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Review Article

Effects of *Ashwagandha* (*Withania Somnifera*) on stress and anxiety: A systematic review and meta-analysis

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Highlights

- *Ashwagandha* significantly reduced stress, anxiety, and cortisol levels compared to placebo in meta-analysis of 9 studies (558 patients).
- Decreased Perceived Stress (−4.72), Anxiety (−2.19), and serum cortisol (−2.58).
- Doses ranged 125–600 mg daily for 30–90 days; both root alone and root-and-leaf combined formulations used.
- Generally safe with some mild side effects; further research on long-term safety needed.

Abstract

Background

Ashwagandha (*Withania somnifera*) is an adaptogenic herb used to prevent and treat psychosomatic disorders. This systematic review and meta-analysis evaluated the effects and safety of *Ashwagandha* on psychosomatic functions related to stress and anxiety among patients.

Methods

A comprehensive search was conducted in MEDLINE, EMBASE, PubMed, PsychINFO, and the Cochrane Library for articles published from January 2000 to January 2022. Randomized controlled trials that examined the effects of *Ashwagandha* on stress and anxiety were included. Two authors independently extracted all relevant data from the included studies. Both subjective and objective measures of stress and anxiety were assessed as outcome variables.

Result

Nine randomized controlled trials involving 558 patients were eligible for this study. The findings of the meta-analysis showed a significant effect of *Ashwagandha* formulations on the Perceived Stress Scale (PSS) (MD = −4.72, 95 % CI = [−8.45 to −0.99]), Hamilton Anxiety Scale (HAS) (MD = −2.19, 95 % CI = [−3.83 to −0.55]), and serum cortisol levels (MD = −2.58, 95 % CI = [−4.99 to −0.16]) compared to the placebo group. Among the included studies, four reported mild to moderate adverse events.

Conclusion

The findings from the included studies indicate that *Ashwagandha* formulations have beneficial effects on stress and anxiety. The adverse effects associated with *Ashwagandha* are limited; however, further information is required to determine its safety with long-term administration.

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Background

Interest in herbal medicinal products and supplements is increasing, with an estimated 80 % of people worldwide using herbal medicines in primary healthcare.¹ Although many phytonutrients of the herbal extracts are used for a long time, the scientific evidence on the efficacy of these herbal medicines is still debatable. *Withania somnifera* (*L.*) *Dunal*, known as "*Ashwagandha*" in Sanskrit, is a plant used in traditional Indian medicine. It belongs to the Solanaceae family² and has several names, ...

Materials and methods

The systematic review and meta-analysis were conducted according to the PRISMA guidelines.¹⁰ ...

Eligible studies

The literature selection process (Fig. 1) was done by three independent authors (MK, STV, and RBB). We have identified 360 potential articles and eligible records from the literature search. In total, 347 articles were excluded after removing possible duplication, records not retrieved, articles published in languages other than English, and abstract and title screening. According to the inclusion and exclusion criteria, 13 potential articles were retrieved after carefully reading the full text ...

Effect of *Ashwagandha* on stress

Five studies^{15, 16, 17,19,23} examining *Ashwagandha* effects on stress levels (Figs. 4 and 5) reveal a significant overall reduction in stress (pooled effect size: −4.72, 95 % CI: −8.45 to −0.99). Individual study effects ranged from −11.80 to −1.63, with most showing statistically significant stress reduction. However, high heterogeneity ($I^2 = 86 %$, $p < 0.001$) indicates considerable variability in intervention effects across studies. The wide prediction interval (−14.84 to 5.40) suggests diverse ...

Discussion

This meta-analysis provides the first comprehensive evaluation of *Ashwagandha* effects on stress, anxiety, and cortisol levels. The findings demonstrate statistically significant improvements in overall stress and anxiety, with a notable reduction in serum cortisol levels. These results suggest that *Ashwagandha* may be a promising natural intervention for the stress and anxiety management.

The observed effects are likely attributable to *Ashwagandha* active components, particularly withanolides and ...

Conclusion

In conclusion, this meta-analysis provides promising evidence for the efficacy of *Ashwagandha* in reducing stress, anxiety, and cortisol levels. While these findings are encouraging, they should be interpreted in the context of the study's limitations. Further high-quality research is needed to establish optimal treatment protocols and long-term safety profiles. Nonetheless, *Ashwagandha* represents a potentially valuable natural intervention in the growing integrative mental health care field. ...

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CRediT authorship contribution statement

Velan Arumugam: Writing – review & editing, Writing – original draft, Methodology, Conceptualization. **Venugopal Vijayakumar:** Validation, Supervision, Project administration, Investigation, Data curation. **Arthi Balakrishnan:** Writing – review & editing, Writing – original draft, Software, Data curation, Conceptualization. **Rudra B Bhandari:** Writing – review & editing, Visualization. **Deenadayalan Boopalan:** Software, Data curation. **Ramesh Ponnuram:** Investigation. **Venkateswaran Sankaralingam** ...

Acknowledgment

Nil ...

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