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REVIEW ARTICLE

An Integrative Review on Sun Salutation for Health Outcomes Among Working Women: Implications for Corporate Women

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ABSTRACT

Introduction: In today's society, women are juggling multiple roles, including careers, leading to both empowerment and challenges in maintaining good health. Many working women, especially in the corporate world, seek time-efficient and affordable ways to stay healthy. Sun Salutation (SS), a sequence of 12 yoga postures combined with breathing and mindfulness, supports physical fitness, physiological and mental health, making it a valuable daily practice. This review synthesizes available evidence on the promising effect of SS practice on health outcomes among working adults and adult women, with particular attention to its potential implications for corporate women and their productivity.

Methods: Considering predefined inclusion criteria and following the PRISMA guidelines, nine studies, including six on working adults where two specifically on women as direct evidence, while three were from mixed sex and one study not mentioned about sex as indirect evidence and other three supportive studies on age-matched healthy women, were identified through a comprehensive search of electronic databases, including Google Scholar, Web of Science, DOAJ, ScienceDirect, Scopus, and PubMed. Methodological quality of selected studies was assessed using the Critical Appraisal Skills Programme, and risk of bias was evaluated using Cochrane RoB 2 and ROBINS-I for randomized and non-randomized studies, respectively.

Results: The study findings revealed that the regular practice of Sun Salutation (SS) is associated with promising impact in reducing stress, anxiety, blood pressure, and an increase in pulmonary function, forced vital capacity, cognitive function and quality of life. Additionally, supportive evidence demonstrated significant beneficial effects of SS on body mass index (BMI), body composition, cardiorespiratory endurance, muscular endurance, and flexibility among middle-aged women. However, considerable heterogeneity in study designs, participant characteristics, intervention protocols, and outcome measures influenced the overall consistency of the findings.

Conclusion: Based on the evidence, this integrative review suggests potential benefits of the Sun Salutation practice for selected physical, physiological and psychological health outcomes, while limited studies were conducted on corporate women and workplace productivity. Therefore, well-designed and high-quality controlled studies need to be conducted to generalize the findings.

Keywords: Yoga; Sun Salutation; Working Women; Mental Health; Well-Being

INTRODUCTION

In contemporary society, women are increasingly engaging in diverse professional fields, reflecting significant socio-economic and cultural transformations. Women now hold influential positions in policymaking, entrepreneurship, academia, media, management, and community development. Globally, women constitute 42% of the workforce, with 28.2% employed in the corporate sector. In India, women account for 32.8% of the overall workforce and 26.8% within corporate roles (1). Although employment offers advantages such as financial independence, career advancement, and personal empowerment, it also introduces occupational demands that may adversely affect women's physical, physiological, and psychological health (2,3). The modern working environment, including corporate sectors, is characterised by long working hours, sedentary routines, demanding workload, poor ergonomics and high psychosocial stress (4). These occupational exposures have been associated with musculoskeletal discomfort, reduced physical activity, obesity, hypertension, cardiovascular risk factors, mental fatigue, anxiety, perceived stress, burnout, sleep disturbances, and diminished quality of life (5,6). Such health concerns not only influence individual well-being but may also affect work engagement, absenteeism, and overall workplace functioning (7). Additionally, physical inactivity contributes to obesity, cardiovascular risks, and reduced mobility (8–10). In recent years, companies and organisations have increasingly committed to implementing Workplace Health Promotion (WHP) initiatives aimed at protecting and enhancing the health of their workforce. The International Labour Organisation (ILO) underscores the growing importance of new roles within organisations focused on occupational health, particularly in areas such as health promotion, the prevention and management of emerging psychosocial risks, mental health conditions, and non-communicable diseases (11,12). In this perspective, health professionals, sports scientists, and fitness experts are exploring sustainable wellness programs tailored to time constraints, fitness levels, and specific health goals (12–14).

The wide variety of workplace wellness interventions, yoga has attracted much scientific attention due to its possible positive effects on physical and physiological fitness, psychological wellbeing, stress reduction and on overall quality of life. Previous reviews and intervention studies suggested that the implementation of yoga programs could positively affect flexibility, strength, balance, cardiopulmonary performance, stress, anxiety, depression, sleep quality, and perceived well-being across diverse populations (15,16). However, yoga consists of a large number of practices, including physical exercises (asanas), breathing (pranayama), meditation, relaxation, and integrated yoga programs. Consequently, evidence regarding yoga as a whole should not be considered equivalent to evidence regarding any individual yogic practice.

Originated in ancient Indian tradition, Sun Salutation (Surya Namaskar) is a distinctive yogic practice involving a series of 12 postures which are coordinated with breathing exercises. The observed effect of this practice may be related to the combined effect of physical movement, breath control, and mindfulness, promoting physical vitality and mental clarity (17). An increasing number of studies suggest that the SS is an effective mind–body practice for enhancing psychological well-being and overall health (18,19). Empirical studies have reported that regular practice of SS is associated with improvements of stress, anxiety, perceived well-being, specific physiological indices, and physical fitness (2,20). Some researchers indicate positive changes in cognitive function and quality of life (21,22); however, evidence regarding workplace productivity, job satisfaction, and work performance remains limited (23). Prior studies have suggested the potential role of the autonomic nervous system and mindful awareness, which modulate neurophysiological pathways, particularly the hypothalamic–pituitary–adrenal (HPA) axis however, the current review did not investigate these mechanisms. Thus, these physiological theories can be regarded as probable interpretations, not established mechanisms of action (24,25).

The sequences of bending and stretching movements counteract the effects of prolonged sitting by enhancing joint mobility, increasing flexibility, and reducing muscular stiffness, particularly in the hips, hamstrings, and shoulders (18,19). It strengthens core and back muscles, improves posture, and alleviates neck and back pain. The studies considered for the current review revealed that, physiologically, the practice of SS significantly changes blood pressure, resting heart rate, pulmonary function, and body-composition-related measures among practitioners (26,27). These findings indicate potential physiological benefits of SS; however, they lacks in studying mechanisms underlying these changes. Further, a study conducted on desk-based workers reveals that integrating SS into daily corporate routines may promote active work environments, encourage screen-time breaks, and overall health (6). Hence, collectively, these findings suggest that Sun Salutation may simultaneously influence psychological, physiological, and physical health, highlighting its potential as a comprehensive workplace wellness intervention.

Nevertheless, despite such promising results, the current body of knowledge significantly varies with regard to methodology, participants' characteristics, intervention length, outcome measurements, and quality of studies, thus making it hard to provide clear conclusions concerning the effectiveness of Sun Salutation in corporate setting. While there is a vast number of yoga-based interventions in the workplace that have been studied, relatively few studies have specifically evaluated Sun Salutation as an independent intervention. Furthermore, studies conducted exclusively among corporate women are scarce. Therefore, the current integrative review gathered existing evidence from heterogeneous populations, such as healthcare providers, university workers, software developers, and healthy adult females, but the findings of those evidence limit its application to corporate settings. Keeping in view these limitations, this current review aims to critically synthesise the available evidence to interpret the existing findings and, at the same time, locate the research gaps and direction for future research among corporate women.

METHODS

The present study employed a narrative integrative literature review design to systematically collect, evaluate, and synthesise existing empirical and theoretical evidence regarding the impact of Sun Salutation (SS) practice on physical abilities, psychological health, physiological functioning, and workplace productivity among corporate women. The review methodology followed the integrative review framework proposed by Whittemore and Knafl (28,29), which includes the following stages: identification of the research problem, literature search, data evaluation, data analysis, interpretation of findings, and presentation of results. In addition, the studies' reporting and screening processes followed the PRISMA guidelines (30).

