporal (IMC≥25 kg/m2; razão de prevalência — RP=1,55; intervalo de confiança de 95% — IC95% 1,13–2,11) e sofrimento mental (DPM) (RP=2,15; IC95% 1,67–2,76) e a ocorrência de problemas do sono nas mulheres de Mucugê. **Conclusões:** Este estudo observou alta prevalência de problemas do sono associados a circunferência abdominal elevada, sobrepeso e obesidade (IMC alterado) e presença de DPM em mulheres adultas residentes em Mucugê e cadastradas na Estratégia de Saúde da Família desse município.

Palavras-chave: Privação do sono; Epidemiologia; Mulheres; Estratégias de saúde nacionais.

Resumen

Introducción: El sueño es un fenómeno biológico esencial, responsable de la consolidación de la memoria, la termorregulación y la revitalización vital. Sin embargo, puede verse afectado por factores como el ciclo circadiano, así como por factores hormonales y neuronales. Las mujeres son particularmente más vulnerables a los problemas del sueño debido a las fluctuaciones hormonales, que impactan la calidad del sueño y aumentan la predisposición a desarrollar trastornos psicológicos como la depresión y la ansiedad, además de enfermedades crónicas. **Objetivos:** Estimar la prevalencia e investigar los factores asociados a los problemas del sueño en mujeres adultas registradas en la Estrategia de Salud de la Familia en Mucugê, Bahía. **Métodos:** Se trata de un estudio transversal y analítico con una muestra constituida por individuos adultos registrados en la Estrategia de Salud de la Familia de Mucugê. La recolección de datos se realizó durante visitas domiciliarias entre noviembre de 2021 y marzo de 2022. Se aplicó un cuestionario con preguntas sociodemográficas, hábitos de vida y evaluación de la calidad del sueño, utilizando el Mini-Sleep Questionnaire (MSQ). Además, se midieron la presión arterial (dos mediciones con un intervalo de 5 minutos), la glucemia capilar, el peso y la circunferencia abdominal. **Resultados:** La muestra estuvo compuesta por 216 mujeres, de las cuales 171 (79,2%) se identificaron como negras (negras o mestizas), con una edad media de 46 años. La prevalencia de problemas del sueño fue del 53,2% (115), siendo el 17,4% (20) clasificados como leves, el 13,0% (15) como moderados y el 69,6% (80) como graves. Se encontró una asociación estadísticamente significativa entre el Índice de Masa Corporal (IMC≥25 kg/m²; RP=1,55; IC95% 1,13–2,11) y el Sufrimiento Psicológico (RP=2,15; IC95% 1,67–2,76) con la ocurrencia de problemas del sueño en mujeres de Mucugê. **Conclusiones:** Este estudio observó una alta prevalencia de problemas del sueño asociados a un perímetro abdominal elevado, sobrepeso y obesidad (IMC alterado) y la presencia de sufrimiento psicológico en mujeres adultas residentes y registradas en la Estrategia de Salud de la Familia (ESF) del municipio de Mucugê, Bahía.

Palabras clave: Privación de sueño; Epidemiología; Mujeres; Estrategias de salud nacionales.

INTRODUCTION

Sleep is a vital biological phenomenon whose regulation is influenced by the circadian cycle, in addition to hormonal and neural factors. Its importance is highlighted in memory consolidation, thermoregulation, and revitalization of vital energy as well as in the restoration of brain energy metabolism.[1]

The sleep-wake cycle presents variations throughout human life. In the first years, children sleep up to 16 hours a day, without distinction between sex. However, during puberty, especially after menarche in women, there are differences in sleep quality, attributed to hormonal fluctuations in estrogen and progesterone.[2] During pregnancy, anatomical and hormonal changes also negatively affect the quality of sleep. In the fifth decade of life, during perimenopause and postmenopause, women experience early sleep complaints in relation to men, due to the decrease in the production of gonadal hormones (estrogen

and progesterone, which are protectors of insomnia), resulting in sleep fragmentation, short stages of restorative sleep, and consequently poor sleep quality.[2]

Taking this into consideration, women are more susceptible to sleep disorders due to physiological differences such as their slightly-shorter circadian cycle and hormonal fluctuations throughout life. In addition, external factors — such as stress, work overload, family responsibilities, unemployment, lack of leisure, and chronic diseases — play a significant role in the development of sleep deprivation.[3] Sleep deprivation increases the amount of stress, anxiety, fatigue and, consequently, depression.[4-7]

