

TOPIC 9 · SLEEP, CIRCADIAN RHYTHMS & FERTILITY

What we know about sleep quality and duration, chronotype, shift work, natural conception and IVF outcomes.

Why 8 core sources?

Eight is the ideal number here. The field is relatively new and much of the evidence is observational. These sources provide the right balance: a recent systematic review, three contemporary IVF studies, one study using objective sleep monitoring, a prospective preconception cohort, a meta-analysis of shift work and a review of circadian mechanisms.

The evidence in context

Sleep and circadian rhythms are biologically important components of general health and interact with hormonal and metabolic systems involved in reproduction. Contemporary studies associate poor sleep quality, disrupted timing and some forms of circadian disruption with lower fecundability or less favourable IVF outcomes. Findings are not fully consistent, however, and most research does not establish causality. The scientifically responsible message is that regular, good-quality sleep is a reasonable part of preconception health and overall well-being - not a proven 'fertility treatment' and not another obligation for which women should feel responsible or guilty.

1. Li et al. (2024)

Sleep disturbances and female infertility: a systematic review

[Original source](#)

What it studied → A systematic review of the literature on sleep disturbances in relation to female infertility and fertility-treatment outcomes.

What it found → The overall evidence suggested negative associations between disturbed sleep, female infertility and some adverse fertility-treatment outcomes. The authors emphasised the need for more longitudinal studies to confirm these relationships.

What it means in practice → Sleep deserves assessment as part of broader preconception and fertility care. However, poor sleep cannot be described as a proven cause of infertility, nor can sleep improvement be promised to improve outcomes.

Limitations → Substantial heterogeneity in definitions of poor sleep, different measurement tools and a predominance of observational data, limiting causal inference.

2. Liu et al. (2023)

The impact of sleep on in vitro fertilization embryo transfer outcomes

[Original source](#)

What it studied → A study of women undergoing IVF-ET assessing sleep quality, sleep duration and chronotype in relation to clinical reproductive outcomes.

What it found → Better sleep quality was associated with more favourable IVF-ET outcomes, particularly clinical pregnancy and live birth. The association appeared stronger among women younger than 35.

What it means in practice → Sleep quality may be a useful modifiable component of overall IVF preparation, but the association does not prove that improving sleep itself increases live birth.

Limitations → Observational design, possible residual confounding and self-reported sleep measures. Stress, health status, BMI and other factors may influence the relationship.

3. Bariya et al. (2025)

Impact of sleep characteristics on IVF/ICSI outcomes

[Original source](#)

What it studied → A contemporary study examining sleep quality, sleep-onset difficulty, duration and daytime napping in relation to IVF/ICSI outcomes.

What it found → Poor sleep quality, frequent difficulty falling asleep and long sleep duration were associated with less favourable IVF/ICSI outcomes. Longer daytime napping was also associated with lower oocyte-maturation rates in some subgroups.

What it means in practice → There does not appear to be a simple 'more sleep is always better' rule. Quality, regularity and the overall sleep pattern may matter more than a single number of hours.

Limitations → Observational design and multiple comparisons. Sleep characteristics may reflect other health or lifestyle factors and do not establish causality.

4. Yao et al. (2022)

Associations of sleep characteristics with outcomes of IVF-ET

[Original source](#)

What it studied → A study linking detailed sleep characteristics with oocyte yield, fertilisation, embryo quality and clinical pregnancy in women undergoing IVF.

What it found → Frequent difficulty falling asleep was associated with fewer mature oocytes, normally fertilised oocytes and good-quality embryos. Sleeping 9 to <10 hours was associated with lower odds of clinical pregnancy compared with 7 to <8 hours.

What it means in practice → The sleep-IVF relationship may be non-linear. The finding does not mean women should mechanically target a specific number of hours, but it supports attention to regular, good-quality sleep.

Limitations → Observational associations, potential confounding and self-reported sleep. It does not show that changing sleep duration changes IVF outcome.