Research Question

The literature search was guided by the following research questions:
What are the recommended procedures for practising Sun Salutation among women?
What evidence exists regarding the effects of Sun Salutation on physical, physiological, and psychological health outcomes of working women?
What evidence exists regarding the effect of regular Sun Salutation practice on work efficiency among working women with special considerations to corporate women?

Literature Search Strategy

A comprehensive and systematic literature search was conducted across multiple electronic databases, including Scopus, PubMed, Web of Science, DOAJ, ScienceDirect, and Google Scholar, to identify relevant peer-reviewed studies published in English during the last fifteen years (2010–2025). The database search was conducted from March to May, 2025 which ended on 25th May.
The search strategy combined Medical Subject Headings (MeSH) terms and free-text keywords using Boolean operators (“AND,” “OR”). The primary search terms included:
“Surya Namaskar” OR “Sun Salutation”
AND
“Corporate women” OR “working women” OR “female employees” OR “occupational women” OR “adult women” OR “healthy women”
AND
“health” OR “physical fitness” OR “mental health” OR “psychological well-being” OR “physiological parameters” OR “productivity” OR “occupational health”.
Additional search combinations such as “Sun Salutation for corporate women,” “Surya Namaskar for adults,” “Sun Salutation for occupational health,” “Sun Salutation for female employees,” and “Sun Salutation for overall health” were also used to maximise retrieval of relevant literature. The database-specific search strategy is depicted in supplementary Table S1.
Particularly for Google Scholar, the first 10 pages of results were manually screened as per the order given by the database, and potentially eligible records were identified based on predefined population, intervention, and outcome criteria. The reference lists of included studies were also manually checked for further identification, and those were assessed using the same eligibility criteria.

Study Selection and Screening Process

All identified records were exported into reference management software (Zotero), and duplicate studies were removed before screening. A total of 110 records were obtained through database searching, including Scopus (n = 20), PubMed (n = 17), Web of Science (n = 10), DOAJ (n = 12), ScienceDirect (n = 20), and Google Scholar (n = 31). After eliminating 57 duplicate records, 53 articles remained for screening. Additionally, four studies (n = 4) were identified from reference list searches.
The screening and selection process was performed independently by two reviewers (SM, DM) in three sequential stages: title screening, abstract screening, and full-text assessment using the PICOS framework—Participants (P), Intervention (I), Comparator (C), Outcomes (O), and Study Design (S) (32).
After title screening, out of 53 studies, 14 articles with irrelevant titles were excluded. Following this, 12 other articles were excluded based on the abstract screening as they did not meet the predefined inclusion criteria. Thus, the remaining 27 articles underwent independent full-text assessment. During the full-text review, 18 studies were excluded because they did not meet the eligibility criteria, including studies with interventions mixed with other forms of yoga (n = 10), publications not available in English (n = 4), and studies lacking clearly defined outcome measures (n = 4). Further, among the four (n = 4) articles identified from reference list one (n = 1) was excluded as a duplicate, and three (n = 3) were considered for full-text assessment, after which they were excluded because of mixed interventions (n = 2) and acute SS effect (n = 1).
Any disagreements regarding study eligibility were resolved through discussion and consensus. If consensus could not be reached, a third reviewer (NB) was consulted to make the final decision. Finally, nine studies met the eligibility criteria were included in the integrative review. Of these, two studies involved working women and provided direct evidence, three studies involved working professionals of both sexes, and one study did not specify the sex of the participants; these four studies were considered indirect evidence. The remaining three studies involved healthy adult women and were considered supportive evidence. The complete study selection process is presented in the PRISMA flow diagram (Figure 1).

Inclusion Criteria

The pre-defined inclusion criteria (PICOS framework) in this study are as follows- Participants (P): Participants were non-clinical healthy adults preferably women working in any sector including corporate, aged between 18 and 64 years; Intervention (I): The intervention of Sun Salutation practice with any frequency and duration was included; Comparator (C): Any comparator (e.g., no intervention, usual care, wait-list control, or other interventions) or no comparator for single-group pre–post studies; Outcomes (O): Study outcomes that investigated the effect of Sun Salutation on any variable of a wide range of health domains, including physical, psychological measures, hormonal and other physiological parameters; Study Design (S): Randomised controlled trials, pre-post and pilot studies published in recent past.

Exclusion Criteria

Studies were excluded if they (i) Involved clinical populations, (ii) Studies conducted on male adults, (iii) Lacked clear health outcome measures.

Data Extraction

Data from the selected studies were extracted independently by two reviewers using a standardised data extraction form. Extracted information included author name, publication year, country, study design, participant characteristics, sample size, intervention protocol (frequency, duration, and intensity), outcome variables, assessment tools, key findings, and conclusions. The extracted data were cross-verified among reviewers to ensure accuracy and consistency.

In the context of mixed-sex studies, female-specific outcome estimates were extracted when reported separately, while where sex-specific outcomes were not available, estimates from the whole sample were taken into account and the results were categorized as indirect evidence.

Assessment of Study Quality

The methodological quality of the included studies was critically evaluated using the Critical Appraisal Skills Programme (CASP) (31) with the checklist selected and applied according to the study design (i.e., CASP Randomized Controlled Trial Checklist for randomized controlled trials and CASP Cohort Study Checklist for non-randomized/cohort studies). The CASP tool comprises 11 questions for randomized controlled trials and 12 questions for non- randomized/ cohort studies, assessing study validity, methodological rigour, bias control, data analysis, clarity of outcomes, ethical considerations, and applicability of findings.

Each included study was independently appraised by three reviewers using response categories of “Yes,” “No,” or “Can’t tell.” Quality assessment and reviewer comments were compared, and any disagreements were resolved through discussion and consensus. The CASP assessment was used to identify methodological strengths and limitations of the included studies and was not used as a numerical threshold for study exclusion.

Risk of Bias Assessment

Risk of bias was assessed according to the study design using validated appraisal tools. The two randomized controlled trials were evaluated using the Cochrane Risk of Bias 2 (RoB 2) tool, while the seven non-randomized studies were assessed using the Risk of Bias in Non-randomized Studies of Interventions (ROBINS-I) tool (32,33). RoB 2 evaluates bias related to the randomization process, deviations from intended interventions, missing outcome data, outcome measurement, and selection of reported results. ROBINS-I assesses bias arising from confounding, participant selection, intervention classification, deviations from intended interventions, missing data, outcome measurement, and selective reporting. Risk-of-bias assessments were conducted independently by two reviewers, with disagreements resolved through discussion and consensus. The results were reported separately according to study design and were considered during the synthesis and interpretation of the review findings.

Data Synthesis

A narrative thematic synthesis approach was adopted due to heterogeneity in study designs, intervention duration, outcome measures, and participants' characteristics. The findings of the included studies were systematically grouped into major themes related to:

Procedure and practice characteristics of Sun Salutation,

Physical and physiological health benefits,

Psychological and emotional well-being, and

Workplace productivity and cognitive functioning.

The synthesised evidence was critically interpreted to identify patterns, consistencies, and gaps in the existing literature regarding the effectiveness of Sun Salutation among corporate women.

