SLEEP QUALITY IN ADULTS WITH ANKYLOSING SPONDYLITIS: AN INTEGRATIVE REVIEW

QUALIDADE DO SONO DE ADULTOS COM ESPONDILITE ANQUILOSANTE: UMA REVISÃO INTEGRATIVA

CALIDAD DEL SUEÑO EN ADULTOS CON ESPONDILITIS ANQUILOSANTE: UNA REVISIÓN INTEGRATIVA

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ABSTRACT

Introduction: Ankylosing spondylitis is an inflammatory disease that primarily affects the spine and may lead to vertebral fusion. Poor sleep quality, presentin a large portion of the population, negatively affects physical and cognitive functioning, as well as overall well-being. In patients with inflammatory joint diseases such as ankylosing spondylitis, sleep disorders show a strong relationship with chronic pain and clinical worsening. Thus, understanding this interaction is essential for an effective multidisciplinary approach.

Objectives: To analyze recent literature investigating the relationship between sleep quality in adults with different forms of ankylosing spondylitis.

Methodology: This study is an integrative review that examined the relation ship between sleep quality and ankylosings pondylitis. A search was conducted in the PubMed, SciELO, Cochrane and LILACS databases, including studies from 2010 to 2025 involving adults and published in Portuguese, English or Spanish. After selection and careful reading, only articles that directly addressed sleep and ankylosing spondylitis were included. Data were organized in tables and qualitatively analyzed. The main findings were synthesized and discussed to answer the guiding question of the review.

Results: Eleven studies were included, most of them cross-sectional observational designs. The findings revealed a high prevalence of poor sleep quality, sleep-related breathing disorders, insomnia, and daytime sleepiness in patients with ankylosing spondylitis. Factors such as pain, fatigue, depression, stiffness, higher disease activity, worse physical function, age, increased Body Mass Index and metabolic alterations were strongly associated with poorer sleep quality.

Conclusion: The results indicate that sleep quality is significantly related to multiple clinical aspects of ankylosing spondylitis, reinforcing its importance in the multidimensional

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management of the disease. However, there is as carcity of studies on intervention, especially physiotherapeutic ones, aimed at improving sleep in this population, highlighting the need for future research exploring more specific therapeutic and multiprofessional approaches.

Keywords: Sleep. Spondylitis. Ankylosing. Quality of Life. Functioning.

RESUMO
Introdução: A espondilite anquilosante é uma doença inflamatória que acomete principalmente a coluna e pode levar à fusão vertebral. A má qualidade do sono, presente em grande parte da população, impacta negativamente funções físicas, cognitivas e o bem-estar geral. Em pacientes com doenças articulares inflamatórias, como a espondilite anquilosante, os distúrbios do sono mostram forte relação com dor crônica e piora clínica. Assim, compreender essa interação é essencial para uma abordagem multidisciplinar eficaz.

Objetivos: Analisar a literatura recente que tenha investigado a qualidade de sono em adultos com espondilite anquilosante.

Metodologia: Este estudo é uma revisão integrativa que investigou a relação entre qualidade do sono e espondilite anquilosante. A busca foi realizada nas bases PubMed, SciELO, Cochrane e LILACS, incluindo estudos de 2010 a 2025 em adultos, nos idiomas português, inglês e espanhol. Após seleção e leitura criteriosa, foram incluídos apenas artigos que abordavam diretamente sono e espondilite anquilosante.Os dados foram organizados em quadros e analisados qualitativamente.Os principais achados foram discutidos de forma sintética, permitindo responder à pergunta norteadora da revisão.

Resultados: Foram incluídos 11 estudos, sendo a maioria de delineamento observacional transversal. Os achados revelaram elevada prevalência de má qualidade do sono, distúrbios respiratórios relacionados ao sono, insônia e sonolência diurna em pacientes com espondilite anquilosante. Fatores como dor, fadiga, depressão, rigidez, maior atividade da doença, pior função física, idade, Indice de Massa Corpórea aumentado e alterações metabólicas mostraram forte associação com pior qualidade do sono.

