

# ***RESEARCH AT A GLANCE***



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# *Research at a Glance*

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# **PREFACE**

## **Introduction**

The library of the Central Council for Research in Homoeopathy has been circulating "Research at a Glance". The main objective is to disseminate precise information/citation about scientific articles published in various journals/magazine other than the journals subscribed by this Council.

## **Scope**

This volume covers articles on Homeopathy, Ayurveda, Unani, Yoga.

## **Arrangement of Entries**

The articles are indexed under the name of the authors, arranged in alphabetical order. The entries have been made in the following order:

Author  
Title  
Name of Journal  
year of publication; Volume (issue no.): pagination  
Abstract

## **Acknowledgement**

We are grateful to Dr. Subhash Kaushik, Director General, CCRH for his encouragement and valuable suggestions from time to time. We sincerely acknowledge the cooperation of Mrs. Nisha Adhikari, DEO in compiling this bulletin.

**(Dr. O.P. Verma)**  
**Librarian**

# HOMOEOPATHY

**Di Meglio A, Charles C, Martin E, Havas J, Gbenou A, Flaysakier JD et al. Uptake of Recommendations for Posttreatment Cancer-Related Fatigue Among Breast Cancer Survivors. J Natl Compr Canc Netw. 2022 Feb 7:1-13. doi: 10.6004/jnccn.2021.7051. Online ahead of print. PMID: 35130491**

## **Abstract:**

**Background:** Physical activity (PA) and psychosocial interventions are recommended management strategies for cancer-related fatigue (CRF). Randomized trials support the use of mind-body techniques, whereas no data show benefit for homeopathy or naturopathy.

**Methods:** We used data from CANTO (ClinicalTrials.gov identifier: NCT01993498), a multicenter, prospective study of stage I-III breast cancer (BC). CRF, evaluated after primary treatment completion using the EORTC QLQ-C30 (global CRF) and QLQ-FA12 (physical, emotional, and cognitive dimensions), served as the independent variable (severe [score of  $\geq 40/100$ ] vs nonsevere). Outcomes of interest were adherence to PA recommendations ( $\geq 10$  metabolic equivalent of task [MET] h/week [GPAQ-16]) and participation in consultations with a psychologist, psychiatrist, acupuncturist, or other complementary and alternative medicine (CAM) practitioner (homeopath and/or naturopath) after CRF assessment. Multivariable logistic regression examined associations between CRF and outcomes, adjusting for sociodemographic, psychologic, tumor, and treatment characteristics.

**Results:** Among 7,902 women diagnosed from 2012 through 2017, 36.4% reported severe global CRF, and 35.8%, 22.6%, and 14.1% reported severe physical, emotional, and cognitive CRF, respectively. Patients reporting severe global CRF were less likely to adhere to PA recommendations (60.4% vs 66.7%; adjusted odds ratio [aOR], 0.82; 95% CI, 0.71-0.94;  $P=.004$ ), and slightly more likely to see a psychologist (13.8% vs 7.5%; aOR, 1.29; 95% CI, 1.05-1.58;  $P=.014$ ), psychiatrist (10.4% vs 5.0%; aOR, 1.39; 95% CI, 1.10-1.76;  $P=.0064$ ), acupuncturist (9.8% vs 6.5%; aOR, 1.46; 95% CI, 1.17-1.82;  $P=.0008$ ), or CAM practitioner (12.5% vs 8.2%; aOR, 1.49; 95% CI, 1.23-1.82;  $P<.0001$ ). There were differences in recommendation uptake by CRF dimension, including that severe physical CRF was associated with lower adherence to PA (aOR, 0.74; 95% CI, 0.63-0.86;  $P=.0001$ ) and severe emotional CRF was associated with higher likelihood of psychologic consultations (aOR, 1.37; 95% CI, 1.06-1.79;  $P=.017$ ).

**Conclusions:** Uptake of recommendations to improve CRF, including adequate PA and use of psychosocial services, seemed suboptimal among patients with early-stage BC, whereas there was a nonnegligible interest in homeopathy and

naturopathy. Findings of this large study indicate the need to implement recommendations for managing CRF in clinical practice.

**Luu NN, Soldatova L, Friedman O. Role of Complementary and Alternative Medicine in Facial Plastic Surgery. *Facial Plast Surg.* 2022 Feb;38(1):88-93. doi: 10.1055/s-0041-1736582. Epub 2021 Nov 8. PMID: 34749403**

**Abstract:**

Complementary and alternative medicine (CAM) has become increasingly popular among facial plastic surgery patients. Over the last few decades, there has been a surge in the use of CAM. Despite the increasing prevalence of CAM, patients may feel uncomfortable discussing these therapies with their physicians, and physicians feel under-equipped to engage in meaningful discussions regarding these nontraditional therapies. This article reviews recent literature on the use of CAM for skin treatment in an attempt to provide additional resource. To date, the evidence to support statistically significant symptom improvement with use of non-traditional therapies remains limited. While preliminary data supports essential oil therapy in some cases, the results of the studies investigating other CAM therapies (traditional Chinese medicine, Ayurveda, and homeopathy) have been mixed and inconclusive.

**Morrissey AM, O'Neill A, O'Sullivan K, Robinson K. Complementary and alternative medicine use among older adults with musculoskeletal pain: findings from the European Social Survey (2014) special module on the social determinants of health. *Br J Pain.* 2022 Feb;16(1):109-118. doi: 10.1177/20494637211023293. Epub 2021 Jun 13. PMID: 35111319**

**Abstract:**

**Background:** This study describes the use of complementary and alternative medicine (CAM) among older adults who report being hampered in daily activities due to musculoskeletal pain. The characteristics of older adults with debilitating musculoskeletal pain who report CAM use is also examined.

**Methods:** Cross-sectional European Social Survey Round 7 data from 21 countries were examined for participants aged 55 years and older, who reported musculoskeletal pain that hampered daily activities in the past 12 months.

**Results:** Of the 4950 older adult participants reporting musculoskeletal pain that hampered daily activities, the majority (63.5%) were from the West of Europe, reported secondary education or less (78.2%), and reported at least one other health-related problem (74.6%). In total, 1657 (33.5%) reported using at least one CAM treatment in the previous year. Manual body-based therapies (MBBTs) were most used, including massage therapy (17.9%) and osteopathy (7.0%). Alternative medicinal systems (AMSs) were also popular with 6.5% using homoeopathy and 5.3% reporting herbal treatments. A general trend of higher CAM use in younger participants was noted. CAM use was associated

with physiotherapy use, female gender, higher levels of education, being in employment and living in West Europe. Those reporting multiple health problems were more likely to use all CAM treatments, except MBBT.