5. Pimolsri et al. (2021)

Objective sleep duration and timing predicts completion of in vitro fertilization treatment

[Original source](#)

What it studied → A study using objective sleep monitoring during IVF, examining duration, awakenings, sleep efficiency and timing in relation to completion of the cycle through embryo transfer.

What it found → Women whose IVF cycles were cancelled before embryo transfer had shorter sleep duration, more nocturnal awakenings, lower sleep efficiency and later sleep timing. Longer sleep was associated with lower odds of an incomplete cycle.

What it means in practice → Objective measurement strengthens interest in sleep as a possible marker of overall physiological and psychological state during IVF.

Limitations → Small sample and observational design. Cycle cancellation is influenced by many biological factors, so sleep may be a marker rather than a cause.

6. Willis et al. (2019)

Female sleep patterns, shift work, and fecundability in a North American preconception cohort study

[Original source](#)

What it studied → A prospective North American preconception cohort of women aged 21-45 attempting natural conception, assessing sleep duration and quality, chronotype and shift work in relation to fecundability.

What it found → The study did not show a strong, simple relationship between most sleep patterns and fecundability. Some subgroups and extreme patterns suggested differences, but the overall picture was more modest than is often implied publicly.

What it means in practice → This is an important counterbalance: sleep matters for health, but women should not be led to believe they cannot conceive because they are sleeping 'wrong.'

Limitations → Self-reported sleep and shift-work exposure, possible residual confounding and limited ability to capture changes in sleep during the trying-to-conceive period.

7. Stocker et al. (2014)

Influence of shift work on early reproductive outcomes: a systematic review and meta-analysis

[Original source](#)

What it studied → A systematic review/meta-analysis of shift work in relation to early reproductive outcomes, including menstrual disturbance, infertility and early pregnancy loss.

What it found → The review found evidence of associations between shift work and some adverse early reproductive outcomes. However, the authors concluded that evidence was insufficient to advise women of reproductive age to restrict shift work.

What it means in practice → Shift work is a plausible marker of circadian disruption worth considering, but changing jobs should not be promoted as a fertility intervention on the basis of current evidence.

Limitations → Heterogeneous definitions of shift work, observational studies, different occupations and substantial potential confounding from lifestyle, stress and socioeconomic factors.

8. Mills & Kuohung (2019)

Impact of circadian rhythms on female reproduction and infertility treatment success

[Original source](#)

What it studied → A review of circadian rhythms in relation to female reproduction, fertility and early pregnancy outcomes, integrating basic biology with human evidence.

What it found → The literature supports a biologically plausible interaction between circadian timing and the reproductive axis, while circadian disruption has been associated with selected reproductive disorders. Human clinical evidence remains limited and heterogeneous.

What it means in practice → We can explain why regular sleep and day-night timing are biologically relevant without claiming that 'resetting the circadian rhythm' is an established infertility treatment.

Limitations → A review incorporating mechanistic, animal and human evidence of varying quality. Biological plausibility does not equal proven clinical benefit.

Library conclusion

The relationship between sleep and fertility is interesting and biologically plausible, but it is not yet as certain as social-media claims often imply. Repeated associations exist between poor sleep and selected adverse fertility/IVF outcomes, but there is no proof that sleep is an independent cause of infertility or that a particular sleep schedule increases live birth. The website should present sleep as part of comprehensive health care, with persistent insomnia, very poor sleep quality, sleep-disordered breathing or major circadian disruption warranting appropriate medical assessment.

Template for future maintenance

Keep separate evidence categories for sleep quality, sleep duration, sleep timing/chronotype, shift work/circadian disruption, sleep disorders and IVF outcomes. Prioritise prospective cohorts, objective sleep measures and intervention trials as they become available. For every new source: Full citation + link → What it studied → What it found → What it means in practice → Limitations → Date last reviewed.