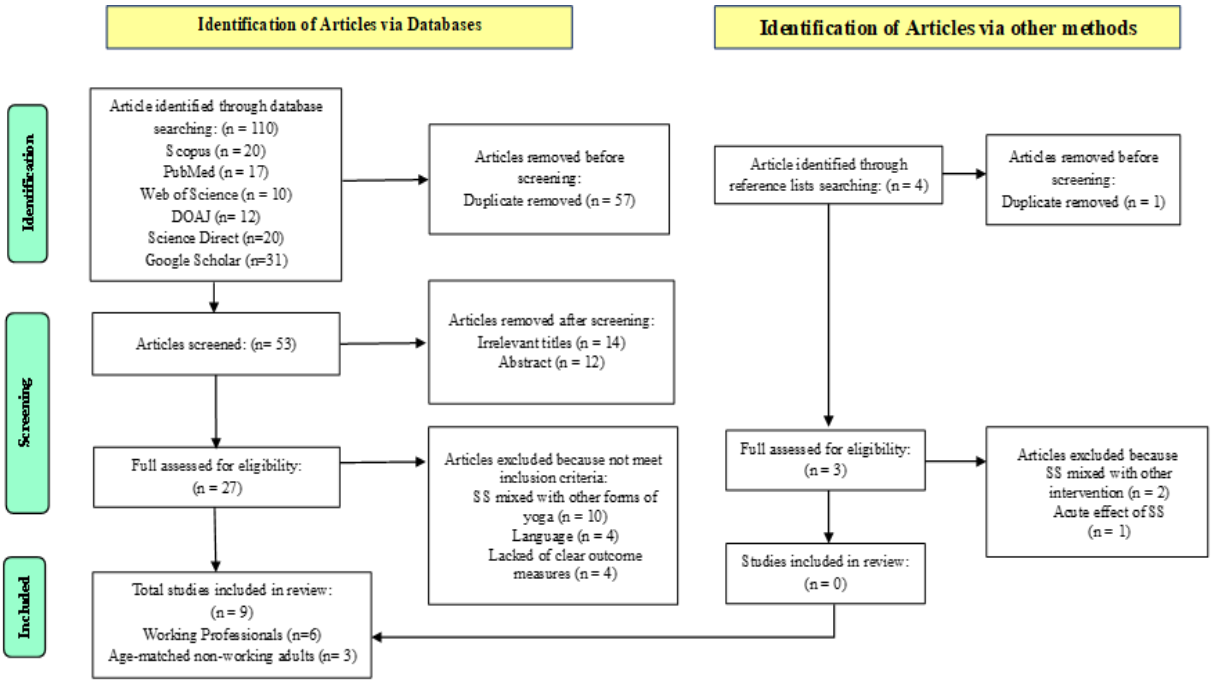


Figure 1. PRISMA Flowchart of the search process

RESULTS

Study Characteristics

Although the current investigation primarily focused on working women, but in the present study, healthy adult women were considered, as there were very few studies identified on working women. Because of very negligible evidence identified on working women, the current integrative review considered the studies from heterogeneous population such as exclusively on working women, working women from both sex population and from not reported population but excluded only studies conducted exclusively on males. Out of 110 initial articles, only nine studies were included for the current review, of which two studies (10,34) were exclusively on working women, considered as direct evidence, one study (3) did not mention the sex of the participants, while the other three (21–23) were on working adults of both sexes; and female-specific outcome data were not reported separately. Therefore, the outcome data from these studies were extracted at the whole-sample level and considered as indirect evidence and the other three relevant age-matched studies (8,35,36) were on adult non-working women, considered as supportive evidence published between 2011 and 2024. Further six studies (3,10,21–23,34) out of nine were across various working professions, with three studies specifically focusing on IT profession (3,22,34) among which one on IT sector female employee (34), one on engineering professionals from both sexes (female 84 out of 140) (22) and one on software employees (3) where the particular sex was not mentioned, one on health care workers (23), one on university employees (21) and one on working women (10).

Five of the six studies on working adults were conducted in India (3,10,22,23,34) and one in the USA (21). Among the 364 working participants, 244 were female, although one study did not report the sex of its participants (3). The participants' ages ranged from 18 to 64 years. In the present review, out of six studies, only two studies included a control group (21,22), one study included two experimental groups of SS (fast SS group and slow SS group) along with an alternative treatment (Asana) group (34), and the remaining three studies had no control or other intervention group (3,10,23). The duration of the Sun Salutation intervention in these studies ranged from one month to six months, with substantial variation in session frequency and duration. Three (3,21,23) out of the six included studies in the current review assessed stress as an outcome variable and reported significant improvement; one study (10) evaluated BMI and blood pressure (BP), where only systolic blood pressure (SBP) showing a significant decrease; one study (34) measured forced vital capacity (FVC), resting heart rate (RHR), and pulmonary ventilation rate (PVR), and found a significant increase in FVC along with reductions in RHR and PVR, indicating notable improvements in cardiorespiratory health and one study specifically assessed quality of life (22), while the remaining one measured cognitive function that indicated significant improvement particularly in the domain of working memory (21).

Additionally, the other three relevant supportive age-matched studies on non-working women (8,35,36), conducted in India, involved 167 women participants, and among those three, two studies (35,36) included a control group. One of the three studies evaluated anthropometric variables (BMI, mid-arm circumference, waist circumference, hip circumference, and waist-hip ratio) (8) while another study assessed flexibility, endurance, SBP, DBP, and heart rate (HR) (35), and the remaining one study (36) focused on body composition, cardio-respiratory fitness, flexibility, and muscle endurance as the outcome. All three studies reported significant improvements in all measured variables, except HR. Among the nine included studies (six involving working professionals and three involving healthy adult women), eight employed different assessment tools to

evaluate physical, physiological, and psychological outcomes, reflecting heterogeneity in outcome measurement across the included evidence, while one study did not report the assessment tools used to measure the study outcomes. The details study characteristics are depicted in Table 1.

Table 1. Characteristics of Included Studies (On Working Women and Adult Women)

Authors, Year, Country	Study Design	Sample characteristics Type of profession	Intervention Details (Sun Salutation)	Dependent variables	Assessment Tools Used	Findings
Muruguvalavan & Jayanthi, 2019 (10) India	Pre-post test (one-group)	n = 15 Sex = Female, Age = 28-42 Years Working women	Duration = 12 weeks Frequency = 5 days/week Session length = NM	BMI, SBP, DBP	NM	↓SBP (6.40%) *p*<0.05 level
Jayachitra, 2017 (34) India	Pre-post test	n = 60 Sex = Female, Age = 24-30 Years EG2 = 20 (Fast namaska), EG3 = 20 (Slow namaskar), Private IT sector employee	Duration = 12 weeks Frequency = NM Session length = 30-40 minutes Supervised session	FVC, RHR, PVR	Stethoscope and Spirometer.	↑FVC (FSN = 73.86%, SSN = 61.54%) ↓RHR (FSN = 5.29%, SSN = 4.32%) ↓PVR (FSN = 25.62%, SSN = 18.20%) *p*<0.05 level
Sagar et al. 2024 (22) India	Pre-post test	n = 140 Sex = Both, Female (84), Age = 35-40 Years, EG = 70, CG = 70 Engineering professionals	Duration = 8 weeks Frequency = 5 days/week Session length = 60 minutes	QOL	WHOQOL-BREF scale	↑QOL
Patel et al. 2024 (23) India	Pre-post test (one-group)	n = 31 Sex = Both, Female (15), Age = 25-50 Years, Health care worker	Duration = 6 months Frequency = NM Session length = NM	Stress	Health Anxiety Questionnaire (HAQ)	↓Stress (8.3%) *p*<0.0001 level
Phansikar et al. 2023 (21) USA	RCT	n = 86 Sex = Both, Female (81.4%), Age = 18-64 Years EG = 43(Moderate-intensity Sun Salutation A and B sequence with guided breathing and relaxation); CG = 43, University employee	Duration = 8 weeks Frequency = 3 times/week Session length = 50 minutes Supervised session	Stress & Anxiety, Cognitive functioning	Stress= The Perceived Stress Scale, Anxiety= The State-Trait Anxiety Inventory, Cognitive functioning= Stroop task, Task switching paradigm, Digit span forward and backward, Digit symbol substitution test	↓Stress and Anxiety (15.37%) ↑Cognitive functioning (working memory) *p*<0.05 level
Varsha, 2020, (3) India	Pre-post test (one-group)	n = 32 Sex = NM Age = 30-50 Years Software employee	Duration = 30 days Frequency = Daily Session length = 25-30 minutes Supervised Session	Professional stress	Professional Life Stress Scale (PLSS)	↓Professional stress (34.87%) *p*<0.05 level
Babar et al. 2022 (8) India	Pre-post test (one-group)	n = 40 Sex = Female Age = 30-45 Years	Duration = 30 days Frequency = daily Session length = 45 minutes	BMI, Circumference of Mid-arm, Waist, Hip, and WHR	BMI= W [kg]/H [m2], Circumference of Mid-arm, Waist, Hip= Measuring tape, WHR= Waist circumference/ Hip circumference	↓BMI (5.20%) ↓Circumference of mid-arm (2.30%), Waist (4.80%), Hip (0.9%) ↓WHR (3.90%) *p*<0.05 level
Jakhotia et al. 2015 (36) India	RCT	n = 87 Sex = Female, Age = 20-40Years EG3 (Modified Sun Salutation) = 24, CG= 20	Duration = 8 weeks Frequency = NM Session length = Not specified, practiced as maximum as possible	Body composition, Cardio-respiratory fitness, Flexibility, Muscle endurance	Body composition= Bioelectric impedance Analyzer, Cardio-respiratory fitness= Shuttle Walk and Run Test, Flexibility= Sit and reach test, Muscle endurance= Modified push up test (for upper limb); 1/4th squat test (for lower limb)	↑Cardio-respiratory fitness (14.20%) ↑Flexibility (12.51%) ↑Muscle endurance (34.38%) ↓BMI (1.65%) *p*<0.05 level
Shankar G & Pancholi B, 2011 (35) India	Pre-post test	n = 80 Sex = both; Female (40) Age = 18-40Years EG = 40, CG= 40	Duration = 2 weeks Frequency = 2 sessions/day Session length = 15 minutes	Flexibility, Endurance, SBP, DBP, HR	Flexibility= Sit and reach test; Endurance= Standard push-up test; SBP, DBP, HR= Sphygmomanometer and Stethoscope	↑Flexibility (43.12%) ↑Endurance (46.26%) ↓SBP (3.82%) ↓DBP (3.82%) *p*<0.01 level