**Conclusion:** A third of older Europeans with musculoskeletal pain report CAM use in the previous 12 months. Certain subgroups with higher rates of CAM use could be identified. Clinicians should comprehensively and routinely assess CAM use among older adults with musculoskeletal pain.

**Stanossek I, Wehrend A. Application of veterinary naturopathy and complementary medicine in small animal medicine-A survey among German veterinary practitioners. PLoS One. 2022 Feb 28;17(2):e0264022. doi: 10.1371/journal.pone.0264022. eCollection 2022. PMID: 35226679**

**Abstract:**

**Background:** The international use of and interest in veterinary naturopathy and complementary medicine are increasing. There are diverse modes of treatment, and owners seem to be well informed. However, there is a lack of data that describes the state of naturopathic or complementary veterinary medicine in Germany. This study aims to address the issue by mapping the currently used treatment modalities, indications, existing qualifications, and information pathways. In order to map the ongoing controversy, this study records the advantages and disadvantages of these medicines as experienced by veterinarians. Demographic influences are investigated to describe distributional impacts on using veterinary naturopathy and complementary medicine.

**Methods:** A standardised questionnaire was used for the cross-sectional survey. It was distributed throughout Germany in a written and digital format from September 2016 to January 2018. Because of the open nature of data collection, the return rate of questionnaires could not be calculated. To establish a feasible timeframe, active data collection stopped when the previously calculated limit of 1061 questionnaires was reached. With the included incoming questionnaires of that day a total of 1087 questionnaires were collected. Completely blank questionnaires and those where participants did not meet the inclusion criteria (were not included, leaving 870 out of 1087 questionnaires to be evaluated. A literature review and the first test run of the questionnaire identified the following treatment modalities: homoeopathy, phytotherapy, traditional Chinese medicine (TCM), biophysical treatments, manual treatments, Bach Flower Remedies, neural therapy, homotoxicology, organotherapy, and hirudotherapy which were included in the questionnaire. Categorical items were processed using descriptive statistics in absolute and relative numbers based on the population of completed answers provided for each item. Multiple choices were possible. Metric data were not normally distributed (Shapiro Wilk Test); hence the median, minimum, and maximum were used for description. The impact of demographic data on the implementation of veterinary naturopathy and complementary techniques was

calculated using the Mann-Whitney-U-Test for metric data and the exact Fisher-Test for categorical data.

**Results:** Overall 85.4% (n = 679 of total 795 non-blank data sets) of all the questionnaire participants used naturopathy and complementary medicine. The treatments most commonly used were complex homoeopathy (70.4%, n = 478), phytotherapy (60.2%, n = 409), classic homoeopathy (44.3%, n = 301) and biophysical treatments (40.1%, n = 272). The most common indications were orthopedic (n = 1798), geriatric (n = 1428) and metabolic diseases (n = 1124). Over the last five years, owner demand for naturopathy and complementary treatments was rated as growing by 57.9% of respondents (n = 457 of total 789). Veterinarians most commonly used scientific journals and publications as sources for information about naturopathic and complementary contents (60.8%, n = 479 of total 788). These were followed by advanced training acknowledged by the ATF (Academy for Veterinary Continuing Education, an organisation that certifies independent veterinary continuing education in Germany) (48.6%, n = 383). The current information about naturopathy and complementary medicine was rated as adequate or nearly adequate by a plurality (39.5%, n = 308) of the respondents of this question. Further, 27.7% (n = 216) of participants chose the option that they were not confident to answer this question and 91 answers were left blank. The most commonly named advantages in using veterinary naturopathy and complementary medicine were the expansion of treatment modalities (73.5%, n = 566 of total 770), customer satisfaction (70.8%, n = 545) and lower side effects (63.2%, n = 487). The ambiguity of studies, as well as the unclear evidence of mode of action and effectiveness (62.1%, n = 483) and high expectations of owners (50.5%, n = 393) were the disadvantages mentioned most frequently. Classic homoeopathy, in particular, has been named in this context (78.4%, n = 333 of total 425). Age, gender, and type of employment showed a statistically significant impact on the use of naturopathy and complementary medicine by veterinarians ( $p < 0.001$ ). The university of final graduation showed a weaker but still statistically significant impact ( $p = 0.027$ ). Users of veterinary naturopathy and complementary medicine tended to be older, female, self-employed and a higher percentage of them completed their studies at the University of Berlin. The working environment (rural or urban space) showed no statistical impact on the veterinary naturopathy or complementary medicine profession.

**Conclusion:** This is the first study to provide German data on the actual use of naturopathy and complementary medicine in small animal science. Despite a potential bias due to voluntary participation, it shows a large number of applications for various indications. Homoeopathy was mentioned most frequently as the treatment option with the most potential disadvantages. However, it is also the most frequently used treatment option in this study. The presented study, despite its restrictions, supports the need for a discussion about evidence, official regulations, and the need for acknowledged qualifications because of the widespread application of veterinary naturopathy and complementary medicine. More data regarding the effectiveness and the

mode of action is needed to enable veterinarians to provide evidence-based advice to pet owners.



## AYURVEDA

**Alotaibi SS, Darwish H, Zaynab M, Alharthi S, Alghamdi A, Al-Barty A et al. Isolation, Identification, and Biocontrol Potential of Entomopathogenic Nematodes and Associated Bacteria against *Virachola livia* (Lepidoptera: Lycaenidae) and *Ectomyelois ceratoniae* (Lepidoptera: Pyralidae). *Biology (Basel)*. 2022 Feb 11;11(2):295. doi: 10.3390/biology11020295. PMID: 35205161**

