

# INPLASY PROTOCOL

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**Support: None.**

**Review Stage at time of this submission: Preliminary searches.**

**Conflicts of interest:**  
None declared.

## Effects of Yoga on stress in stressed adults – registry of a systematic review and meta-analysis

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**Review question / Objective:** Effects of yoga interventions on stress in stressed adults compared to passive and active controls.

**Eligibility criteria:** Inclusion criteria:- Age  $\geq$  18 years - Self-report as stressed Exclusion criteria:- studies investigating yoga in participants with a specific medical condition (e.g. cancer, back pain, anxiety)- studies that actively induced stress in participants - studies investigating yoga in stressful situations (e.g. stage fight, exam situation).

**Main outcome(s):** The primary outcome is the self-reported stress level. It has to be reported at least at baseline and after intervention. Common scales of stress measurement will be included, e.g. Perceived Stress Scale.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 17 March 2023 and was last updated on 17 March 2023 (registration number INPLASY202330062).

## INTRODUCTION

**Review question / Objective:** Effects of yoga interventions on stress in stressed adults compared to passive and active controls.

**Rationale:** Yoga is gaining popularity as a form of stress management among the general population in Western cultures (1,2). However, the effects of Yoga on stress are not well understood. Given the frequency with which people are choosing such practices to reduce their stress levels,

it is important to determine their effectiveness. The purpose of this systematic review is to investigate the efficacy and safety of yoga interventions in treating stress in stressed adults in the general population.

**Condition being studied:** Subjective Stress.

## METHODS

**Search strategy:** For literature search, search terms were created and modified upon requirements of other databases. As an example, the search term for PubMed is presented: ("Yoga"[Mesh] OR yoga\*[Title/Abstract] OR yogi\*[Title/Abstract] OR asana\*[Title/Abstract] OR pranayama [Title/Abstract] OR dhyana [Title/Abstract] OR dharana [Title/Abstract] OR "Surya Namaskar\*" [Title/Abstract]) AND (stress\*[Title/Abstract] OR "Stress, Psychological"[Mesh] OR "Stress, Physiological"[Mesh] OR "Occupational Stress"[Mesh] OR "Psychological Distress"[Mesh] OR "Financial Stress"[Mesh]).

**Participant or population:** Adults defined as healthy or as part of the general population, who self-report as stressed without a relation to a medical condition. No age restrictions are applied. No restriction regarding gender and ethnicity are made.

**Intervention:** Studies that compared yoga with no treatment, other passive treatments, or any active treatment are eligible. Studies are excluded if yoga is not the main intervention but a part of a multimodal intervention, such as mindfulness-based stress reduction or mindfulness-based cognitive therapy. Any form of yoga is eligible (i.e. Hatha yoga, Ashtanga yoga, Iyengar yoga, Yoga therapy or any other yoga form). Studies that do not mention a specific form of yoga but simply described the intervention as 'yoga' are also eligible. Interventions include at least one of the following: yoga postures (asana), breath control (pranayama), meditation (based on yoga theory or traditional yoga practices).

**Comparator:** Attention control, wait-list control, no therapy and any other active therapy are eligible as comparators.

**Study designs to be included:** Only randomized controlled trials (RCTs) are considered eligible.

**Eligibility criteria:** Inclusion criteria:- Age  $\geq$  18 years - Self-report as stressed  
Exclusion criteria:- studies investigating yoga in participants with a specific medical condition (e.g. cancer, back pain, anxiety)- studies that actively induced stress in participants - studies investigating yoga in stressful situations (e.g. stage fight, exam situation).

**Information sources:** The following databases will be screened: Medline, Cochrane, Scopus and PsycInfo. As a source of grey literature, BASE will be screened.

**Main outcome(s):** The primary outcome is the self-reported stress level. It has to be reported at least at baseline and after intervention. Common scales of stress measurement will be included, e.g. Perceived Stress Scale.

**Additional outcome(s):** As secondary outcomes, health related quality of life and stress-related physiological measures will be assessed. For safety measurement, the number of patients with serious adverse events (SAE) and the number of patients with adverse events (AE) will be assessed.

