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Relationship between sleep quality, insomnia and glycemic control in postmenopausal women. A systematic review.

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ADMINISTRATIVE INFORMATION

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Review Stage at time of this submission - Piloting of the study selection process.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 18 June 2026 and was last updated on 18 June 2026.

INTRODUCTION

Review question / Objective Review question: what is the relationship between sleep quality and glycemic control in postmenopausal women?
Objective: The aim of this systematic review is to synthesize current knowledge about the relationship between sleep quality and glycemic control in postmenopausal women. PEO strategy will be used: P: menopausal or postmenopausal women; E: sleep quality (insomnia or sleep quality evaluated with a Pittsburgh questionary); O: glycemic control (fasting glucose or glycosylated hemoglobin levels).

Rationale The postmenopausal stage involves numerous physical, metabolic and psychologic changes, including sleep disturbances (such as impaired sleep quality or the onset of insomnia). These factors not only affect quality of life but can also hinder metabolic processes such as glycemic control, which can be more pronounced in postmenopausal women with diabetes. However, information from clinical studies is scarce and inconclusive. Therefore, given the high prevalence or incidence of diabetes in this stage, it is essential to explore the relationship between sleep quality, insomnia, and diabetes mellitus through a systematic review and meta-analysis.

Condition being studied Menopause is characterized by depletion of estrogen, which cause several changes in women, one of less studied is the difficulty in glycemic control; this could be because the estrogens are involved in insulin secretion and sensitivity. In addition, estrogens influence the brain modifying the quality and quantity of sleep, and this can affect glucose control, some studies in older adults have linked higher levels of glycosylated hemoglobin with poor sleep quality.

METHODS

Search strategy Several terms will be used and adapted as search strategy, according to the consulted database. For PubMed will be: (((menopause) OR (postmenopause)) AND (("sleep quality") OR (insomnia) OR ("indicator of sleep") OR (PSQI)) AND (("glycemic index") OR ("Carbohydrate quality index") OR ("blood glucose") OR ("Fasting glucose")); Web of Science and Scopus: (((menopause) OR (postmenopause)) AND (("sleep quality") OR (insomnia) OR (indicator of sleep)) AND (("glycemic index") OR ("Carbohydrate quality index") OR ("blood glucose") OR ("Fasting glucose") OR (Glycosylated hemoglobin). Spanish databases: LILACS: (menopausia) OR (postmenopausia) AND ("calidad del sueño") OR (insomnio) AND ("índice glucémico") OR ("glucosa en ayunas") OR ("control glucémico") OR ("hemogobina glicosilada"); SciELO: ((menopausia)) AND ("calidad del sueño") OR (Insomnio) AND ("control glucémico") OR ("glucosa en ayunas") OR ("hemoglobina glicosilada")((menopausia)) AND ("calidad del sueño") OR (Insomnio) AND ("control glucémico") OR ("glucosa en ayunas") OR ("hemoglobina glicosilada") and TESIUNAM: (menopausia) OR (postmenopausia) AND ("calidad del sueño") OR (insomnio) AND ("índice glucémico") OR ("glucosa en ayunas") OR ("control glucémico") OR ("hemogobina glicosilada").
In addition to electronic search, reference lists of included studies will be manually reviewed for additional literature.

Participant or population Middle-aged menopausal or postmenopausal women diagnosed with diabetes. When a study includes a mixed population, such as prediabetes and type 2 diabetes, only if the data for the subsample with type 2 diabetes can be clearly identified or if their inclusion does not compromise the clinical and methodological consistency of the review shall be considered.

Intervention Exposition: sleep quality or insomnia.

Study designs to be included Observational studies (such as cohorts, cross-sectional and case-control) examining the relationship between glycemic control and sleep quality.

Eligibility criteria Menopausal/postmenopausal women with diabetes (including measurements of fasting glucose and/ or glycosylated hemoglobin) and sleep quality measured through validated questionnaires or insomnia.

Information sources A systematic search will be performed of scientific data on six databases: PubMed, Web of Science, Scopus, SciELO, LILACS. Also, TESIUNAM as gray literature database.

Main outcome(s) The relationship between glycemic control and sleep quality. The PSQI score and level of fasting glucose or glycosylated hemoglobin will be used, alongside values such as Odds Ratio (OR) or Relative Risk (RR).

Data management For this review, studies will be classified according to PSQI scores and levels of fasting glucose or glycosylated hemoglobin. Additional subgroups will be added, if necessary. Two reviewers will participate in the study selection to decide their inclusion. When there is discrepancy, a third reviewer will intervene.

Quality assessment / Risk of bias analysis For the observational studies Newcastle-Ottawa Scales (NOS) will be used to assess quality.

Strategy of data synthesis A systematic review chart will be elaborated, considering the elements of the achromic PEO. Software RevMan version 5.4.1 will be used to create the possibility to carry out a meta-analysis and a model of random effects to estimate the effect size.

Subgroup analysis Subgroup analysis will be done to identify the causes of variation in the relationship between different glycemic control measures.

Sensitivity analysis Sensitivity analysis will be performed if the combined result has high risk of heterogeneity.

Language restriction Only observational studies published in English, Portuguese and Spanish will be considered.

Country(ies) involved Mexico.

Keywords Glycemic control, menopause, sleep quality, Pittsburgh sleep quality Index, glycosylated hemoglobin, diabetes.

Dissemination plans At the end of the review, it will be published in a peer reviewed journal. Furthermore, results will be presented in a disclosure event.

Contributions of each author
Author 1 - Ana Karen Ruiz-Rodríguez - Review conception, review design, study selection, data

collection, data management, data analysis, data interpretation, writing-protocol and writing-original draft.
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Author 4 - Martha Asunción Sánchez-Rodríguez - The author is the review' coordinator, in addition she has the activities of study selection, data collection, data analysis, data interpretation, and writing-original draft.
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