Considerações finais: Os resultados indicam que a qualidade do sono está significativamente relacionada a múltiplos aspectos clínicos da espondilite anquilosante, reforçando sua importância no manejo multidimensional da doença. Entretanto, há escassez de estudos sobre intervenções, especialmente fisioterapêuticas, voltadas à melhoria do sono nessa população, evidenciando a necessidade de pesquisas futuras que explorem abordagens terapêuticas e multiprofissionais mais específicas.

Palavras-chave: Sono. Espondilite Anquilosante. Qualidade de Vida. Funcionalidade.

RESUMEN
Introducción: La espondilitis anquilosante es una enfermedad inflamatoria que afecta principalmente a la columna vertebral y puede conducir a la fusión vertebral. La mala calidad del sueño, presente en gran parte de la población, impacta negativamente las funciones físicas, cognitivas y el bienestar general. En pacientes con enfermedades articulares inflamatorias, como la espondilitis anquilosante, los trastornos del sueño muestran una fuerte relación con el dolor crónico y el empeoramiento clínico. Por lo tanto, comprender esta interacción es esencial para un abordaje multidisciplinario eficaz.

Objetivos: Analizar la literatura reciente que haya investigado la calidad del sueño en adultos con espondilitis anquilosante.

Metodología: Este estudio corresponde a una revisión integrativa que investigó la relación entre la calidad del sueño y la espondilitis anquilosante. La búsqueda se realizó en las bases de datos PubMed, SciELO, Cochrane y LILACS, incluyendo estudios publicados entre 2010 y 2025 en adultos, en los idiomas portugués, inglés y español. Tras la selección y lectura rigurosa, se incluyeron únicamente artículos que abordaban directamente el sueño y la espondilitis anquilosante. Los datos se organizaron en cuadros y se analizaron cualitativamente. Los principales hallazgos se discutieron de forma sintética, permitiendo responder a la pregunta orientadora de la revisión.

Resultados: Se incluyeron 11 estudios, siendo la mayoría de diseño observacional transversal. Los hallazgos revelaron una elevada prevalencia de mala calidad del sueño, trastornos respiratorios relacionados con el sueño, insomnio y somnolencia diurna en pacientes con espondilitis anquilosante. Factores como dolor, fatiga, depresión, rigidez, mayor actividad de la enfermedad, peor función física, edad, índice de masa corporal elevado y alteraciones metabólicas mostraron una fuerte asociación con una peor calidad del sueño.

Consideraciones finales: Los resultados indican que la calidad del sueño está significativamente relacionada con múltiples aspectos clínicos de la espondilitis anquilosante, reforzando su importancia en el manejo multidimensional de la enfermedad. Sin embargo, existe una escasez de estudios sobre intervenciones, especialmente fisioterapéuticas, orientadas a la mejora del sueño en esta población, lo que evidencia la necesidad de futuras investigaciones que exploren enfoques terapéuticos y multiprofesionales más específicos.

Palabras clave: Sueño. Espondilitis Anquilosante. Calidad de Vida. Funcionalidad.

1 INTRODUCTION

Among rheumatic diseases, ankylosing spondylitis (AS) is a condition that mainly affects the spine and sacroiliac joints. The persistent inflammatory process of this disease promotes fibrosis and ossification, which can culminate in progressive fusion of the spine (TSUKAZAKI; KAITO, 2020).

It is known that sleep and its influence on general health have been increasingly gaining attention from the population, and it is currently estimated that 65% of the Brazilian population suffers from problems of this aspect (DRAGER et al., 2022). Good quality sleep has a multidimensional approach, which in addition to adequate duration, includes depth, repair, daytime nap habits, and other factors. In turn, poor sleep has immediate consequences, such as decreased quality of life, productivity, greater risk of accidents, and also interferes with cognitive function, memory, and learning processes, affecting physical and mental well-being (GUIMARÃES, 2023).

Sleep disorders are closely related to chronic pain processes, especially in patients with inflammatory and mechanical joint diseases (HAMDI et al., 2021). It is assumed that poor sleep quality has a significant correlation with the clinical symptoms of patients with ankylosing spondylitis and, therefore, the education of this population for self-responsibility and regulation of their sleep is indispensable.