Note. n = total number of participants, EG = experimental group, CG = control group, NM = not mentioned, QOL = quality of life, BMI = body mass index, SBP = systolic blood pressure, DBP = diastolic blood pressure, HR = heart rate, RHR = resting heart rate, FVC = forced vital capacity, PVR= pulmonary ventilation rate, WHR = waist hip ratio, FSN = Fast sun salutation group, SSN = slow sun salutation group, ↑ = increased and improved, ↓ = reduced and improved

Quality Assessment of Included Studies

Methodological quality of the included studies was determined based on the Critical Appraisal Skills Program (CASP) checklist (31), depending on the type of study design i.e., RCT and non RCTor cohort. Among the nine studies two randomized controlled trials were appraised using the CASP Randomized Controlled Trial Checklist, whereas the other seven non-randomized/cohort studies were evaluated using the CASP Cohort Study Checklist.

Overall, the randomized controlled trials met most of the CASP criteria, demonstrating a clearly focused research question, randomization, follow-up, similarity of baseline characteristics, validity of outcome measurement, and the generalizability of results. However, there were no clear indications about blinding, which led to the "Can't Tell" rating.

Similarly, the non-randomized/cohort studies satisfied most of the evaluation criteria, including having a specific objective, proper participant selection, correct measurement of exposure and outcomes, adequate follow-up, and sufficient presentation of the study findings. However, several studies had insufficient methodological information that made their answers to some of the criteria "Can't tell" or "No." Particularly, the CASP assessment was used to identify methodological strengths and limitations and was not used as a numerical threshold for study exclusion. So, the studies with insufficient methodological information were also retained for the qualitative synthesis in the current review which are depicted in Table 2.

Table 2. Methodological Quality Assessment of Included Studies Using the CASP Checklist

Study	Study design	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Muruguvalavan & Jayanthi, 2019; (10)	Non-RCT	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
Jayachitra, 2017; (34)	Non-RCT	Y	Y	Y	Y	CT	CT	Y	Y	Y	Y	Y	Y
Sagar et al. 2024; (22)	Non-RCT	Y	CT	Y	Y	N	CT	Y	Y	Y	Y	CT	Y
Patel et al. 2024; (23)	Non-RCT	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
Phansikar et al. 2023; (21)	RCT	Y	Y	Y	CT	CT	Y	Y	Y	Y	Y	Y	NA
Varsha, 2020; (3)	Non-RCT	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
Babar et al. 2022; (8)	Non-RCT	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y
Jakhotia et al. 2015; (36)	RCT	Y	Y	Y	N	CT	Y	Y	Y	Y	Y	Y	NA
Shankar & Pancholi, 2011; (35)	Non-RCT	Y	Y	Y	Y	CT	CT	Y	Y	Y	Y	Y	Y

Note. Y = yes, N = no, CT = can't tell, NA = not applicable, Q = question, RCT = randomized controlled trial

CASP question for RCT
Q1 = clearly focused issue;
Q2 = randomized allocation of participants;
Q3 = participants accounted for at study completion;
Q4 = blinding of participants, personnel, and investigators;
Q5 = baseline comparability of groups;
Q6 = equal treatment apart from the intervention;
Q7 = magnitude of treatment effect;
Q8 = precision of treatment effect;
Q9 = applicability of the findings;
Q10 = consideration of all clinically important outcomes;
Q11 = benefits outweigh harms and costs

CASP questions for non RCT/cohort
Q1 = clearly focused issue;
Q2 = appropriate recruitment of the cohort;
Q3 = accurate measurement of exposure;
Q4 = accurate measurement of outcomes;
Q5 = identification of confounding factors;
Q6 = control of confounding factors;
Q7 = completeness of follow-up;
Q8 = adequacy of follow-up duration;
Q9 = study results;
Q10 = precision of results;
Q11 = credibility of results;
Q12 = applicability of the findings

Risk of Bias Assessment

The results of the risk-of-bias assessment are presented in Tables 3 and 4. Among the two randomized controlled trials, the study by Phansikar et al. 2023 (21) was considered to have a low overall risk of bias across all domains. In contrast, Jakhotia et al. 2015 (36) was rated as having some concerns, mainly because of insufficient reporting of the randomization process, allocation concealment, and selective reporting.

Among the seven non-randomized studies, the overall risk of bias ranged from moderate to serious. The most common sources of bias were confounding, participant selection, and the absence of control groups in single-group pre-post study designs. Bias related to intervention classification and outcome measurement was generally low because the interventions were clearly described and most outcomes were measured using standardized or objective assessment methods. In particular, the results from studies with serious risk of bias were interpreted cautiously because confounding, participant selection, and the absence of control groups may have contributed to the observed changes. Overall, considering the risk-of-bias assessment, the findings were interpreted with caution and observed improvements were not credited as a causal effect of Sun Salutation, particularly among corporate women.

Table 3. Risk of Bias Assessment of Randomized Controlled Trials Using RoB 2

No.	Study	Outcome Assessed	D1 Bias Arising from the Randomization Process	D2 Bias Due to Deviations from Intended Interventions	D3 Bias Due to Missing Outcome Data	D4 Bias in Measurement of the Outcome	D5 Bias in Selection of the Reported Result	Overall ROB 2 Judgement
1	Phansikar et al. 2023 (21) USA	Stress & Anxiety, Cognitive functioning	Low	Low	Low	Low	Low	Low
2	Jakhotia et al. 2015 (36) India	Body composition, Cardio-respiratory fitness, Flexibility, Muscle endurance	Some concern	Low	Low	Some Concern	Some Concern	Some Concern

Note. ROB 2 = Cochrane Risk of Bias 2 tool, Domain-level and overall judgements were classified according to the Cochrane RoB 2 guidance as 'Low risk', 'Some concerns', or 'High risk' of bias.