### **Abstract:**

*Virachola livia* (Lepidoptera: Lycaenidae) and *Ectomyelois ceratoniae* (Lepidoptera: Pyralidae) are the key pests of pomegranates in Saudi Arabia that are managed mainly using broad-spectrum pesticides. Interactions between the entomopathogenic nematodes (EPNs) Steinernematids, and Heterorhabditids, and their entomopathogenic bacterial symbionts (EPBs) have long been considered monoxenic 2-partner associations responsible for killing insects and, therefore, are widely used in insect pest biocontrol. However, there are limited reports identifying such organisms in Taif, Saudi Arabia. The current study aimed to identify the EPNs and their associated bacteria isolated from Taif, Saudi Arabia, and evaluate their biocontrol potential on third instar larvae of *V. livia* and *E. ceratoniae* under laboratory conditions. A total of 35 EPN isolates belonging to *Steinernema* (20) and *Heterorhabditis* (15) were recovered from 320 soil samples. Twenty-six isolates of symbiotic or associated bacteria were isolated from EPNs and molecularly identified as *Xenorhabdus* (6 isolates), *Photorhabdus* (4 isolates), *Pseudomonas* (7), or *Stenotrophomonas* (9). A pathogenicity assay revealed that *Steinernema* spp. were more virulent than *Heterorhabditis* spp. against the two pomegranate insects, with LC<sub>50</sub> values of 18.5 and 13.6 infective juveniles (IJs)/larva of *V. livia* for *Steinernema* spp. and 52 and 32.4 IJs/larva of *V. livia* for *Heterorhabditis* spp. at 48 and 72 h post-treatment, respectively. Moreover, LC<sub>50</sub> values of 9 and 6.6 IJs/larva (*Steinernema* spp.) and 34.4 and 26.6 IJs/larva (*Heterorhabditis* spp.) were recorded for *E. ceratoniae* larvae at 48 and 72 h post-treatment. In addition, the EPB *Stenotrophomonas maltophilia* CQ1, isolated from *Steinernema* spp., surpassed *Pseudomonas mosselii* SJ10, associated with *Heterorhabditis* spp., in their ability to kill *V. livia* or *E. ceratoniae* larvae within 6 h post-application, resulting in 100% mortality in both insects after 24 and 48 h of exposure. We conclude that either application of EPNs' IJs or their associated EPBs could serve as potential biocontrol agents for *V. livia* and *E. ceratoniae*.

**Anand U, Tudu CK, S Nandy, K Sunita, V Tripathi, Loake GJ et al. Ethnodermatological use of medicinal plants in India: From ayurvedic formulations to clinical perspectives: A review. *J Ethnopharmacol*. 2022 Feb 10;284:114744. doi: 10.1016/j.jep.2021.114744. Epub 2021 Oct 14. PMID: 34656666**

## **Abstract:**

**Ethnopharmacological relevance:** Traditional knowledge is a particular form of practice or skill set that was developed in ancient times and was sustained through generations via the passing of knowledge, essentially confined within a specific tribe, local people, or family lineages. Ethnodermatological use of medicinal plants in India is still a subject to conduct more studies to see if there is chemical, microbiological, and/or clinical evidence, from a scientific perspective, of their effectiveness for those skin disorders. Thus, this review can be the basis for further studies and may provide targets for drug development.

**Aim of the study:** We compile and emphasize the most important part of ethnodermatology, namely, traditional knowledge of medicinal plants and their applications for several skin diseases in India. We also include a brief review and explanation on dermatology in Ayurvedic and Unani medicine. We review the pharmacological activity of extracts derived from some of the most cited plants against problem skin diseases as well.

**Materials and methods:** Different kinds of key phrases such as "Indian traditional ethnodermatology", "ethnodermatology", "ethnobotany", "skin diseases", "Ayurveda dermatology", "pharmacological activity" were searched in online search servers/databases such as Google Scholar (<https://scholar.google.com/>), ResearchGate (<https://www.researchgate.net/>), PubMed (<https://pubmed.ncbi.nlm.nih.gov/>), NISCAIR Online Periodicals Repository (NOPR) (<http://nopr.niscair.res.in/>). Based upon the analyses of data obtained from 178 articles, we formulated several important findings which are a summary shown in Tables. A total of 119 records of plants' uses have been found across India against 39 skin diseases. These are depicted with their localities of report, parts used, and preparation and administration methods against particular skin diseases.

**Results:** The knowledge and utilisation of herbal medicine in the Indian subcontinent has great potential to treat different kinds of human skin disorders. The administration of extracts from most of the plant species used is topical and few only are administrated orally. We also investigated the pharmacological activity of the extracts of the most cited plants against mice, bacterial and fungal pathogens, and human cells.

**Conclusions:** Complementary therapy for dermatological problems and treatment remains the main option for millions of people in the Indian subcontinent. This review on the practices of ethnobotanical dermatology in India confirms the belief that their analysis will accelerate the discovery of new, effective therapeutic agents for skin diseases. However, more studies and clinical evidence are still required to determine if the identified species may contribute to skin condition treatment, particularly in atopic eczema. Today, ethnodermatology is a well-accepted international discipline and many new practices have been initiated in numerous countries. We hope this article will

further accelerate the development of this area to identify a new generation of natural human skin treatments that will help meet the growing consumer demand for safe, sustainable, and natural treatments. In this context, research on plants utilised in ethnodermatology in India and elsewhere should be intensified.

**Balkrishna A, Sinha S, Varshney A. 28-day repeated dose toxicological evaluation of Coronil in Sprague Dawley rats: Behavioral, hematological, biochemical and histopathological assessments under GLP compliance. Drug Chem Toxicol. 2022 Feb 9:1-14. doi: 10.1080/01480545.2022.2036183. Online ahead of print. PMID: 35139698**

**Abstract:**

Ayurvedic medicines are widely employed globally for prophylaxis and treatment of a variety of diseases. Coronil is a tri-herbal medicine, constituted with the traditional herbs, *Tinospora cordifolia*, *Withania somnifera* and *Ocimum sanctum*, with known immunomodulatory activities. Based on its proven *in-vitro* activity and *in-vivo* efficacy, Coronil has been approved as a 'Supporting Measure for COVID-19' by the Ministry of AYUSH, Government of India. The current study was aimed to assess the non-clinical safety of Coronil in a 28-day repeated dose toxicity study along with a 14-day recovery period in Sprague Dawley rats. This toxicity study was conducted in accordance with OECD test guideline 407, under GLP-compliance. Specific-Pathogen-Free animals of either sex, housed in Individually-Ventilated-Cages were particularly used in the study. The tested Coronil dose levels were 0, 100, 300 and 1000 mg/kg/day, orally administered to 5 males and 5 female rats per test group. In the current study, no mortality was observed in any group and in addition, Coronil did not elicit any finding of toxicological relevance with respect to clinical signs, ocular effects, hematology, urinalysis and clinical chemistry parameters, as well as macro- or microscopical changes in any organs, when compared to the control group. Accordingly, the No-Observed-Adverse-Effect-Level (NOAEL) of Coronil was ascertained to be 1000 mg/kg/day, subsequent to its 28-day oral administration to male and female rats. The acceptable safety profile of Coronil paves the way further toxicity assessments in rodents for a longer duration as well as in higher animals, and towards its clinical investigation.