Therefore, understanding the relationship between the disease and its repercussions and sleep becomes fundamental for good clinical practice, especially in a multidisciplinary context that seeks comprehensive patient care, considering that health and well-being depend on the integration of physical, emotional, social and functional aspects.

The present study aimed to analyze, through an integrative literature review, the relationships between clinical aspects of patients with ankylosing spondylitis and their sleep conditions. Based on this information, it is expected to consider the sleep approach as a relevant complementary therapeutic strategy, capable of promoting better results in the clinical management of the disease

2 METHODOLOGY

This work is an integrative review of the literature, which allows the synthesis of research results on a delimited theme, in a systematic and organized way, contributing to deepen the knowledge about the relationship between sleep quality and ankylosing spondylitis. The basic question of this study was "Is there a relationship between sleep quality and the clinical aspects of ankylosing spondylitis?".

The search was carried out in the PubMed, SciELO, LILACS, and Cochrane databases, in which studies from the last 15 years (2010 to 2025), in Portuguese, English, and Spanish, carried out in humans over 18 years of age with access to the full text available, were excluded, excluding those who did not have access to the full text or did not meet the other requirements. The descriptors used were "sleep" combined with "ankylosing spondylitis", using the Boolean operator "AND". Studies that did not address sleep and ankylosing spondylitis were excluded.

The analysis of the articles followed some steps, namely the identification of the studies in the databases, reading of the titles and abstracts, complete reading of the eligible articles, and then the inclusion of those that presented relevant contributions to the understanding of the correlation between sleep quality and the symptoms of patients with ankylosing spondylitis.

The data were extracted and organized by means of tables containing the authors and year of publication, title, type of study, sample, age of the sample, study objectives, evaluation methods, results and conclusion of the authors and other data considered pertinent to the present review. Finally, a qualitative and descriptive analysis of the included studies was carried out, whose main findings were discussed in a synthetic way, allowing us to answer the guiding question of this review.

3 RESULTS

In the search in the PubMed database, 25 articles were found, 3 articles in LILACS, 2 in SCIELO and 76 articles in Cochrane, totaling 106 articles. Ninety-five articles were excluded after reading, and 11 were then selected for review (Figure 1).

Figure 1

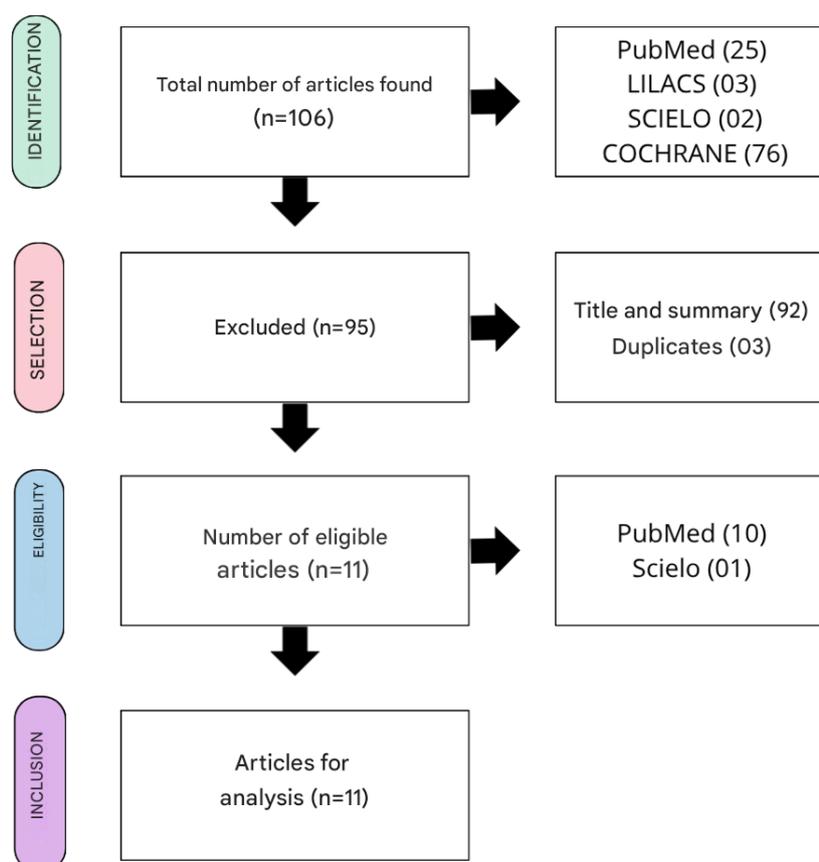*Flow of the search and selection of articles for analysis*