Table 4. Risk of Bias Assessment of Non-randomized Studies Using ROBINS-I

No.	Study	Outcome Assessed	D1 Bias due to Confounding	D2 Bias in Selection of Participants into the Study	D3 Bias in Classification of Intervention	D4 Bias Due to Deviations from Intended Interventions	D5 Bias Due to Missing Data	D6 Bias in Measurement of Outcomes	D7 Bias in Selection of the Reported Result	Overall ROBINS-I Judgement
1	Muruguvalavan & Jayanthi, 2019 (10) India	BMI, SBP, DBP	Serious	Moderate	Low	Moderate	Low	Low	Moderate	Serious
2	Jayachitra, 2017 (34) India	FVC, RHR, PVR	Moderate	Moderate	Low	Moderate	Low	Low	Moderate	Moderate
3	Sagar et al. 2024(22) India	QOL	Moderate	Moderate	Low	Moderate	Low	Moderate	Moderate	Moderate
4	Patel et al. 2024 (23) India	Stress	Low	Moderate	Low	Moderate	Low	Low	Moderate	Moderate
5	Varsha, 2020 (3) India	Professional stress	Moderate	Moderate	Low	Moderate	Low/ Moderate	Low	Low	Moderate
6	Babar et al. 2022 (8) India	BMI, Circumference of Mid-arm, Waist, Hip, and WHR	Serious	Moderate	Low	Moderate	Low	Low	Moderate	Serious
7	Shankar & Pancholi, 2011(35) India	Flexibility, Endurance, SBP, DBP, HR	Moderate	Moderate	Low	Moderate	Low	Low	Moderate	Moderate

Note. ROBINS-1-Risk of Bias in Non- Randomized Studies of Interventions, HR= Heart Rate, RHR = resting heart rate, SBP = systolic blood pressure, DBP = diastolic blood pressure, BMI=body mass index, FVC = forced vital capacity, PVR = pulmonary ventilation rate, WHR = waist hip ratio, QOL = quality of life, domain -level and overall judgements were classified according to the ROBINS-I guidance as 'Low', 'Moderate', 'Serious' risk of bias

DISCUSSION

The current integrative review considered nine studies, out of which the direct evidence of two studies (10,34) conducted on women employees, among which one was on private IT sector; indirect evidence included four studies, where three studies (21–23) on both sexes, one on university employees (21), one on healthcare workers (23), and one on the engineering profession (22), while the remaining one conducted on software employees where sex was not mentioned (3). Due to the availability of very limited evidence, three supportive studies (8,35,36) conducted exclusively on age-matched female non-working adults were also considered. Further, a number of studies with insufficient methodological information categorized as serious risk of bias evaluated by ROBINS-I were considered for the qualitative synthesis. Therefore, findings from studies with moderate or serious risk of bias were interpreted cautiously and were given less weight in the overall synthesis than

findings from studies with lower risk of bias. However, based on the reviewed literature, and considering the research question formulated for focusing the review process, the discussions mainly focused on three broad spectrums: Sun Salutation and its detailed procedure, which corresponds to research question (1); The effects of Sun Salutation practice on different domains of health and its implications for cognitive function and workplace productivity, that corresponds to questions (2) and (3), respectively.

Sun Salutation and Its Procedure with Breathing Technique

Sun Salutation is a popular sequence of yoga poses that combines movement, breath, and focus. It has roots in ancient Indian traditions where the sun was honoured as a source of life and energy. The Sun Salutation sequence comes from Hatha yoga, which is suitable for beginners, and its variations are also found in Ashtanga and Vinyasa yoga (which focuses on flow-based movements) (20,21). Today, it is practiced around the world as a form of exercise and meditation. The Sun Salutation comprises 12 postures, among which Ashtanga Namaskara (Eight-Limb Pose) and Bhujangasana (Cobra Pose) are performed once in the middle of a cycle, while Pranamasana, Hasta Utthanasana, Padahastasana, Ashwa Sanchalanasana and Parvatasana are repeated twice. Upon completion of performing all 12 postures, it is called one cycle. In its traditional form, each posture may also be accompanied by the chanting of a corresponding mantra dedicated to the sun, transforming the practice from a series of physical movements into an integrated mind–body discipline that combines movement, breath regulation, and mindful awareness (27). The current review was conducted on six studies on working adults, among which three studies including four intervention groups, were on corporate professionals (3,22,34) who underwent SS practice for 30 days to 12 weeks, lasting at least 25 to 30 minutes and experienced positive changes. But these studies varied in terms of sex distribution and sex-based results were not consistently reported. As such, their results can only be taken as indirect evidence for working women and cannot be directly applied to women. The other three supportive studies (8,35,36) on adult women performed at least two weeks of SS intervention, resulting in positive changes. So, the available supportive evidence suggests that SS practice for two weeks or longer may bring a promising impact on adult women.

Effects of Sun Salutation Practice on Different Domains of Health of Working Women

The demands of modern working life place women under tremendous physical and psychological strain. With increased work hours, high-stress environments, sedentary behaviours, and the pressure of balancing personal and professional roles, many working women face health challenges that compromise their overall well-being (3,37,38). Against this backdrop, adopting holistic and sustainable wellness practices becomes essential. Surya Namaskar (Sun Salutation), a classical yogic sequence that integrates asanas, breath control, and mindfulness, may offer a scientifically supported, accessible, and time-efficient practice suited to the needs of working women (34). This discussion explores the multifaceted benefits of Sun Salutation for working women with special emphasis on corporate settings, examining its relevance as a daily health behaviour.

Physical Health

The lifestyle followed by working women often involves excessive sitting and lack of physical activity, leading to musculoskeletal pain, poor posture, and reduced physical endurance (39,40). The practice of Sun Salutation comprises twelve rhythmic postures that stretch, strengthen and tone almost all large muscle groups in the body, which may contribute to the development of muscular strength, spine flexibility and joint mobility and counteract the adverse effects of sedentary behaviour (19,41–43). However, in the current review the direct evidence from occupational populations was limited, and outcomes regarding physical fitness were primarily supported by two age-matched studies conducted among healthy adult women. According to Jakhotia et al. (2015) (36), there were significant benefits (12.51%; $p<0.05$) regarding cardiorespiratory endurance, flexibility, and muscle endurance after the practice of SS for eight weeks; similarly, Shankar and Pancholi (2011) (35) found that the practice of SS two times per day for two weeks increased flexibility (43.12%; $p<0.01$) and endurance (46.26%; $p<0.01$). Based on supportive studies, the observed improvements may be associated with the nature of Sun Salutation exercises that require continuous stretching, moving, and muscle activity (18,44,45). However, because these mechanisms were not directly examined in the included studies, this explanation should be considered plausible rather than conclusive.