**Balkrishna A, Tomer M, Joshi M, Gujral S, Kumar Mishra R, Srivastava J et al. Standardization and validation of phytometabolites by UHPLC and high-performance thin layer chromatography for rapid quality assessment of ancient ayurvedic medicine, Mahayograj Guggul. J Sep Sci. 2022 Feb 13. doi: 10.1002/jssc.202100935. Online ahead of print. PMID: 35152549**

**Abstract:**

Mahayograj Guggul is an ancient ayurvedic medicine, prescribed for various joint disorders like arthritis, gout, and rheumatism. The present research was envisaged to develop a simple, sensitive, and comprehensive analytical method for standardization of Mahayograj Guggul. The analysis was conducted for gallic acid, protocatechuic acid, vanillic acid, cinnamic acid, piperine, guggulsterone-E, and guggulsterone-Z by high-performance thin-layer chromatography, and additionally ferulic acid, ellagic acid, and picroside I by ultra high-performance liquid chromatography. These developed methods were validated as per international guidelines, and were found linear ( $r^2 > 0.99$ ), sensitive, precise (relative standard deviation  $< 5\%$ ), and accurate with recovery values (85-105%). The limit of detection and quantification were in the range of 0.11-23.6 and 0.33-71.51  $\mu\text{g/g}$ . Gas chromatography tandem mass spectrometry was used to develop Mahayograj Guggul fingerprinting profile and to identify mid-polar or nonpolar compounds. Proximate analysis was used to ascertain the functional groups present in Mahayograj Guggul. Ultra high-performance liquid chromatography and gas chromatography tandem mass spectrometry were further employed to authenticate quality reproducibility in the active ingredients of Mahayograj Guggul in six commercial batches. Taken together, these analytical methods provide a scientific basis and reference for quality control evaluation of Mahayograj Guggul and similar traditional broad-spectrum formulations.

**Bhavaniramy S, Sibiya A, Alothaim AS, Al Othaim A, Ramar V, Veluchamy A et al. Evaluating the structural and immune mechanism of Interleukin-6 for the investigation of Goat Milk peptides as potential treatments for COVID-19. J King Saud Univ Sci. 2022 Feb 25;101924. doi: 10.1016/j.jksus.2022.101924. Online ahead of print. PMID: 35233153**

**Abstract:**

The function of Immune control, haematopoiesis, and inflammation all depend on the cytokine Interleukin 6 (IL-6), and higher expression of IL-6 is seen in COVID-19 and other diseases. The immune protein IL-6 activation is dependent on binding interactions with IL-6R $\alpha$ , mIL-6R, and sIL-6R for its cellular function. Termination of these reaction could benefit for controlling the over-expression in COVID-19 patients and that may arise as inhibitors for controlling COVID-19. Traditionally, the goat milk has been prescribed as medicine in ayurvedic practice and through this work, we have explored the benefits of peptides from goat milk as IL-6 inhibitors, and it have the potential of inhibiting the over expression of IL-6 and control the COVID-19 disease. Computational experiments have shown that goat peptides had strong interactions with IL-6, with higher scoring profiles and energy efficiency ranging from -6.00 kcal/mol to -9.00 kcal/mol in docking score and -39.00 kcal/mol in binding energy. Especially the YLGYLEQLLR, VLVLDTDYK and AMKPWIQPK peptides from goat milk holds better scoring and shows strong interactions were identified as the most potential IL-6 inhibitor candidates in this study. Peptides from Goat proteins, which are capable of binding to the IL-6 receptor with strong binding conformations, have no negative effects on other immune system proteins.

**Bhinge SD, Jadhav NR, Randive DS, Bhutkar MA, Chavan R, Kumbhar BV. Isolation and identification of hair growth potential fraction from active plant extract of *Blumea eriantha* DC grown in Western Ghat of India: In silico study. J Ayurveda Integr Med. 2022 Feb 25;13(2):100542. doi: 10.1016/j.jaim.2022.100542. Online ahead of print. PMID: 35228151**

**Abstract:**

**Background:** In Ayurveda, *Blumea eriantha* DC has been used in the management of various diseases and is found to exhibit antioxidant and anti-hyperlipidemic, hypoglycemic, anti-diarrhoeal, larvicidal, antimicrobial properties.

**Objective:** The present study has focused on isolation of the active fraction from *B. eriantha* DC extract and to investigate its effect as a hair growth promoter along with identification of phytoconstituent(s) responsible for hair growth activity and its probable mechanism of action.

**Materials and methods:** Our work introduces an effective isolation protocol for the active fraction from *B. eriantha* DC extract using chromatographic techniques. Fraction A was isolated by using mobile phase toluene:acetone (9:1). In-vitro and in-vivo methods were executed for the evaluation of hair growth activity. Moreover, the docked conformations of the isolated phytoconstituent Dimethyl sulfone was compared to Minoxidil for selected proteins namely 2FGF, 2PVC and 4U7P. The PDB identifications 2PVC (DNMT3L recognizes unmethylated histone H3 lysine 4), 4U7P (Crystal structure of DNMT3A-DNMT3L complex and 2FGF (Human Basic Fibroblast Growth Factor) were downloaded from Protein Data Bank.

**Results:** The study data revealed that *B. eriantha* DC alcoholic extracts exhibited prominent hair growth activity and it was affirmed that Dimethyl sulfone a phyto-constituent isolated from *B. eriantha* DC alcoholic extract contributed for the same.

Conclusion: The findings strongly suggest hair growth promotion potential of the extract of *B. eriantha* DC.

**Chaudhary R. Role of Medicinal Plants in the Diabetic Wound Healing Process. Curr Diabetes Rev. 2022 Feb 24. doi: 10.2174/1573399818666220224122142. Online ahead of print. PMID: 35209827**

**Abstract:**

**Aim:** Determining the relationship between diabetes and delayed wound healing from the literature. Research literature search from 2010-2020, research on various medicinal plants and their phytoconstituents that are effective in treating wound associated with diabetes. Determining potentially

medicinal plants that are used to treat wound and can be used to treat diabetes.

**Methodology:** Research and review articles from 2010 - 2020 have been researched on a variety of topics such as PubMed, Scopus, Mendeley, Google Scholar, Indian traditional medicine system, Ayurvedic treatment program using different words such as "diabetes", treatment of diabetes ", " Plants in the treatment of diabetes ", " wound healing ", " wound healing plants ".

**Conclusion:** Other herbs are also traditionally used to treat wounds. In this study, the main focus is on medicinal plants that are used specifically to treat wounds in diabetic conditions. Although quite a few medicinal floras for wound restoration may be observed in the literature, there's a need for the isolation and characterization of the bioactive compounds chargeable for the wound restoration properties. Also, cytotoxicity research needs to be executed at promising agents or bioactive fractions or extracts.