Table 1 presents the characteristics of the included studies, considering methodological and sample aspects. There is a wide variability in the years of publication, ranging from older articles, from 2012, to recent studies, published in 2025. In addition, there is a diversity in the designs adopted, with a predominance of cross-sectional observational studies (n = 6), while the others belong to other types of design. There is also great heterogeneity in the number of participants and the age groups of the samples analyzed.

Table 1

Methodological description of the type of study and the characteristics of the sample of included studies

Authors/year	Type of study	Sample(n)	Age (years)
Li et al. (2012).	Case-control, transverse	314 patients with AS and 102 controls	Average 27.6±8.3 years
Aydin et al. (2015)	Observational, transverse	55 patients with AS and 55 Controls	Average 43 ±10 years (patients) and 42±9 years (controls)
Ljung et al. (2018)	Observational, transverse	346 patients with AS	Average 56 ±15 years
Walsh et al. (2018)	Retrospective cohort observational	6,679 patients with AS and 19,951 controls	Average 50.8±13.6 years (patients) and 51.7±13.4 years (controls)

Wadeley et al. (2018)	Observational, transverse	659 patients, of which 91% with EA	18 to 84 years old
Wang et al. (2020)	Case report	1 sex patient Male	46 years
Chen et al. (2021)	Observational, transverse	104 patients with AS	Average 46 ±12 years
Wiginder et al. (2022)	Observational, transverse	155 patients with AS (63 completed the sleep test); 179 controls	EA:18–70 years old Controls: 50–64 years
Tymms et al. (2022)	Observational, retrospective, non-interventional	495 patients with AS	18 to 95 years old
Salari et al. (2023)	Systematic review	18 studies with a Sample of 5,840 participants	Average age of 27.33± 8.67 to 51.1±14.0 years
Ying et al. (2025)	Observational, transverse	205 patients with AS	179 patients between 18 and 60 years

Legend: Ankylosing Spondylitis (AS).

Tables 2 and 3 present the objectives, evaluation instruments and main results of the studies included in this review. Regarding the objectives, it is observed that the articles investigated several outcomes. Most of them sought to characterize the quality of sleep in individuals with ankylosing spondylitis and to identify factors associated with sleep disorders or poorer sleep quality in this population, while others analyzed the prevalence and/or incidence of sleep disorders.

Two studies addressed the coexistence of comorbidities in the disease, considering sleep disorders as one of them (LJUNG et al., 2018; WALSH et al., 2018). Finally, the case report by Wang et al. (2020) discussed the pathophysiological mechanism of obstructive sleep apnea syndrome in a man with ankylosing spondylitis.

As for the assessment instruments, there is a wide variety of methods used by the studies to measure the different factors related to ankylosing spondylitis and sleep. The clinical aspects of ankylosing spondylitis were evaluated mainly by the BASDAI, ASDAS-CRP/ESR, BASFI, BASMI, BAS-G and ASAS-HI indices. Sleep quality was investigated using PSQI, ESS, ISI, JSEQ, MAPI, polysomnography (PSG) and ApneaLink Air. Symptoms of pain and fatigue were measured with VAS, FACIT-F, and MFI-20. Quality of life was assessed using ASQoL, SF-36 and EQ-5D. Psychological factors were analyzed using the SDS and SAS instruments. In addition, some studies also included evaluation of radiographic factors, using m-SASSS and BASRI, as well as laboratory markers, specifically CRP, ESR, and calcitonin.