Physiological Health

In the current review, the included studies reported changes in several physiological outcomes, including cardiorespiratory function (VO_2 Max, FVC, PVR, RHR, SBP, DBP), body mass index, body composition, and waist-hip ratio following SS practice ranged from two weeks to twelve weeks. Out of six studies on working adults, two studies (10,34) including three intervention groups exclusively included working women and therefore provided direct evidence that considered physiological variables, whereas all three supportive studies (8,35,36) assessed the same. Out of the two studies, one study (34) including two intervention groups of SS (fast SS and slow SS) the corporate women showed enhanced FVC (fast SS group 73.86%, slow SS group 61.54%; $p<0.05$) along with the reduction in resting heart rate (fast SS group 5.29%, slow SS group 4.32%; $p<0.05$) and pulmonary ventilation rate (PVR) (fast SS group 25.62% and slow SS group 18.20%, $p<0.05$) following 30 to 40 minutes SS session, of 12 weeks duration while in the other study (10), five days per week of SS practice, brought promising changes (6.40%, $p<0.05$) in SBP among working women. In the context of SS, these adaptations may be due to the synchronized combination of dynamic postures and controlled breathing. Repeated thoracic expansion, diaphragmatic activation, and rhythmic respiration may contribute to improving respiratory muscle strength, chest wall mobility, lung compliance, and

alveolar ventilation (19,46). These changes increase FVC and optimize pulmonary ventilation, resulting in enhanced oxygen transport, improved ventilatory efficiency, reduced respiratory effort, and ultimately better cardiorespiratory health (4). Additionally, among three supportive studies on adult women, two studies (8,36) reported significant reductions in body mass index and waist-hip ratio. These changes in body composition may be attributed to 45 minutes of daily Sun Salutation practice performed in an aerobic manner, which contributes to increased caloric expenditure, metabolic activity, and fat oxidation. Thus, the practice can lead to reduced body fat percentage, BMI, and waist-to-hip ratio and improved metabolic health in female professionals (41,47). Further, the other study (35) showed a significant reduction in SBP (3.82%; $p<0.01$) and DBP (3.82%; $p<0.01$) following 15 minutes of SS for two sessions per day of two weeks duration. Given the heterogeneity of populations, intervention protocols, and outcome measures, these findings should be interpreted as indicating potential physiological benefits rather than definitive effects among working women. Furthermore, experimental research needs to be conducted on corporate women to create awareness of benefits and to restore the well-being of the employee.

Psychological and Emotional Well-being

Working women frequently experience psychological strain due to performance pressure, multitasking demands, and limited recovery time, which may lead to mental fatigue, anxiety, mood disturbances, and burnout (38). In the current review, SS practice demonstrates promising effects on psychological health, especially in reducing stress and anxiety levels and improving the quality of life (QoL). Out of six studies on working adults, four indirect evidence-based studies (3,21–23) specifically evaluated psychological health indicators, primarily professional stress, quality of life, stress and anxiety, among which a significant reduction in stress (8.30%; $p<0.0001$) was found among female healthcare workers aged 25 to 50 years following Sun Salutation practice for six months (23). In another study, an eight-week SS intervention comprising supervised 50-minute sessions, three times per week, led to a significant reduction in the levels of stress and anxiety (15.37%; $p<0.05$) among university employees (21). Additionally, a study conducted on corporate employees (3) reported a significant reduction in professional stress (34.87%; $p<0.05$) following a 30-day daily supervised SS session of 25- 30 minutes. Further, the impact of 8 weeks of SS practice showed a beneficial effect on the quality of life of corporate professionals of both sexes (Female n = 84) in the engineering sectors (22). The results are supported by the meditative and rhythmic aspects of Sun Salutation, where, through the coordination of body postures and breathing techniques, participants become more aware and emotionally stable. This can help reduce the stress response, improve cognitive performance, and emotional stability of individuals, thus enhancing their psychological well-being (43,48).

Workplace Wellness, Cognitive Function and its Implications for Productivity

In many corporate offices, women hold executive and managerial positions where they oversee the work of employees and are responsible for the overall growth of the company. In this context, introducing health promotion programs in the workplace may help women employees maintain their physical and mental well-being, while also contributing to improved cognitive functioning (49). From recent findings, one indirect evidence-based study found that an eight-week SS intervention comprising supervised 50-minute sessions three times per week led to a significant improvement in the domain of working memory in cognitive functioning (21). However, workplace productivity, job performance, or work efficiency was not directly measured in most of the studies included in the current analysis. Therefore, improved stress or cognitive functioning may have potential relevance to workplace functioning, but any association between Sun Salutation and productivity remains hypothetical and requires direct evaluation in appropriately designed workplace studies. Other scientific studies reveal that employees who engage in regular physical activity particularly the SS reported better concentration, reduced absenteeism, and greater workplace satisfaction (43,50). Chawla et al. 2022 conducted a study to observe the effects of SS on sleep quality and reported that SS promotes good sleep quality, energy management, and low mental tiredness (51), while in other study Kodidala et al. 2021 examined the effect of SS on cognitive ability and found significant improvement (46). These findings supports that the SS practice has the potential to provide benefits to better attention, decision-making skills, and memory processes; this exercise helps develop cognitive processes (48). Further, it is evident from the current review that the decreased stress levels and enhanced working memory might indirectly help in improving work-related productivity, but most included studies did not directly measure productivity. Therefore, conclusions regarding productivity remain speculative.

Limitation of the Study

There are multiple limitations associated with the current review that should be noted when considering the outcomes of the research. First, only nine relevant articles have been found, where two represent RCTs, thus providing a limited number of sources of high-quality evidence. Second, the majority of the selected studies were carried out in India and are geographically restricted in terms of generalizability of the obtained results to other populations. Third, the study populations were heterogeneous; comprising healthy adult women of different profession while the target population corporate women were markedly underrepresented, having just one article in their focus. Fourth, there were multiple shortcomings in terms of the intervention period and the number of participants involved, which did not allow evaluating the long-term efficiency of Sun Salutation. Additionally, there was heterogeneity in the nature of the interventions provided, especially in terms of the duration, frequency, intensity of sessions and their overall structure. Furthermore, variation in outcome measurement instruments and procedures used across studies may contribute to heterogeneity in the reported outcomes and limit direct comparison between studies. Finally, the review was limited by the English language, which may have introduced language and publication bias.

Such constraints have pointed out the need for conducting RCTs using large sample sizes of corporate women and standardized practices of the SS intervention with long intervention periods in order to provide robust and generalizable evidence.

Strength of the Study

Despite these limitations, the available evidence suggests that doing Sun Salutation can have some benefits for physical and mental well-being for adult women. While there is limited evidence on corporate women specifically, it appears that there is potential for making Sun Salutation a viable workplace wellness solution worth exploring further. Moreover, one of the major advantages of Sun Salutation is its simplicity and practicality for incorporation into the daily routine of busy professionals. It requires no equipment, may be practiced in small spaces, and can be adapted to individual fitness levels. With very limited evidence, the current review gives a detailed analysis of the study findings and discusses the possibilities of applying the Sun Salutation in health promotion programs in workplaces. Moreover, the present review is the rare integrative review that clearly explains the solutions to mitigate the research gap mentioned in the research questions.

Recommendation

The intervention protocols used in the included studies varied considerably in duration, frequency, session length, and practice characteristics. Therefore, the available evidence does not support prescribing a specific workplace dose of Sun Salutation for corporate women. These intervention protocols can still offer initial guidelines about the possible duration and frequency of practice that can be taken into account during future workplace intervention design. Future controlled studies among corporate women are required to determine an effective, acceptable, and sustainable dose of Sun Salutation for workplace health promotion.

CONCLUSION

Based on the findings of this integrative review, the practice of Sun Salutation has the potential to positively impact certain aspects of physiological and psychological well-being, along with the quality of life of working adult women. Nevertheless, there is still very negligible evidence about the effects on women in the corporate sector, as well as any benefits in terms of productivity in the corporate environment. However, one study involving university professionals reported improvements in executive functioning, particularly working memory. In addition, supportive evidence from studies involving healthy adult women indicates that SS may enhance health-related physical fitness, including cardiorespiratory fitness, flexibility, body composition, and muscular endurance. Furthermore, the methodological limitations and heterogeneity across the included studies, including variations in participant characteristics, intervention protocols, outcome measures, and study quality, limit the strength of the current evidence. Therefore, while SS may be considered a promising, low-cost, and accessible intervention for promoting the overall health and well-being of working adult women, particularly those employed in corporate settings, the current evidence is insufficient to draw definitive conclusions. Future high-quality controlled studies using standardized Sun Salutation protocols and including corporate women are needed to confirm these findings and establish evidence-based recommendations.