Zhang and Wing,[8] in a meta-analysis comprising 29 studies with the participation of both sexes, highlighted disparities in the prevalence of sleep disorders, which are 1.41 times more common among women compared to men. Women also presented substantially higher rates of insomnia (29.5% versus 15%), fatigue (76% versus 58.1%), morning headache (63.8% versus 30.3%), and depression (35.7% versus 12.1%).[9]

Authors of a study conducted in the urban population of Germany[10] showed that women, especially those with low socioeconomic status, are most affected by sleep disorders such as insomnia. Moreover, people living in urban areas with a medium or high socioeconomic level are more likely to enjoy a good quality of sleep compared to those with lower socioeconomic status. Factors, such as anxiety, depression, obesity. and chronic diseases, also directly influence sleep quality.[10] In addition, authors of a survey conducted in 132 Brazilian cities demonstrated that 76% of individuals aged 16 years or older had at least one sleep disorder, being more prevalent in women.[6]

Considering the significant impacts on quality of life and the high risk of developing sleep disorders in women, in the present study we aimed to investigate the factors associated with sleep disorders in adult women registered with the Family Health Strategy in the city of Mucugê, state of Bahia, Brazil.

METHODS

Study design

This is a cross-sectional, analytical, and sampling study conducted in the municipality of Mucugê. This type of study is characterized by low cost, speed, and objectivity in data collection, in addition to describing the characteristics of events in a population with the objective of identifying cases or detecting risk groups.[10]

Scenario: location and period

Mucugê is located 338 km from the municipality of Feira de Santana and has 12,137 inhabitants. In terms of health facilities, the municipality has five family health units (FHU), distributed in its urban and rural areas.[11]

Data were collected by six medical students from Universidade Estadual de Feira de Santana through home visits, from November 2021 to March 2022.

The students received specific training for the application of the instrument. The training consisted of a 12-hour course. During the data collection stage, the students were accompanied by community health

agents responsible for the selected microareas. In addition, a researcher from the study coordinating team supervised the entire process, ensuring the quality and compliance of the adopted procedures.

Participants

Individuals aged 18 years or over, registered with the Mucugê Family Health Strategy, who accepted to participate in the study after reading and signing the Informed Consent Form were included. If the participant was unable to read or write, the Informed Consent Form was read in the presence of a trusted person or, in their absence, of a community health agent.

The exclusion criteria were: change of address of the individual drawn to participate in the research, death of the drawn individual, and disagreeing with the application of the questionnaire. In all these cases, the participant was replaced by the neighboring unit to avoid sample losses.

Variables

The variables analyzed in the present study were:

- Sociodemographic: age, in years (≥48 and <48); marital status [no partner (single, widowed, and separated); has a partner (married and common-law marriage)]; level of education [poor education (middle school; some elementary school; illiterate); good education (some high school, high school, higher education)]; race/skin color [self-reported (Black/mixed-race) and others (white, Asian, or Indigenous)]; hometown (Mucugê; other cities in Bahia); monthly family income [low (≤one minimum wage) and high (>one minimum wage)]; children (yes; no); and paid work (yes/no);
- Health problems; self-reported diabetes and hypertension (yes/no); psychological distress/minor psychiatric disorders (present/absent);
- Lifestyle habits; smoking (yes/no); drinking (yes/no).
- Anthropometric: waist circumference (WC) (defined for women as altered ≥80 cm and healthy <80 cm).[12] The body mass index (BMI=weight kg/height m^2) was calculated by measuring weight and height. Individuals with BMI≥25 kg/m^2 were classified as overweight/obesity, and individuals with BMI<25 kg/m^2, eutrophic.[13]

Data sources

The Mini Sleep Questionnaire (MSQ) was used to evaluate the quality of sleep. This instrument consists of ten items, was translated and validated to Brazilian Portuguese, and evaluates the subjective quality of sleep, being useful for screening sleep disorders in populations.[9,14]

Answers are given on a seven-point Likert scale, ranging from one (never) to seven (always). Thus, the score ranges from 10 to 70 points, and the higher the score, the more sleep disorders. From 10 to 24 points, good sleep quality; 25 to 27 points, mild sleep difficulties; 28 to 30 points, moderate sleep difficulties; and ≥31 points, severe sleep difficulties. The total score provides an estimate of the quality of sleep and the presence or absence of sleep disorders. In this study, individuals who had a score greater than or equal to 25 points (MSQ result≥25 points) were considered to have sleep disorders.[9]

Sample size

The study sample consisted of 337 adult individuals aged 18 years or over registered with the Family Health Strategy. To calculate the sample size, a 25% prevalence of sleep disorders was used as reference.