Table 2

Methodological description of the objectives and outcomes analyzed in the included studies

Authors/ year	Objectives	Evaluation methods
Li et al. (2012).	To assess the prevalence of sleep disorders in patients with AS and its association with demographic variables, pain, disease activity, functional status, depression, and anxiety	PSQI, EVA, BASDAI, Morning Stiffness, ESR, CRP, BASFI, BASMI and Finger-to-Ground Distance Test, Self-Rating Depression Scale (SDS) and Self-Rating Anxiety Scale (SAS)
Aydin et al.(2015)	To compare sleep quality between AS patients and healthy controls and to assess the relationship between sleep quality and disease activity	PSQI, BASDAI, BASFI
Ljung et al.(2018)	To assess comorbidities associated with AS and to investigate patterns of coexistence between different comorbidities	Electronic medical record data
Walsh et al.(2018)	Compare prevalence and incidence of comorbidities in patients with AS vs. controls	Identification of diagnoses and comorbidities through ICD-9-CM codes in health databases, calculate comorbidity indices and determine incidence rates during the follow-up period
Wadeley et al. (2018)	To analyze sleep in patients with ankylosing spondylitis and non-radiographic axial spondyloarthritis and associations with disease activity, sex, and mood.	Jenkins Sleep Assessment Questionnaire (JSEQ), BASDAI, BASFI, BASMI, Functional Fatigue Scale in Chronic Disease Therapy (FACIT), ASQoL, VAS, presence of extraarticular manifestations, EQ5D, Work Productivity and Activity Impairment Questionnaire
Wanget al.(2020)	To report a case of a patient with AS who developed OSAS and discuss the possible mechanisms involved	Clinical and laboratory examinations; Pulmonary function; Imaging exams; Polysomnography (PSG); Treatment instituted
Chen et al.(2021)	To investigate the association between sleep disturbances, calcitonin, disease activity and severity, functional capacity, mobility, radiographic damage, and health index in patients with AS	Simple sleep quality questionnaires; Laboratory tests; BASDAI,BASFI, BASMI,BAS-G,ASDAS-ESR,ASDAS-CRP; ESR,PCR; Clinical tests (cervical rotation, lumbar flexion, chest expansion); BASRI and m-SASSS;
Wiginder et al. (2022)	To assess the prevalence of OSAS in AS compared to controls, to investigate sleep patterns, and to identify factors associated with OSAS in AS	Home sleep monitoring (ApneaLinkAir®), AHI≥5; ESS Questionnaire; BASDAI, BASFI,BASMI,m-SASSS, thoracic expansion; Laboratory tests
Tymmset al. (2022)	To estimate the prevalence of sleep disorders (insomnia and OSA) in patients with AS in Australian clinical practice and to evaluate the association with disease control and different biological therapies	Insomnia Severity Index (ISI); Multivariate Apnoea Prediction Index (MAPI); FACIT-Fatigue; BASDAI
Salari et al.(2023)	To analyze the prevalence of sleep disorders in patients with ankylosing spondylitis through a systematic review and meta-analysis	Meta-analysis, initiated by a systematic search in the WoS, PubMed, Science Direct, Scopus, Embas, and GoogleScholar, non-period-restricted databases. The identified studies were organized in EndNote. Heterogeneity between studies was analyzed using the I² index and publication bias was analyzed using the Begg and Mazumdar test.
Ying et al. (2025)	To evaluate the prevalence of sleep disorders in patients with ankylosing spondylitis and to analyze the factors that influence their occurrence.	Demographic questionnaire (self-designated); SF-36,EVA, Multidimensional Fatigue Inventory (MFI-20), Self-Rating Anxiety and Depression Scale, PSQI,BASDAI,BASFI, BASMI

Legend: Ankylosing Spondylitis (AS), Erythrocyte Sedimentation Rate (ESR), C-Reactive Protein (CRP), Obstructive Sleep Apnea Syndrome (OSAS), Excessive Time Sleepiness Questionnaire (EQ5D), Modified Stoke Ankylosing Spondylitis Spinal Score (m-SASSS), Bath Disease Activity Index for Ankylosing Spondylitis (BASDAI), Bath Functional Index for Ankylosing Spondylitis (BASFI), Bath Metrology Index for Ankylosing Spondylitis (BASMI).