**Ferson MJ, Flanigan S, Cains T. Lead poisoning outbreak from consumption of contaminated Ayurvedic medication. Med J Aust. 2022 Feb 15. doi: 10.5694/mja2.51422. Online ahead of print. PMID: 35170062**

**Khan F, Shariq M, Asif M, Siddiqui MA, Malan P, Ahmad F. Green Nanotechnology: Plant-Mediated Nanoparticle Synthesis and Application. Nanomaterials (Basel). 2022 Feb 17;12(4):673. doi: 10.3390/nano12040673. PMID: 35215000**

**Abstract:**

The key pathways for synthesizing nanoparticles are physical and chemical, usually expensive and possibly hazardous to the environment. In the recent past, the evaluation of green chemistry or biological techniques for synthesizing metal nanoparticles from plant extracts has drawn the attention of many researchers. The literature on the green production of nanoparticles using various metals (i.e., gold, silver, zinc, titanium and palladium) and plant extracts is discussed in this study. The generalized mechanism of nanoparticle synthesis involves reduction, stabilization, nucleation, aggregation and capping, followed by characterization. During biosynthesis, major difficulties often faced in maintaining the structure, size and yield of particles can be solved by monitoring the development parameters such as temperature, pH and reaction period. To establish a widely accepted approach, researchers must first explore the actual process underlying the plant-assisted synthesis of a metal nanoparticle and its action on others. The green synthesis of NPs is gaining attention owing to its facilitation of the development of alternative, sustainable, safer, less toxic and environment-friendly approaches. Thus, green nanotechnology using plant extract opens up new possibilities for the synthesis of novel nanoparticles with the desirable characteristics required for developing biosensors, biomedicine, cosmetics and nano-biotechnology, and in

electrochemical, catalytic, antibacterial, electronics, sensing and other applications.

**Kumar S, Singh B, Singh R. Catharanthus roseus (L.) G. Don: A review of its ethnobotany, phytochemistry, ethnopharmacology and toxicities. J Ethnopharmacol. 2022 Feb 10;284:114647. doi: 10.1016/j.jep.2021.114647. Epub 2021 Sep 22. PMID: 34562562**

**Abstract:**

**Ethnopharmacological relevance:** *Catharanthus roseus* (L.) G. Don is a well known medicinal plant belonging to family Apocynaceae that have been traditionally used as medicine since ancient times. *C. roseus* is a well-recognized herbal medicine due to its anticancer bisindole alkaloids (vinblastine (111), vincristine (112) and vindesine (121)). In the Ayurvedic system of medicine, different parts of *C. roseus* are used in folklore herbal medicine for treatment of many types of cancer, diabetes, stomach disorders, kidney, liver and cardiovascular diseases.

**Aim of the study:** The main idea behind this communication is to update comprehensively and analyze critically the traditional applications, phytochemistry, pharmacological activities, and toxicity of various extracts and isolated compounds from *C. roseus*.

**Materials and methods:** The presented data covers scientific works on *C. roseus* published across the world between 1967 and 2021 was searched from various international publishing houses using search engines as well as several traditional texts like Ayurveda and relevant books. Collected data from different sources was comprehensively summarized/analyzed for ethnomedicinal uses, phytochemistry, analytical chemistry, biological activities and toxicity studies of *C. roseus*.

**Results and discussion:** *C. roseus* has a wide range of applications in the traditional system of medicine especially in cancer and diabetes. During phytochemical investigation, total of 344 compounds including monoterpene indole alkaloids (MIAs) (110), bisindole alkaloids (35), flavonoids (34), phenolic acids (9) and volatile constituents (156) have been reported in the various extracts and fractions of different plant parts of *C. roseus*. The extracts and isolated compounds of *C. roseus* have to exhibit many pharmacological activities such as anticancer/cytotoxic, antidiabetic, antimicrobial, antioxidant, larvicidal and pupicidal. The comparative toxicity of extracts and bioactive compounds investigated in dose dependent manner. The investigation of toxicity showed that the both extracts and isolated compounds are safe to a certain limit beyond that they cause adverse effects.

**Conclusion:** This review is a comprehensive, critically analyzed summarization of sufficient baseline information of selected topics in one place undertaken till date on *C. roseus* for future works and drug discovery. The phytochemical investigation including biosynthetic pathways showed that the

MIAs and bisindole alkaloids are major and characteristic class of compounds in this plant. The present data confirm that the extracts/fractions and their isolated alkaloids especially vinblastine (111) and vincristine (112) have a potent anticancer/cytotoxic and antidiabetic property and there is a need for further study with particular attention to the mechanisms of anticancer activity. In biosynthesis pathways of alkaloids especially bisindole alkaloids, some enzymes and rearrangement are unexposed therefore it is required to draw special attention. It also focuses on attracting the attention of scientific communities about the widespread biological activities of this species for its better utilization prospects in the near future.

**Kumari R, Kumar R, Rai A, Rai AK. Evaluation of Na and K in anti-diabetic ayurvedic medicine using LIBS. *Lasers Med Sci.* 2022 Feb;37(1):513-522. doi: 10.1007/s10103-021-03289-y. Epub 2021 Mar 23. PMID: 33755860**

**Abstract:**

Diabetes mellitus, known as diabetes, is a challenging issue, and to control diabetes, a large population is lining toward ayurvedic medicine. In the present study, four brands of anti-diabetic ayurvedic medicines, along with a home remedy, are analyzed using the laser-induced breakdown spectroscopic (LIBS) technique. The study is carried out to know the elements responsible for glycemic potential. The laser-induced breakdown (LIB) spectra elucidate the presence of organic and inorganic elements like Al, Ba, C, Ca, Cu, Fe, H, K, Mg, N, Na, O, Si, Sr, Zn, and the molecular band of CN molecule in medicines. LIBS result also reveals Na and K's distinct concentration, which plays a vital role in diabetes management. The presence of the CN band and organic elements indicate the presence of organic molecular compositions in medicines. For confirmation of organic composition in the drugs, Fourier transform infrared spectroscopy (FT-IR) has been performed. Principal component analysis (PCA) on the LIBS data of the medicines has been used for instant discrimination based on their elemental/molecular compositions.

**Li X, Wu L, Wu R, Sun M, Fu K, Kuang T et al. Comparison of medicinal preparations of Ayurveda in India and five traditional medicines in China. *J Ethnopharmacol.* 2022 Feb 10;284:114775. doi: 10.1016/j.jep.2021.114775. Epub 2021 Nov 4. PMID: 34742863**

**Abstract:**

**Ethnopharmacological relevance:** Ayurveda is the main traditional healthcare system in Indian medicine. Tibetan medicine (TM), Mongolian medicine (MM), Buddhist medicine (BM), Dai medicine (DM), and Uyghur medicine (UM) are main traditional medicines practiced in China. These are existing traditional medical systems that still play a role in disease prevention and treatment.