Initially, the estimated sample size was 285 individuals. However, considering that the population is comprised of several FHUs, a correction factor (design effect — DEFF) of 1.2 was applied to adjust the sample size. With this correction, the estimated final sample size was 342 individuals. In the present study, only women's data were used.

The selection of the research participants was carried out by stratified and systematic random sampling, after obtaining the registration of the FHUs, guaranteeing the same population representativeness of the FHUs in the drawn sample. Thus, the sample was obtained in three stages. The first stage was the draw of the microareas of each FHU; the second, the draw of the families; and finally, the third stage was the draw of the individuals. The selected individuals were contacted through home visits by the community health agent of the microarea and were informed about the objectives and procedures of the research.

Management of losses

The loss rate was 1.5%, due to the fact that the events occurred in rural areas, where there were no neighboring residences available for the replacement of the participants.

Statistical methods

Two databases were created to compare the pieces of information and identify possible typing errors, using the EPIDATA program and the Statistical Package for the Social Sciences (SPSS) software. Statistical data analysis was performed using the SPSS software for Windows 9.0. The relative and absolute frequencies of the qualitative variables were calculated as well as the mean and standard deviation of the quantitative variables.

First, a descriptive analysis was performed, obtaining absolute and relative frequencies, mean values, and standard deviation. An association analysis was performed between sociodemographic variables, lifestyle habits, health problems (systemic arterial hypertension, diabetes mellitus, psychological distress), anthropometric changes (BMI and WC) (independent variables), and the MSQ result. The prevalence ratio (PR) and its 95% confidence interval (95%CI) were used to measure the association and statistical inference of the results.

Ethical aspects

The research project was submitted for consideration and approval by the Research Ethics Committee of Universidade Estadual de Feira de Santana (Certificate of Presentation for Ethical Consideration: 15618119.7.0000.0053), following the recommendations of Resolution No. 466/2012.[15] It was approved and funded by the Bahia Research Foundation, Agreement SUS0018/2021.

RESULTS

The study sample consisted of 216 women. Of these, 171 (79.2%) self-reported to be Black (Black or mixed-race), while 45 (20.8%) self-reported to be white. The mean age was 46 years, ranging from 18 to 94 years. Among these women, 90 (41.7%) were identified as suspected of having hypertension, while 126 (58.3%) were considered normotensive. We observed that 70 (32.4%) women did not reduce salt intake in their meals, while 146 (67.6%) reported they had reduced salt intake. As for blood glucose, 35 women (16.2%) presented postprandial blood glucose levels above 141 mg/dL, deemed altered. In Table 1, we present the sociodemographic data.

Table 1. Sociodemographic characteristics of a sample of adult women registered with the Family Health Strategy, Mucugê, state of Bahia, 2022.

Variables	n*	%
Marital status	**216**	**100**
Has a partner	113	52.3
No partner	103	47.7
Level of education	**216**	**100**
Illiterate	42	19.5
Elementary School	64	29.6
Middle School	27	12.5
High School	69	32
Higher Education	14	6.5
Children	**216**	**100**
No	36	16.7
Yes	180	83.3
Income**	**216**	**100**
No income	5	2.4
Up to one minimum wage	88	40.7
From one to two minimum wages	75	34.7
Over two minimum wages	48	22.2

*Valid results, disregarding ignored ones; **Minimum wage in 2022=BRL 1,100.

Regarding the practice of physical activity, 116 women reported not exercising, while 100 reported exercising to some extent. Regarding BMI, 142 women (65.7%) were classified as overweight/obesity and 74 (34.3%), eutrophic. In addition, 189 (87.5%) women had waist circumference equal to or greater than 80 cm, while 27 (12.5%) had waist circumference less than 80 cm. Regarding eating habits, 109 women mentioned not following specific diets, while 107 reported eating meals with more vegetables, fruits and greens. In Table 2, we present data on lifestyle habits.

Regarding sleep disorders, 115 women (53.2%) were diagnosed with some type of sleep disorder according to the MSQ. Of these, 20 (17.4%) were classified as mild disorders; 15 (13%), moderate disorders; and 80 (69.6%), severe disorders. In Table 3, we show Information on sleep disorders according to the age group of the study population.

As for sleep pattern, 69 women (31.9%) reported having difficulty falling asleep a few times in the last four weeks, while 49 women (22.7%) reported frequently having difficulty falling asleep. In addition,

53 women (24.6%) mentioned waking up in the middle of the night and not being able to sleep anymore. Among them, 31 women (14.3%) reported they have been using or have already used some medication to sleep.