Table 3

Methodological description of the results found in the included studies.

Authors/ year	Results
Li et al. (2012).	Prevalence of poor sleep (p=0.020); mean PSQI (p=0.020); High risk of sleep disorders (58.6%); Associated factors: age, education, RSS, PRC, global health, pain, morning stiffness, BASDAI, BASFI, depression and anxiety (p<0.001); No association: duration of disease, BASMI and finger-to-side distance. Solo
Aydin et al. (2015)	AE associated with PSQI (p=0.001). Significant differences in the following domains: Subjective sleep quality (p=0.010); Sleep duration (p=0.011); Sleep efficiency Habitual (p=0.034); Sleep disorders (p=0.003); Daytime dysfunction (p=0.009); There was no difference in sleep latency (p=0.181) and medication use (p=0.096). Strong correlation between BASDAI (p<0.001).
Ljung et al. (2018)	OSAS: 8.7% (n=30); strongly associated with male gender (p=0.025), age (p=0.018) and metabolic syndrome (diabetes, dyslipidemia, hypertension).
Walsh et al. (2018)	Patients with AS had a four-fold higher incidence and an increased risk of developing sleep apnea compared with matched controls at all ages (except <45 years of age); increased risk of developing malignancies if they were < 65 years of age, even higher in males.
Wadeley et al. (2018)	Good sleepers were mostly men and performed better in all clinical and quality of life measures, while poor sleepers had higher rates of pain, stiffness, fatigue, worse quality of life, and more impact on work. Anxiety/depression was the leading predictor of poor sleep, increasing the chance of poor sleep quality more than sevenfold, followed by females as the second significant predictor.
Wang et al. (2020)	The patient presented central and mixed dyspnea during sleep, justified by the fusion of the upper cervical vertebrae compressing the respiratory center, as suggested by magnetic resonance imaging findings, and by the enlargement of the right heart and pulmonary hypertension, revealed by echocardiogram. Limitation of thoracic expansion, reduction in oxygen saturation, and prolonged current hypoxia of AS progression contributed to the worsening of apnea episodes and the development of associated OSAHS
Chen et al. (2021)	36.5% of the patients had poor sleep quality, associated with elevated calcitonin (p=0.008), disease duration (p=0.048), CRP (p=0.040) and worse clinical scores (BASDAI, BASFI, BASMI, BAS-G, ASAS-HI; p<0.05). Patients with detectable calcitonin had higher BASRI and m-SASSS. Independent factors: female gender (p=0.013), disease duration (p=0.009), elevated ASDAS-CRP (p<0.001), and detectable calcitonin (p=0.048)
Wiginder et al. (2022)	Prevalence of OSA: AE of 47.8% Controls of 50.8% (p=0.717); 39.7% of AS patients with OSA; 14.3% with OSAS; Factors associated with OSA: older age (p=0.002), higher BMI (p=0.001), lower thoracic expansion (p=0.007)
Tymms et al. (2022)	16% of patients had moderate insomnia, 3.2% severe insomnia, and 31.5% were at risk for sleep apnea. Patients with BASDAI ≥4 had about a risk increased the prevalence of insomnia (p=0.001), and the use of corticosteroids increased the chance of sleep disorders (p=0.045). The IL-17Ai group had a slightly higher risk of apnea than the TNFi group (p=0.046)
Salari et al. (2023)	The pooled overall prevalence of sleep disturbances in patients with AS, based on the random-effects method, was 53% (95% CI: 44.9–61). The highest prevalence was observed in Egypt (90%) and the lowest in Australia (19.2%). The meta-regression results showed that, as the sample size and year of publication increased, the overall prevalence of sleep disorders in patients with AS decreased (p<0.05).
Ying et al. (2025)	Prevalence of sleep disorders: 66.8% of patients with AS; Mean sleep score (PSQI): 8.82± 4.146; Factors associated with worse sleep: Age (p<0.001); Pain level (p < 0.001); Fatigue (p < 0.001); Anxiety and depression (p < 0.001)