DECLARATIONS

Author contributions: Author 1 contributed to the study design, finalised study inclusion, evaluated study quality, analysed data, manuscript preparation and approved the final version. Author 2 and Author 3 reviewed the relevant literature, collected and analysed data, and prepared the manuscript. All authors have read and approved the final version of the manuscript and agree to be accountable for all aspects of the work.

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REFERENCES

1. Fernandez C, Puri H. A Statistical Portrait of the Indian Female Labor Force [Internet]. Asian Development Bank Institute; 2023 Dec [cited 2025 May 28]. Available from: https://www.adb.org/publications/a-statistical-portrait-of-the-indian-female-labor-force doi:https://doi.org/10.56506/BDXR3681
2. Hartfiel N, Burton C, Rycroft-Malone J, Clarke G, Havenhand J, Khalsa SB, et al. Yoga for reducing perceived stress and back pain at work. Occup Med. 2012 Dec 1;62(8):606–12. doi:https://doi.org/10.1093/occmed/kqs168
3. Varsha S. Effect of Suryanamaskar on Occupational Stress among it Professionals. J Adv Med. 2020 Mar 20;9(1):01–4. doi:https://doi.org/10.30954/2277-9744.1.2020.1
4. Hwang WJ, Kim JA, Ha JS. Effects of a Yoga Program in Reducing Cardiovascular Disease Risk Factors in Workers of Small Workplaces: A Pilot Test. Sustainability. 2020 Jan;12(23):1–14. doi:https://doi.org/10.3390/su122310038

5. Noprianty R, Fadhlurrohman A, Munawaroh M, Wahyudi FM. Work and Individual Factors Influencing Stress Among Nurse Anesthetists in West Java, Indonesia. J Public Health Pharm. 2025 Oct 2;5(3):558–67. doi:https://doi.org/10.56338/jphp.v5i3.6590
6. Paramashiva PS, K A, K V, K.n. S, Chandrasekaran B, Reddy GG, et al. Impact of a six-month yoga intervention on cognitive performance among desk-based workers: An interrupted time-series design. Adv Integr Med. 2024 Dec 11. doi:https://doi.org/10.1016/j.aimed.2024.12.001
7. Sheetal. Corporate Yoga: An Empirical Study to Overcome the Problem of Chronic Back-painamong Employees of IT Sector. Int J Res Eng Appl Manag. 2020 May 30;06(02):213–6. doi:https://doi.org/10.35291/2454-9150.2020.0393
8. Babar R, Kumar Ps V, Au S. Effect of Suryanamaskar on Anthropometric Variable Among Middle Age Housewife. Paripex Indian J Res. 2022 Jun 15;11(6):115–8. doi:https://doi.org/10.36106/paripex/5708205
9. Bandyopadhyay N, Das T, Biswas A, Mondal D. Effect of Mindfulness-Based Stress Reduction Program on Mental Health of Non-Clinical Older Adults: A Systematic Review on Randomized Controlled Trials. Int J Aging Healh Mov. 2023 Apr 20;05(2):16–23.
10. Muruguvalavan V, Jayanthi V. Effect of suryanamaskar on body mass index, systolic and diastolic blood pressure among obese working women. Int J Yogic Hum Mov Sports Sci. 2019;4(1):976–7.
11. Diana. Competence of Public Health Center Health Extension Officers in the Tual City Health Service Work Area. J Public Health Pharm. 2023 Jul 15;3(2):29–35. doi:https://doi.org/10.56338/jphp.v3i2.4246
12. Foncubierta-Rodríguez MJ, Poza-Méndez M, Holgado-Herrero M. Workplace health promotion programs: The role of compliance with workers' expectations, the reputation and the productivity of the company. J Safety Res. 2024 Jun;89:56–63. doi:https://doi.org/10.1016/j.jsr.2024.02.008
13. Bandyopadhyay N, Das T, Biswas A, Koley A. Effects of Yogic Intervention on Sleep Quality of Healthy Elderly: A Systematic Review. Univers J Public Health. 2023 Feb;11(1):78–88. doi:https://doi.org/10.13189/ujph.2023.110109
14. Bojsen-Møller E, Boraxbekk CJ, Ekblom Ö, Blom V, Ekblom MM. Relationships between Physical Activity, Sedentary Behaviour and Cognitive Functions in Office Workers. Int J Environ Res Public Health. 2019 Nov 27;16(23):1–15. doi:https://doi.org/10.3390/ijerph16234721
15. Mondal D, Mondal S, Biswas A, Koley A, Bandyopadhyay N. Practice of yogic postures and breathing: A holistic approach towards a healthy life for women. Int J Phys Educ Sports Health. 2026;13(4):168–74. doi:https://doi.org/10.22271/kheljournal.2026.v13.i4b.4414
16. Sengupta P. Health Impacts of Yoga and Pranayama: A State-of-the-Art Review. Int J Prev Med. 2012 Jul;3(7):444–58. PubMed PMID: 22891145; PubMed Central PMCID: PMC3415184.
17. Bandyopadhyay N, Das T, Mondal S. Practicing Surya Namaskar: A Sequence of Yogic Postures for Overall Health and Wellness among Healthy Adults. Phys Educ Theory Methodol. 2025 Mar 30;25(2):416–25. doi:https://doi.org/10.17309/tmfv.2025.2.24
18. Dubey S, Choudhary PK. Analyzing the Musculoskeletal Flexibility in Young Females: The Impact of a Six-Week Surya Namaskar Intervention on Back Flexibility and Lumbar Flexion. Phys Educ Theory Methodol. 2024 Aug 30;24(4):554–61. doi:https://doi.org/10.17309/tmfv.2024.4.06
19. Suwannakul B, Sangkarit N, Thammachai A, Tapanya W. Effects of Surya Namaskar yoga on perceived stress, anthropometric parameters, and physical fitness in overweight and obese female university students: A randomized controlled trial. Hong Kong Physiother J. 2024 Apr 27;45(1):23–33. doi:https://doi.org/10.1142/S1013702525500027
20. Sushitha S, Ashwitha K. The Impact of Surya Namaskar on Human Health Factors—An Empirical Bivariate Analysis. In: Joshi A, Mahmud M, Ragel RG, Kartik S, editors. ICT: Applications and Social Interfaces. Singapore: Springer Nature; 2024. p. 43–51. doi:https://doi.org/10.1007/978-981-97-0210-7_4
21. Phansikar M, Gothe N, Hernandez R, Lara-Cinisomo S, Mullen SP. Feasibility and impact of a remote moderate-intensity yoga intervention on stress and executive functioning in working adults: a randomized controlled trial. J Behav Med. 2023 Oct;46(5):720–31. doi:https://doi.org/10.1007/s10865-022-00385-4
22. Sagar S, Rastogi R, Gupta B. Impact of Surya Namaskar Yog on QoL of Employees: An Empirical Study Following Industry 5.0 Standards. In: Lightweight Digital Trust Architectures in the Internet of Medical Things (IoMT) [Internet]. IGI Global; 2024. p. 325–47. Available from: https://books.google.co.in/books?hl=en&lr=&id=-7gIEQAAQBAJ&oi=fnd&pg=PA325&dq=info:xXp2Y98QM1EJ:scholar.google.com/&ots=9B_Ipb82iR&sig=oVf8Z32qSHyejDNplzrp5nQFFbE&redir_esc=y#v=onepage&q&f=false doi:https://doi.org/10.4018/979-8-3693-2109-6.ch018
23. Patel N, Vandra J, Chauhan AK. Effects of sun-salutation to reduce stress and anxiety problems in health care workers due to work load-an experimental study. Int J Sci Res. 2024 Aug;13(08):6–8. doi:https://doi.org/10.36106/ijsr
24. Bussing A, Michalsen A, Khalsa SBS, Telles S, Sherman KJ. Effects of Yoga on Mental and Physical Health: A Short Summary of Reviews. Evid Based Complement Alternat Med. 2012;2012(1):165410. doi:https://doi.org/10.1155/2012/165410
25. Stec K, Kruszewski M, Ciechanowski L. Effects of Suryanamaskar, an Intensive Yoga Exercise Routine, on the Stress Levels and Emotional Intelligence of Indian Students. Int J Environ Res Public Health. 2023 Jan;20(4):4. doi:https://doi.org/10.3390/ijerph20042845
26. Chang HC, Cheng YC, Yang CH, Tzeng YL, Chen CH. Effects of Yoga for Coping with Premenstrual Symptoms in Taiwan—A Cluster Randomized Study. Healthcare. 2023 Apr 21;11(8):1193. doi:https://doi.org/10.3390/healthcare11081193
27. Tripathi R, Dwivedi AK. Surya Namaskar: A Natural Therapy for Mind-Body Balance. J Neonatal Surg. 2025 Feb 12;14(4S):962–9. doi:https://doi.org/10.52783/jns.v14.1902
28. Nolfi D. LibGuides: Integrative Review: Framework [Internet]. [cited 2025 Aug 12]. Available from: https://guides.library.duq.edu/c.php?g=1055475&p=7725762
29. Whittemore R, Knafl K. The integrative review: updated methodology. J Adv Nurs. 2005 Dec;52(5):546–53. doi:https://doi.org/10.1111/j.1365-2648.2005.03621.x
30. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021 Mar 29;372:n71. doi:https://doi.org/10.1136/bmj.n71 PubMed PMID: 33782057.
31. CASP - Critical Appraisal Skills Programme [Internet]. [cited 2025 Aug 12]. CASP Checklists - Critical Appraisal Skills Programme. Available from: https://casp-uk.net/casp-tools-checklists/
32. Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al. Cochrane Handbook for Systematic Reviews of Interventions. John Wiley & Sons; 2019. 739 p.
33. Sterne JAC, Savović J, Page MJ, Elbers RG, Blencowe NS, Boutron I, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. BMJ. 2019 Aug 28;366:l4898. doi:https://doi.org/10.1136/bmj.l4898 PubMed PMID: 31462531.