**Data management:** Citavi is used as software for managing literature and documenting decision-making. Data extraction is done in Excel, and statistical analyses are performed in R and R Studio. First, the titles, then the abstracts, and finally the full texts are independently checked for suitability by two authors. In case of disagreements, a third author will be involved in the decision making. Further disagreements will be discussed until consent is reached.

**Quality assessment / Risk of bias analysis:** The Cochrane risk of bias tool 2.0 will be

used to perform the risk of bias analysis. The risk of bias for all included studies will be assessed by 2 authors independently. In case of disagreements, a third author will be involved in the decision making. Further disagreements will be discussed until consent is reached.

**Strategy of data synthesis:** Pooled analyses are performed when at least two studies are available for a given outcome. For continuous outcomes, standardized mean differences (SMD) with 95% confidence intervals (CI) are calculated. When standard deviations are not available, they are calculated from standard errors, confidence intervals, or t values. For dichotomous outcomes, odds ratios (OR) are calculated with 95% CI (3,4). Hedges correction is utilized for small study samples (3,4). In the absence of data, an attempt is made to obtain the missing data from the authors. Random-effects models are calculated using the inverse variance method for continuous outcomes and the Mantel-Haenszel method for dichotomous outcomes (5). Statistical heterogeneity between studies is examined using the I<sup>2</sup> and  $\tau^2$  statistics. If statistical heterogeneity is detected and at least 10 studies are included in the respective meta-analysis, subgroup analyses and meta-regressions are also performed to investigate possible reasons for heterogeneity (3,4,5). For better comparability in the presence of non-significant heterogeneity, fixed-effects model estimates will be included in the forest plots. In addition, the Hartung-Knapp correction for small samples is applied (6). Separate analysis will be conducted for different types of control groups (as described earlier).

**Subgroup analysis:** Subgroup analyses will be performed for different lengths of interventions and for different types of interventions (e.g. interventions with only yoga postures, interventions with only breath control, etc).

**Sensitivity analysis:** Sensitivity analyses will be conducted for studies with high versus low risk of bias to test the robustness of significant results.

**Language restriction:** The following languages are included: English, German, Italian, Spanish, French, Croatian, and Russian.

**Country(ies) involved:** Germany.

**Keywords:** Yoga; Stress; Complementary medicine.

**Dissemination plans:** The review will be published in a peer reviewed scientific journal. Results of this review will be presented at scientific congresses.

#### **Contributions of each author:**

**Author 1 - Laura Burgahn -** conceiving, designing and coordinating the review, creation of search strategy, study selection, data collection, data management, interpretation of data, writing the protocol and review.

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- References:** (1) Penman, S., Cohen, M., Stevens, P., Jackson, S., 2012. Yoga in Australia: results of a national survey. *Int. J. Yoga* 5, 92–101.
- (2) Cramer H, Ward L, Steel A, Lauche R, Dobos G, Zhang Y. Prevalence, Patterns, and Predictors of Yoga Use: Results of a U.S. Nationally Representative Survey. *Am J Prev Med.* 2016 Feb;50(2):230-5.
- (3) Borenstein M, Hedges LV, Higgins JPT, Rothstein HR. *Introduction to Meta-Analysis.* Chichester: John Wiley & Sons, Ltd, 2009.
- (4) Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA (editors). *Cochrane Handbook for Systematic Reviews of Interventions.* 2nd Edition. Chichester (UK): John Wiley & Sons, 2019.
- (5) Harrer, M., Cuijpers, P., Furukawa, T.A., Ebert, D.D. *Doing Meta-Analysis with R: A Hands-On Guide.* Boca Raton, FL and London: Chapman & Hall/CRC Press, 2021.
- (6) Cornell JE, Mulrow CD, Localio R, Stack CB, Meibohm AR, Guallar E, Goodman SN. Random-effects meta-analysis of inconsistent effects: a time for change. *Ann Intern Med* 2014;160(4):267-270.