Legend: Ankylosing Spondylitis (AS), ErythrocyteSedimentationRate (ESR),C-Reactive Protein (CRP/PCR), Obstructive Sleep Apnea Syndrome (OSAS), Excessive Daytime Sleepiness Questionnaire (EQ5D), Modified Stoke Ankylosing Spondylitis Spinal Score (m-SASSS)

4 DISCUSSION

In the search for articles that investigated the relationship between the clinical condition of patients with ankylosing spondylitis and sleep disorders, most observational cross-sectional studies were found (AYDIN et al., 2015; LJUNG et al., 2018; WEDELEY et al., 2018; CHEN et al., 2021; WIGINDER et al., 2022; YING et al., 2025), in addition to a case-control (LIE et al., 2012), an observational retrospective cohort (WALSH et al., 2018), a non-interventional retrospective study (TYMMS et al., 2022), a case report (WENGET et al., 2020), and a systematic review (SALARI et al., 2023), in which three articles that were

included in the present study were, also, included in the systematic review sample (CHEN et al., 2021; LI et al., 2012; TYMMS et al., 2022).

The studies analyzed demonstrated a strong association between sleep disorders and ankylosing spondylitis, highlighting different correlated factors. Li et al. (2012) observed that sleep disturbances are significantly more common in patients with ankylosing spondylitis than in healthy individuals, with daytime dysfunction, characterized by excessive sleepiness, fatigue, and mood swings being the most prominent component. In agreement, Aydin et al. (2015) found that patients with ankylosing spondylitis have worse sleep quality, especially those with active disease, with a direct correlation between inflammatory activity and the PSQI subscales.

Ljung et al. (2018) identified that multiple comorbidities coexist in patients with ankylosing spondylitis, including obstructive sleep apnea, more prevalent in individuals with metabolic syndrome, diabetes, dyslipidemia, and hypertension. Walsh et al. (2018) complement these findings by reporting approximately four-fold higher rates of sleep apnea, depression, asthma, gastrointestinal ulcers, and venous thromboembolism compared to matched controls.

Wadeley et al. (2018) demonstrated that poor sleep in patients with ankylosing spondylitis is strongly associated with negative mood, female gender, marked fatigue, pain, spinal stiffness, and greater disease activity, these factors being more determinant than the type of treatment. Wang et al. (2020), in

In a case report, they described different pathophysiological mechanisms that explain the sleep apnea-hypopnea syndrome in these patients, such as compression of the respiratory center by the fusion of the cervical vertebrae, pulmonary restrictive changes, nocturnal intermittent hypoxia, and limitation of thoracic expansion.

Chen et al. (2021) found a significant correlation between sleep disturbances and elevated serum calcitonin levels, longer disease duration, female gender, increased inflammatory markers (PCR, BASDAI, ASDAS-ESR, and ASDAS-CRP), and functional limitation assessed by BASMI, especially in cervical rotation and lateral lumbar flexion. Wiginder et al. (2022) observed that, although the prevalence of obstructive sleep apnea in patients with ankylosing spondylitis is not higher than in controls, affected individuals have greater daytime sleepiness, higher BMI, advanced age, and lower thoracic expansion, consequently greater disease severity.

Tymms et al. (2022) also highlight that 19.2% of patients have moderate to severe insomnia and 31.5% are at risk of obstructive sleep apnea, with the impact on sleep being more related to insufficient control of the disease than to the type of biological therapy used

by the patient. Salari et al. (2023) reinforced, through meta-analysis, that the overall prevalence of sleep disorders in patients with ankylosing spondylitis is significantly high, with a strong association with inflammatory activity, pain, and fatigue.

Finally, Ying et al.(2025) confirm that the prevalence of sleep disorders is high in patients with ankylosing spondylitis, with quality of life, pain, fatigue, depression, BASDAI, BASFI, BASMI indices, age, and disease duration being significant negative predictors.

Taken together, this literature shows that sleep disorders are highly prevalent in patients with ankylosing spondylitis and are related to clinical and inflammatory factors as well as to psychological and metabolic aspects, highlighting the importance of a multidimensional approach in the management of these patients.