**Aim of the study:** To reveal the similarities and differences of traditional medicinal preparations between Ayurveda in India and five traditional



medicines in China to deepen medical exchanges and cooperation between the two countries and beyond.

**Methods:** All preparations were extracted from statutory pharmacopoeias, ministry standards, and prescription textbooks from China and India. The information of each preparation, such as therapeutic uses, medicinal materials, and preparation forms, was recorded in Excel for statistical analysis and visual comparison.

**Results:** A total of 645 Ayurvedic preparations, 458 TM preparations, 164 MM preparations, 616 BM preparations, 227 DM preparations, and 94 UM preparations were identified. Preparations of the six traditional medicines were mostly used for treating digestive, respiratory, and urogenital system diseases. The preparation forms of these six traditional medicines are mainly pills and powders. There are 38 shared-use medicinal materials in Ayurveda and TM preparations, 25 in Ayurveda and MM preparations, 30 in Ayurveda and BM preparations, 39 in Ayurveda and DM preparations, and 31 in Ayurveda and UM preparations. Finally, we selected one important shared-use preparation (Triphala) and 51 medicinal materials to research traditional use and modern pharmacology.

**Conclusions:** These preparations are used by different prescribers and users of medicinal materials in different medical systems with the similarities and differences. The similarities may reflect the historical exchanges of traditional medicines between the two countries. The differences showed that traditional medicines in China have absorbed some theories, diagnoses, and treatments from Ayurveda but also retained their own ethnic and regional characteristics.

**Mahija KC, Nazeer KA A. Repurposing Ayush-64 for COVID-19: A Computational Study Based on Network Pharmacology and Molecular Docking. Comb Chem High Throughput Screen. 2022 Feb 10. doi: 10.2174/1386207325666220210125923. Online ahead of print. PMID: 35142268**

**Abstract:**

**Background:** As COVID-19 pandemic continues to affect people's lives, the government of India gave emergency use approval to the ayurvedic antimalarial drug Ayush-64 in April 2021 to treat asymptomatic COVID-19 positive and mild COVID-19 positive patients.

**Objective:** This study aims to explore the therapeutic potential of Ayush-64 to treat COVID-19 and provide a new approach for repurposing Ayurvedic drugs.

**Methods:** The bioactives present in Ayush-64 were found along with their targets, and a plantbioactive-target network was created. A protein-protein interaction network of the common targets of Ayush-64 and COVID-19 was constructed and analyzed to find the key targets of Ayush-64 associated with the disease. Gene ontology and pathway enrichment analysis were performed

to find COVID-19 related biological processes and pathways involved by the key targets. The key bioactives were docked with SARS-CoV-2 main protease 3CL, native Human Angiotensin-converting Enzyme ACE2, Spike protein S1, and RNA-dependent RNA polymerase RdRp.

**Results:** From the 336 targets for Ayush-64, we found 38 key targets. Functional enrichment analysis of the key targets resulted in 121 gene ontology terms and 38 pathways. When molecular docking was performed with four receptors, thirteen bioactives showed good binding affinity comparable to that of the eight drugs presently used to treat COVID-19.

**Conclusion:** Network pharmacological analysis and molecular docking study of Ayush-64 revealed that it can be recommended to treat COVID-19. Further in vitro and in vivo studies are needed to confirm the results. The study demonstrated a new approach for repurposing Ayurvedic drugs.

**Mishra S, Kajaria D. Ayurvedic management of amoebic liver abscess-a case report. J Ayurveda Integr Med. 2022 Feb 14:100520. doi: 10.1016/j.jaim.2021.08.013. Online ahead of print. PMID: 35177294**

**Abstract:**

Liver abscesses are purulent collections in the liver parenchyma that result from bacterial, fungal, or parasitic infection. The Antibiotics, percutaneous drainage and surgery are the only therapeutic solution for this condition. A 30-year young gentleman a diagnosed case of multiple Amoebic liver abscesses visited at All India Institute of Ayurveda. He came with complaints of rectal bleeding, fever, pain in the abdomen along with blood and USG of abdomen showed multiple Liver Abscesses. In this case of liver abscess, after taking informed consent the patient was given an Ayurvedic treatment for 60 days without any Allopathic medicine or any invasive technique. There was a significant reduction noted in the symptoms of Abscess. At the end of treatment, USG examination revealed there was no focal defect or lesion in the liver and haematological parameters were found within the reference range. There were no clinically significant adverse reactions noted in the duration of treatment. The results of this study indicate the clinical efficacy of Ayurvedic treatment in the management of liver abscess and patient gave highly satisfactory response after his treatment. The treatment outcomes in the present case indicate that classical Ayurvedic measures may be helpful to the patients of a liver abscess.

**Munshi R, Kumbhar D, Pawaskar P, Rajadakshya G, Palep HS. Open-labelled, randomised, controlled, proof of concept clinical trial to evaluate the efficacy of AYUSH interventions (Cap.Torchnil + Tab. Febcin) as add-on therapy in the clinical management of moderate Covid-19 patients. J Ayurveda Integr Med. 2022 Feb 24:100559. doi: 10.1016/j.jaim.2022.100559. Online ahead of print. PMID: 35228783**

**Abstract:**

**Background:** The COVID-19 pandemic is the latest public health crisis that is threatening the world and till date, there is no evidence of any effective treatment for COVID-19. The Department of AYUSH is taking efforts to find effective herbal Ayurvedic medicines for both preventive and therapeutic management.

**Objectives:** This clinical study was conducted to evaluate the efficacy and safety of 2 AYUSH interventions (Cap.Torchnil + Tab. Febcin) when given as add-on therapy in the clinical management of Covid19 positive patients with moderate disease.

**Material and methods:** This open-labelled, randomised, controlled, comparative proof-of-concept clinical study was conducted in a dedicated Covid hospital in patients admitted with COVID19 disease of moderate severity. Following written informed consent, patients were randomised to receive either study medications (Cap.Torchnil- 1 capsule thrice daily & Tab.Febcin- 1 tablet 4 times daily) in addition to standard of care (SOC) [Add-on Group] or only SOC [SOC Group] for 14 days. Effect on clinical symptoms, WHO Clinical Assessment scale, duration of hospital stay, time to RT-PCR negative report, need for supplemental oxygen, effect on biomarkers were assessed during admission and relapse rate, if any, post discharge for total of 3 months. Safety assessment was done both clinically & using laboratory parameters viz. haematology & biochemical tests.