Table 2. Clinical characteristics of a sample of adult women registered with the Family Health Strategy, Mucugê, state of Bahia, 2022.

Lifestyle habits	n*	%
Smoking	**216**	**100**
Has never smoked	177	81.9
Smoker	12	5.6
Former smoker	27	12.5
Use of alcohol	**216**	**100**
No	162	75
Yes	54	25
Social activities/leisure	**216**	**100**
No	71	32.9
Yes	145	67.1

*Valid results, disregarding ignored ones.

Table 3. Relation between sleep disorders and different life cycles of adult women registered with the Family Health Strategy, Mucugê, state of Bahia, 2022.

	Negative	Positive	Total
Young people (up to 19 years)	4	3	7
Adults (20–59 years)	75	83	158
Older adults (over 60 years)	22	29	51
Total	101	115	216

Negative: less than 28 points in the Mini Sleep Questionnaire (MSQ); positive: 28 points or more in the MSQ.

When comparing sleep disorders with socioeconomic characteristics, we noticed a greater association of sleep changes in women with high BMI, waist circumference greater than 80 cm, and a history of minor psychiatric disorders. These data are shown in Table 4.

We verified three associated factors, although not statistically significant: having children (PR=1.44), Black skin color (PR=1.25), and increased waist circumference (PR=1.36). There were two associated factors with statistical significance, namely: high BMI (PR=1.55) and presence of psychological distress (PR=2.15).

DISCUSSION

The high prevalence of sleep disorders (53.2%) verified in the study sample in the municipality of Mucugê may reflect the hormonal fluctuations throughout women's life. Authors of several scientific studies[2,16-18] report that the female hormones — progesterone and estrogen —, when present in large quantities, act as protectors against insomnia, activating brain receptors that improve sleep quality; however, hormonal fluctuations that occur during the menstrual cycle, pregnancy, and menopause affect the quality of sleep in women from puberty to the end of life.

Table 4. Prevalence, prevalence ratio, and 95% confidence interval of the association between sociodemographic characteristics, lifestyle habits, anthropometric measurements, and health conditions in adult women registered with the Family Health Strategy, Mucugê, state of Bahia, 2022.

Variables	Suspected sleep disorder							
	Yes		No		PR	95%CI		p-value
	n	%	n	%				
Marital status								
No partner	52	50.4	51	49.6	0.91	0.70	1.16	0.2214
Has a partner	63	55.7	50	44.3				
Level of education (years)								
≤8	57	53.8	49	46.2	1.02	0.79	1.31	0.4394
>8	58	52.7	52	47.3				
Paid work								
Yes	58	59.2	40	40.8	0.90	0.70	1.16	0.05684
No	57	48.3	61	51.7				
Leisure activity								
Yes	73	50.4	72	49.6	0.85	0.66	1.09	0.1137
No	42	59.1	29	40.9				
Children								
Yes	101	56.1	79	43.9	1.44	0.94	2.21	0.02491
No	14	38.8	22	61.2				
Skin color								
Black	95	55.5	76	44.5	1.25	0.88	1.78	0.09504
Non-Black	20	44.5	25	55.5				
Smoking habit								
Smoker	7	58.3	5	41.7	1.10	0.67	1.80	0.3662
Former smoker and has never smoked	108	52.9	96	41.1				
Drinking habit								
Yes	28	51.8	26	48.2	0.96	0.72	1.30	0.000001537
No	87	53.7	75	46.3				
BMI								
Overweight/obesity	86	60.5	56	39.5	1.55	1.13	2.11	0.001523
Eutrophic	29	39.1	45	60.9				
Waste circumference (cm)								
≥80	102	55.4	82	44.6	1.36	0.88	2.11	0.06403
<80	13	40.6	19	59.4				
Systemic arterial hypertension								
Hypertensive	52	57.8	38	42.2	1.16	0.90	1.48	0.1316
Normotensive	63	50.0	63	50.0				
Blood glucose								
Yes (from 141 onwards)	98	48.5	18	51.5	0.89	0.62	1.29	0.0000001
No (up to 140)	17	54.2	83	45.8				
Psychological distress								
Yes	67	78.9	18	21.1	2.15	1.67	2.76	0.0000001
No	48	36.6	83	63.4				

PR: Prevalence ratio; 95%CI: 95% confidence interval; BMI: body mass index; *valid results, disregarding ignored ones.

