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Review on Ashwagandha's Impact on Stress Reduction, Sleep Quality, and Anxiety

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Background

- Ashwagandha (*Withania somnifera*) is a traditional Ayurvedic herb used for thousands of years as an **adaptogen** (a substance that helps the body maintain homeostasis under stress.)[1,2]
- Stress has become increasingly prevalent and is recognized as a significant contributor to **adverse outcomes** such as mental health outcomes, physiological dysfunction, impacting overall quality of life, and long-term health.[3]
- Poor sleep quality affects a substantial proportion of the population, with insomnia emerging as a major public health concern.[4]
- There has been a growing interest in the use of herbal and botanical products as complementary and alternative approaches for the management of stress plus anxiety and sleep-related disorders.
- Active components of Ashwagandha are **withanolides** - withaferin A, withanone, and withanolide D.
- Acts through **GABAergic pathways** to promote sleep and reduce anxiety and HPA axis.[5]

Objective

This study evaluates the impact of regular Ashwagandha use on perceived stress levels, examines its effects on both subjective and objective measures of sleep quality, and determines whether consistent supplementation influences anxiety symptoms.

Methods

- Retrospective literature review
- Articles found through PubMed search
  - MESH Terms: Ashwagandha, stress, sleep, anxiety, and withania somnifera.
  - Analyzed literature that included individuals who used only ashwagandha.
- Studies chosen based on participants that fell within inclusion and exclusion criteria.
- Inclusion criteria: randomized controlled trials, Ashwagandha use only, individuals with insomnia, stress, and/or anxiety.
- Exclusion criteria: use of medications, other herbals, and substances; systematic reviews, severe comorbidities.
- 17 total articles were identified and evaluated based on a broad search using MESH terms on PubMed.
  - Articles were narrowed down to 10 based on the set inclusion and exclusion criteria.
  - 5 articles from the remaining 10 were selected due to having descriptive analysis types and specifically evaluating anxiety, stress, and sleep with scales.
  - Articles were excluded if their outcomes were not measured using validated risk assessment scales, as the absence of standardized metrics limited the ability to ensure consistency, comparability, and methodological rigor across studies.
  - Remaining 5 articles were omitted since they did not assess sleep, stress, and anxiety using established risk scales.

Results

Table 1: Sleep Outcomes

Study	Population	Product / Dose	Sleep Outcome
Langade 2021 RCT	40 control, 40 insomnia + healthy adults	KSM-66: 300 mg BID, 8 weeks	Improved SOL, TST, WASO, SE ($p<0.0001$)
Gopukumar 2021 RCT	130 adults w/ stress (PSS 14-24)	Prolanza: 300 mg daily, 90 days	Significant PSQI improvement ($p<0.0001$)
Pandit 2024 RCT	98 adults w/ chronic stress (PSS > 28)	Sensoril: 125–500 mg daily, 8 weeks	Dose-dependent PSQI improvement by week 8 Week 8 scores: Placebo (10.96±4.41) **WS125** (15.31→7.58±2.97, $p<0.001$) **WS250** (14.08→5.00±2.65, $p<0.001$) **WS500** (18.41→7.45±3.86 $p<0.001$)

Table 2. Stress Outcomes

Study	Population	Extract / Dose	Stress Outcome
Remenapp 2022 RCT	58 adults w/ perceived stress (PSS > 14)	NooGandha: 225–400 mg daily, 30 days	↓ Morning cortisol, ($p<0.01$)
Gopukumar 2021 RCT	130 adults w/ stress (PSS 14-24)	Prolanza: 300 mg daily, 90 days	↓ PSS + ↓ cortisol ($p<0.0001$) PSS: 19.5 (baseline) → 13.0
Baker 2022 RCT	60 stressed college students	ARE: 350 mg BID, 30 days	Better adaptation to stress (qualitative), more "manageable"

Table 3. Anxiety Outcomes

Study	Population	Extract/ Dose	Anxiety Outcome
Langade 2021 RCT	40 control, 40 insomnia + healthy adult	KSM-66: 300 mg BID, 8 weeks	↓ HAM-A ($p<0.0001$) Ashwagandha group mean: 22.81 ± 0.94 → 15.92 ± 1.00 Placebo: 23.02 ± 1.02→ 21.09 ± 1.08
Remenapp 2022 RCT	58 adults w/ perceived stress (PSS > 14)	NooGandha: 225–400 mg daily, 30 days	↓ DASS-21 anxiety ($p<0.01$)
Pandit 2024 RCT	98 adults w/ chronic stress Mean HAM-A = 16.5	Sensoril: 125–500 mg daily, 8 weeks	Anxiety ↓ by week 4–8 ($p<0.001$) Week 8 results: Placebo (15.15±2.10) **WS125** (11.08±2.53, $p<0.001$) **WS250** (8.98±2.91, $p<0.001$) **WS500** (9.50±2.89, $p<0.001$)

List of Abbreviations:
SOL: Sleep Onset Latency; TST: Total Sleep Time; WASO: Wake After Sleep Onset; SE: Sleep Efficiency; PSS: Perceived Stress Scale; PSQI: Pittsburgh Sleep Quality Index; HAM-A: Hamilton Anxiety Rating Scale; DASS-21: Depression, Anxiety, and Stress Scale - 21 Item; WS125: Withania Somnifera 125 mg; WS250: Withania Somnifera 250 mg; WS500: Withania Somnifera 500 mg

Discussion

The effect of Ashwagandha supplementation on stress, anxiety and sleep was assessed in this review. When compared to placebo, oral Ashwagandha supplementation decreased levels of PSS, HAM-A, DASS-21 and PSQI. The decrease suggests a benefit for subjective and objective stress. The drop in sleep measures (sleep onset latency, total sleep time, and sleep efficiency) may also be indicative of Ashwagandha's GABAergic characteristics. Limitations in these studies include short duration (30-90 days), small sample size, absence of standardization in extract used, subjectivity of assessment tools, and a lack of research on long-term safety. Larger scale and longer studies are needed.

Conclusion

This literature review suggests that regular usage of oral Ashwagandha *(Withania somnifera)* may improve symptoms of stress, anxiety, and sleep outcomes for individuals who experience insomnia, perceived stress, and anxiety. In the 5 selected trials, reductions in validated measures of perceived stress (PSS), with some studies also reporting decreased cortisol compared with placebo. Although these findings are consistent with the proposed mechanisms in this poster, interpretation and generalization is limited due to short study duration, small sample sizes, and variability in extracts/doses.

References

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