**Results:** 193 patients were screened while 150 completed the study, 77 in Add-on Group and 73 in SOC Group. Covid related symptoms, especially headache and dry cough improved earlier in Add-on Group as compared to SOC Group which was statistically significant. Improvement in WHO Assessment scale, time to covid negative report and duration of hospital stay was earlier in Add-on Group (at day 7). Although improvement in serum biomarker levels was seen in both groups, a statistically significant fall was observed in Add-on Group for CPK, D-dimer and IL-6 values at Day 14 and LDH levels at Days 7 & 14. Improvement in SpO<sub>2</sub> and oxygen requirements was also seen earlier in Add-on Group as compared to SOC Group. No major adverse effects were observed in both groups except 2 patients who complained of hyperacidity in Add-on Group. Post discharge, 49 patients from Add-on Group and 42 patients from SOC Group came for physical visits. All these patients were clinically stable with no worsening of their clinical condition and no signs or symptoms suggestive of a repeat Covid infection. Their vital signs and SpO<sub>2</sub> levels were within the normal range in both groups.

**Conclusion:** The study results thus showed that a combination of Cap. Torchnil and Tab. Febcin was effective and safe when given as an add-on therapy to SOC in the clinical management of patients with moderate COVID-19 disease.

**Murthy HN. Biotechnological production of bacosides from cell and organ cultures of *Bacopa monnieri*. Appl Microbiol Biotechnol. 2022 Feb 24. doi: 10.1007/s00253-022-11834-0. Online ahead of print. PMID: 35201388**

## **Abstract:**

*Bacopa monnieri* (L.) Wettst. (BM), also known as 'Brahmi' or 'Water Hyssop', has been utilized as a brain tonic, memory enhancer, sensory organ revitalizer, cardiogenic, anti-anxiety, antidepressant and anticonvulsant agent in the Indian system of medicine Ayurveda for centuries. BM is beneficial in the treatment of Parkinson's disease, Alzheimer's disease, epileptic seizures and schizophrenia in recent pharmacological research. Dammarane-type triterpenoid saponins containing jujubogenin and pseudojujubogenin as aglycones, also known as bacosides, are the principal chemical ingredients identified and described from BM. Bacosides have been shown to have anti-ageing, anticancer, anticonvulsant, antidepressant, anti-emetic, anti-inflammatory and antibacterial properties in a variety of pre-clinical and clinical studies. The pharmaceutical industry's raw material comes from wild sources; nevertheless, the concentration of bacosides varies in different regions of the plants, as well as seasonal and genotypic variation. Cell and tissue cultures are appealing alternatives for the long-term manufacture of bioactive chemicals, and attempts to produce bacosides using in vitro cultures have been made. This review discusses the biotechnological approaches used to produce bacosides, as well as the limitations and future potential. Key points- Bacosides extracted from *Bacopa monnieri* are important pharmaceutical compounds. The current review provides insight into biotechnological interventions for the production of bacosides using in vitro cultures. Highlights the prospects improvement of bacoside production through metabolic engineering.

**Ninave PB, Patil SD. Pharmacological screening of *Acalypha indica* L.: Possible role in the treatment of asthma. *J Ethnopharmacol.* 2022 Feb 8;290:115093. doi: 10.1016/j.jep.2022.115093. Online ahead of print. PMID: 35149129**

## **Abstract:**

**ethnopharmacological relevance:** *Acalypha indica* Linn (Euphorbiaceae), a popular traditional medicine, is an erect herb found throughout various parts of India. In Ayurveda, *Acalypha indica* was commonly used in asthma and allergy. However, no attempts were made in past to validate the antiasthmatic potential of *Acalypha indica*.

**Aim of the study:** The present study was aimed to assess the anti-asthmatic potential of ethanolic extracts of *Acalypha indica* leaves (EAIL) using various experimental animal models.

**Materials and methods:** EAIL was analyzed using different screening methods such as acetylcholine and histamine-induced contraction of goat tracheal chain, clonidine-induced catalepsy in mice, milk-induced leucocytosis and eosinophilia in mice, clonidine-induced mast cell degranulation in rats, passive paw anaphylaxis in rats, histamine-induced bronchoconstriction in guinea pigs, and ovalbumin (OVA)-induced histopathological alterations in mice.

**Results:** Data received in the present study showed that EAIL drastically antagonized acetylcholine and histamine-induced contraction of goat tracheal chain, suggesting its anticholinergic and antihistaminic activity respectively. The duration of immobility, produced by clonidine, was found to be decreased in mice which showed its H1 receptor blocking activity. In milk-induced leucocytosis and eosinophilia in mice, EAIL significantly reduced the number of leucocytes and eosinophils suggesting its adaptogenic and anti-allergic potential. Inhibition of clonidine-induced mast cell degranulation in rats displayed its mast cell stabilizing potential. Reduction of paw edema in passive paw anaphylaxis exhibited antianaphylactic activity of EAIL. Guinea pigs were protected from histamine-induced bronchoconstriction by EAIL which revealed its bronchodilator potential. Furthermore, the histopathological architecture of lung tissue was near to normal.

**Conclusion:** Our results contribute towards validation of the traditional use of *Acalypha indica* in the treatment of asthma due to the presence of a wide range of phytoconstituents. Hence our investigation revealed that EAIL possessed strong antiasthmatic property by virtue of various mechanisms.

**Raj D, Sharma V, Upadhyaya A, Kumar N, Joshi R, Acharya V et al. Swertia purpurascens Wall ethanolic extract mitigates hepatic fibrosis and restores hepatic hepcidin levels via inhibition of TGF $\beta$ /SMAD/NF $\kappa$ B signaling in rats. J Ethnopharmacol. 2022 Feb 10;284:114741. doi: 10.1016/j.jep.2021.114741. Epub 2021 Oct 24. PMID: 34699946**

**Abstract:**

**Ethnopharmacological relevance:** *Swertia purpurascens* Wall belongs to a well-known genus in traditional systems of medicine worldwide. In folklore, it is used to treat various ailments, including hepatic disorders, as an alternative to the endangered species *Swertia chirayita*. However, the therapeutic potential of *Swertia purpurascens* Wall against hepatic fibrosis has not been validated yet.

**Aim of the study:** The present study was planned to evaluate the efficacy of the *Swertia purpurascens* Wall extract (SPE) against hepatic fibrosis and elucidate the underlying mechanism of action.

**Materials and methods:** The metabolite profiling of the SPE was done using UHPLC-QTOF-MS/MS. The acute oral toxicity study of SPE at 2 g/kg BW dose was done in rats. Further, the liver fibrosis was induced by the CCl<sub>4</sub> intoxication, and the efficacy of SPE at three doses (100, 200 and 400 mg/kg BW) was evaluated by studying biochemical parameters, histopathology, immunohistochemistry, qRT-PCR, western blotting and in silico analysis.