34. Jayachitra M. Analysis of Physiological Changes Through Dynamic Asanas and Varied Surya Namaskar Among Working Women. Int J Curr Adv Res. 2017;6(10):7025–8. doi:http://dx.doi.org/10.24327/ijcar.2017.7028.1065
35. Shankar G, Pancholi B. The Effect of Suryanamaskar Yoga Practice on the Heart Rate, Blood Pressure, Flexibility and Upper Body Muscle Endurance in Healthy Adult. Int J Health Sci Res. 2011 Oct;1(1):33–9.
36. Shimpi A, Shyam A, Sancheti P, Jakhotia K, Rairikar S, Mhendale P, et al. Suryanamaskar: An equivalent approach towards management of physical fitness in obese females. Int J Yoga. 2015;8(1):27. doi:https://doi.org/10.4103/0973-6131.146053
37. Babar R, Panchal D. Effect of surya namaskar practice on sleep quality among obese working in the it sector. VIDYA - J GUJARAT Univ. 2025 Dec 1;4(2):601–5. doi:https://doi.org/10.47413/kmem3p21
38. Valencia L, Weber A, Spegel H, Bögle R, Selmani A, Heinze S, et al. Yoga in the workplace and health outcomes: a systematic review. Occup Med Oxf Engl. 2019 May 25;69:195–203. doi:https://doi.org/10.1093/occmed/kqz033
39. Mohammed M, Naji FL. Benefits of Exercise Training For Computer-Based Staff: A Meta Analyses. Int J Kinesiol Sports Sci. 2017 Apr 30;5(2):16–23. doi:https://doi.org/10.7575/aiac.ijkss.v.5n.2p.16
40. Sihawong R, Janwantanakul P, Jiamjarasrangsi W. A prospective, cluster-randomized controlled trial of exercise program to prevent low back pain in office workers. Eur Spine J. 2014 Apr 1;23(4):786–93. doi:https://doi.org/10.1007/s00586-014-3212-3
41. Bhavanani A, Udupa K, Madanmohan, Ravindra P. A comparative study of slow and fast suryanamaskar on physiological function. Int J Yoga. 2011;4(2):71. doi:https://doi.org/10.4103/0973-6131.85489
42. Bhutkar MV, Bhutkar PM, Taware GB, Surdi AD. How Effective Is Sun Salutation in Improving Muscle Strength, General Body Endurance and Body Composition? Asian J Sports Med. 2011 Dec;2(4):259–66. doi:https://doi.org/10.5812/asjsm.34742 PubMed PMID: 22375247; PubMed Central PMCID: PMC3289222.
43. Venkatesh LP, Vandhana S. Insights on Surya namaskar from its origin to application towards health. J Ayurveda Integr Med. 2022 Jun;13(2):1–9. doi:https://doi.org/10.1016/j.jaim.2021.10.002 PubMed PMID: 34974957.
44. Das DP. Suryanamaskara is an Effective Practice for Overall Health Management: A Preliminary Review Study. Int J Soc Sci Hum Res. 2023 Jan 30;06(01):707–14. doi:https://doi.org/10.47191/ijsshr/v6-i1-94
45. Mangaonkar A, Puntambekar A. Effect of suryanamaskar vs dynamic stretching on hamstring flexibility among physiotherapy students: a pilot study. Int J Physiother. 2018 Dec 26;5(6):202–6. doi:https://doi.org/10.15621/ijphy/2018/v5i6/178058
46. Kodidala SR, Hans PSR, Sorout J, Soni H. Impact of Suryanamaskar Training on Cardiovascular, Respiratory, and Cognitive Functions among Medical Students. Avicenna J Neuro Psycho Physiol. 2021 Jun 4;9(1):1–4. doi:https://doi.org/10.32592/ajnpp.2022.9.1.100
47. Pal R, Rao S, Deo G, Basavaraddi IV, Sharma N, Madaan L. Impacts of the Surya Namaskar on Body Composition and Physiological Parameters among Yoga and Non Yoga Professionals: A Quasi-experimental Study. J Clin Diagn Res. 2024 Feb;18(2):11–5. doi:https://doi.org/10.7860/JCDR/2024/66733.19043
48. Parajuli N, Shindhe M, Pradhan B. Effect of Surya Namaskara (Sun Salutation) on mental health, self-control and mindfulness of adolescent school children. Complement Ther Clin Pract. 2023 Feb 1;50:101691. doi:https://doi.org/10.1016/j.ctcp.2022.101691
49. Gothe N, Pontifex MB, Hillman C, McAuley E. The Acute Effects of Yoga on Executive Function. J Phys Act Health. 2013 May;10(4):488–95. doi:https://doi.org/10.1123/jpah.10.4.488
50. Uppal R, Kaur S, Gupta G. To Analyse the Effect of Surya Namaskar on Cognitive Function and Quality of Life among Older Population. J Appl Conscious Stud. 2025 Jan;13(1):49–54. doi:https://doi.org/10.4103/jacs.jacs_179_24
51. Chawla JK, Arya T, Sharma R, Kumar P. Effect of Suryanamaskar on the Sleep Quality and General Well-being among Young Adults: A Quasi-experimental Study. J Clin Diagn Res. 2022;16(10):YC06–9. doi:https://doi.org/10.7860/JCDR/2022/57340.17094

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