Although the studies included in this review describe the high prevalence of sleep disorders in individuals with ankylosing spondylitis and the associated factors, there is an important gap in the literature regarding the performance of health professionals in the face of these changes. Most articles emphasize sleep changes and identifying

clinical predictors, but little is addressed about interventions aimed at improving sleep quality in this population.

Interventions with a potential effect were not specifically evaluated in the reviewed studies. Thus, despite the proof and description of the problem, there is still a lack of research on evidence-based therapeutic approaches, highlighting the need for future studies that explore treatment protocols and multidisciplinary strategies aimed at improving sleep quality in these patients.

It is also important to consider the flaws and limitations of the present study, which also reflect the methodological limitations of the articles included in the review. Some studies have had small sample sizes and, consequently, lower statistical power (AYDIN et al., 2015; YING et al., 2025). Retrospective research was also marked by incomplete data, selection bias, lack of formal validation of comorbidities, due to the use of routine clinical records (LJUNG et al., 2018; WALSH et al., 2018; TYMMS et al., 2022). Such limitations include recording inconsistencies, diagnostic coding errors, missing data, and use of convenience samples, restricting the accuracy of the findings.

Another set of limitations refers to the incomplete assessment of relevant clinical variables, such as spinal mobility, chest expansion, psychological status, quality of life, lifestyle habits, and risk factors such as smoking and body mass index (AYDIN et al., 2015; LJUNG et al., 2018; WALSH et al., 2018; YING et al., 2025). In studies with home monitoring, the low rate of completion of the exams is also noteworthy (WIGINDER et al., 2022).

Salari et al. (2023) reported limitations related to the use of non-specific questionnaires, variation in cutoff points, and exclusive dependence on subjective data, which compromises the consistency of prevalence estimates.

Finally, case studies such as the one by Wang et al, (2020), contribute with relevant clinical observations, but have a low capacity for generalization, as they analyze isolated situations.

In addition, the present integrative review has some specific limitations. Most of the articles included have a cross-sectional observational design, which prevents the establishment of causal relationships and limits the understanding of the temporal mechanisms between sleep and disease activity. There was also a wide methodological heterogeneity among the studies, both

in sleep assessment instruments and in the clinical scales used to measure the severity of ankylosing spondylitis, which makes direct comparisons difficult and makes a more robust quantitative analysis, such as meta-analysis, unfeasible. The lack of standardization in the diagnostic criteria and the variability in the profile of the samples evaluated also reduce the generalizability of the findings.

For future research, it is recommended the development of clinical trials with interventions that evaluate the impact of physiotherapeutic, psychosocial and multiprofessional strategies on sleep quality in patients with ankylosing spondylitis.

In clinical practice, it is essential to incorporate systematic sleep assessment, adopt interventions, and promote an interdisciplinary approach that considers physical, psychological, and functional aspects, such as sleep hygiene, regular physical training, pain control, breathing exercises, mobility, and management of psychosocial and metabolic factors. For patients, the importance of self-care and active communication with the health team is reinforced.

Thus, it is concluded that sleep should be considered an essential component in the multidimensional management of ankylosing spondylitis, with the need for greater attention in clinical practice and interdisciplinary care strategies that contemplate the complexity of the disease and its repercussions on general well-being.

5 FINAL CONSIDERATIONS

The integrative review demonstrated that sleep quality is significantly related to several clinical, functional, and psychological aspects of ankylosing spondylitis. The studies analyzed confirm that patients with ankylosing spondylitis have a high prevalence of poor sleep quality, insomnia, daytime sleepiness, and sleep-related breathing disorders, and that these

impairments are associated with greater inflammatory activity, pain, fatigue, stiffness, poorer mobility, and functional impairment. Emotional factors, such as anxiety and depression, as well as metabolic and ventilatory characteristics, were also shown to be important predictors of worse sleep in this population.

Despite the identification of associations, there was a lack of studies investigating specific interventions aimed at improving sleep, especially in the context of physical therapy and other areas of health.

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