Among older adult women participants of the study, aged over 60 years, 56.8% had sleep disorders. This result is widely documented in the literature and is aligned with several studies[2,19-21] on the impact of menopause on quality of restorative sleep during this phase. Gonadotropin deficiency, characterized by decreased function of the ovaries and, consequently, female hormones, triggers symptoms — such as hot flashes, nocturia, insomnia, and mood swings —, significantly contributing to sleep disorders in this period. In addition, authors of a recent study[22] showed that many older women live alone, which can intensify feelings of loneliness, anxiety, sleeping disorders and, therefore, make them more susceptible to depression.

Moreover, it was found that 52.5% of adult women (20–59 years) were diagnosed with sleep changes possibly associated with sociocultural issues. Many researchers[2,23] corroborate these findings, because they highlight that sociocultural factors, such as the burden of family responsibilities, a common reality for many women who face triple journeys every day, are among the main contributors. Additionally, the authors[2] demonstrate that concerns — such as unemployment and anxiety — exert an adverse influence on the quality of sleep of this population.

In this study, we verified that individuals with higher BMI and waist circumference greater than 80 cm showed a significantly stronger association with sleep difficulties. Authors of another study,[24] who investigated the connection between abdominal fat and sleep disorders, pointed out that there is a direct association: the higher the abdominal fat, the greater the problems related to sleep such as snoring and apnea.

A strong and statistically significant association between psychological distress and sleep disorders was also verified in the study sample. This finding is in line with the conclusions of a study[25] whose authors highlight that being a woman, having advanced age, making use of alcohol, dealing with obesity, and facing depression are significant risk factors for problems related to quality and duration of sleep.

The high prevalence of sleep disorders identified in this study reinforces the need for a closer look at the Family Health Strategy on the hormonal, metabolic, and sociocultural determinants that affect the sleep health of women throughout the different stages of their life. The Family Health Strategy can benefit from the findings by systematically incorporating sleep evaluation in routine consultations, especially in the care of women during menopause, with overweight/obesity, or in situations of social vulnerability. Furthermore, teams can develop educational actions and conversation circles that address the impact of multiple journeys, loneliness in old age, mental health and lifestyle habits on sleep, strengthening qualified listening and the relationship with the service users.

The integration between professionals of primary health care, such as physicians, nurses, nutritionists, and psychologists, is also essential to promote multidisciplinary interventions aimed at the prevention and management of sleep disorders, contributing to the well-being and quality of life of women followed up by the Family Health Strategy.

Study limitations

The cross-sectional approach of this study is a limitation. Although it is recognized as an effective method to identify the prevalence of sleep disorders and risk groups, it does not allow to establish a definitive causal relationship, as the analysis of the association between exposure and outcome — in this case, sleep disorders— is performed at a single point in time. In addition, sleep disorders are exclusively evaluated through a self-reported questionnaire, covering only the experiences of the last four weeks.

Another limitation is related to the measurement of the practice of physical activity, as no validated scale was used, being considered only the self-report of the interviewees. Nor was confounding control performed.

Conversely, a distinctive characteristic of this study is the investigation of the prevalence of sleep disorders among women living in a tourist region such as Chapada Diamantina. This area serves as a refuge for many tourists seeking rest away from the busy demand of large urban centers. In turn, data on the quality of life of the local population of Mucugê are scarce, making this research particularly innovative and relevant.

CONCLUSION

In the present study, we observed a high prevalence of sleep disorders associated with high waist circumference, overweight and obesity (altered BMI), and the presence of psychological distress in adult women living in Mucugê and registered with the municipality's Family Health Strategy. We presented valuable data on the several factors that affect the quality of sleep of women living in Mucugê.

The high prevalence of sleep disorders among women can be attributed to a complex interaction of physiological and socioeconomic factors. This understanding is essential for developing effective and adapted interventions, aiming to improve the quality of sleep and, consequently, the health and well-being of these populations. By adopting a holistic and personalized approach, it is possible to promote significant changes that contribute to a better quality of life and mental health in the long term.

CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

HAL: Conceptualization, Data Collection, Formal analysis, Writing – original draft. EPR: Conceptualization, Formal analysis, Writing – review & editing. CLNS: Conceptualization, Formal analysis, Writing – review & editing. ICT: Data Collection, Writing – original draft. RRS: Data Collection, Writing – original draft. ERAB: Data Collection, Writing – original draft. JLP: Conceptualization, Writing – review & editing, Supervision.

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