**Results:** UHPLC-QTOF-MS/MS analysis revealed the presence of a total of 23 compounds in SPE. Acute oral toxicity study of SPE at 2 g/kg BW showed no harmful effects in rats. Further, the liver fibrosis was induced by the CCl<sub>4</sub> administration, and the efficacy of SPE was evaluated at three doses (100, 200

and 400 mg/kg BW). SPE treatment significantly improved the body weight gain, the relative liver weight, serum liver injury markers and endogenous antioxidant enzyme levels in the CCl<sub>4</sub>-treated rats. SPE also recovered the altered liver histology and effectively reduced the fibrotic tissue deposition in the hepatic parenchyma. Further, SPE significantly inhibited the fibrotic (TGF $\beta$ ,  $\alpha$ SMA, SMADs and Col1A), proinflammatory markers (NF $\kappa$ B, TNF $\alpha$  and IL1 $\beta$ ) and apoptosis in the liver tissue. Interestingly, SPE treatment also restored the altered hepcidin levels in the liver tissue. In silico study revealed the potential of various metabolites as drug candidates and their interaction with target proteins.

**Conclusion:** Altogether, SPE showed its therapeutic potential against CCl<sub>4</sub>-induced hepatic fibrosis by restoring the hepatic hepcidin levels and inhibiting TGF $\beta$ /SMAD/NF $\kappa$ B signaling in rats.

**Sanyal R, Nandi S, Pandey S, Chatterjee U, Mishra T, Datta S et al. Biotechnology for propagation and secondary metabolite production in *Bacopa monnieri*. Appl Microbiol Biotechnol. 2022 Feb 26. doi: 10.1007/s00253-022-11820-6. Online ahead of print. PMID: 35218388**

**Abstract:**

*Bacopa monnieri* (L.) Wettst. or water hyssop commonly known as "Brahmi" is a small, creeping, succulent herb from the Plantaginaceae family. It is popularly employed in Ayurvedic medicine as a nerve tonic to improve memory and cognition. Of late, this plant has been reported extensively for its pharmacologically active phyto-constituents. The main phytochemicals are brahmine, alkaloids, herpestine, and saponins. The saponins include bacoside A, bacoside B, and betulic acid. Investigation into the pharmacological effect of this plant has thrived lately, encouraging its neuroprotective and memory supporting capacity among others. Besides, it possesses many other therapeutic activities like antimicrobial, antioxidant, anti-inflammatory, gastroprotective properties, etc. Because of its multipurpose therapeutic potential, it is overexploited owing to the prioritization of natural remedies over conventional ones, which compels us to conserve them. *B. monnieri* is confronting the danger of extinction from its natural habitat as it is a major cultivated medico-botanical and seed propagation is restricted due to less seed availability and viability. The ever-increasing demand for the plant can be dealt with mass propagation through plant tissue culture strategy. Micropropagation utilizing axillary meristems as well as de novo organogenesis have been widely investigated in this plant which has also been explored for its conservation and production of different types of secondary metabolites. Diverse in vitro methods such as organogenesis, cell suspension, and callus cultures have been accounted for with the aim of production and/or enhancement of bacosides. Direct shoot-organogenesis was initiated in excised leaf and internodal explants without any exogenous plant growth regulator(s) (PGRs), and the induction rate was improved when exogenous cytokinins and other supplements were used. Moreover, biotechnological toolkits like *Agrobacterium*-mediated transformation and the use of mutagens have been

reported. Besides, the molecular marker-based studies demonstrated the clonal fidelity among the natural and in vitro generated plantlets also elucidating the inherent diversity among the natural populations. Agrobacterium-mediated transformation system was mostly employed to optimize bacoside biosynthesis and heterologous expression of other genes. The present review aims at depicting the recent research outcomes of in vitro studies performed on *B. monnieri* which include root and shoot organogenesis, callus induction, somatic embryogenesis, production of secondary metabolites by in vitro propagation, acclimatization of the in vitro raised plantlets, genetic transformation, and molecular marker-based studies of clonal fidelity. KEY POINTS: • Critical and up to date records on in vitro propagation of *Bacopa monnieri* • In vitro propagation and elicitation of secondary metabolites from *B. monnieri* • Molecular markers and transgenic studies in *B. monnieri*.

**Sarkar A, Agarwal R, Bandyopadhyay B. Molecular docking studies of phytochemicals from *Terminalia chebula* for identification of potential multi-target inhibitors of SARS-CoV-2 proteins. J Ayurveda Integr Med. 2022 Feb 16:100557. doi: 10.1016/j.jaim.2022.100557. Online ahead of print. PMID: 35185301**

**Abstract:**

The COVID-19 caused by Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has emerged as a global pandemic claiming more than 1.8 million deaths worldwide and no medicine has still been developed till date which is proved to have 100% efficiency in combating against this deadly disease. *Terminalia chebula* (*T. chebula*) is known to have antibacterial, antifungal, antiviral, antioxidant, anti-inflammatory properties. In this study, we performed blind docking studies on fifteen phytochemicals from *T. chebula* to identify potential candidate against the proteins of SARS-CoV-2. Our docking results combined with analysis of Atomic Contact Energy (ACE) data identified 1,3,6-Trigalloyl glucose ( $-332.14 \pm 55.74$  kcal/mol), Beta-Sitosterol ( $-324.75 \pm 36.98$  kcal/mol) and Daucosterol ( $-335.67 \pm 104.79$  kcal/mol) as the most promising candidates which exhibit significantly high inhibition efficiency against all eight SARS-CoV-2 protein targets and these three can be used as potential multi-target drug in treatment and prevention of COVID-19. We believe that our study has the potential to help the scientific communities to develop the multi-target drug from *T. chebula* to combat against the deadly pathogen SARS-COV-2 in future with the support of extensive wet lab analysis.

**Shakeri F, Bibak B, Safdari MR, Keshavarzi Z, Jamialahmadi T, Sathyapalan T et al. Cellular and molecular mechanisms of curcumin on thyroid gland disorders. Curr Med Chem. 2022 Feb 10. doi: 10.2174/0929867329666220210145033. Online ahead of print. PMID: 35142266**

**Abstract:**

There is growing literature on the positive therapeutic potentials of curcumin. Curcumin or diferuloylmethane is a polyphenol obtained from the plant *Curcuma longa*. Curcumin has been used widely in Ayurvedic and Chinese medicine for various conditions. The role of curcumin on thyroid glands has been shown by its effects on various biological pathways, including anti-inflammatory, antioxidant, anti-proliferative, apoptosis, angiogenesis, cell cycle and metastasis. We reviewed the recent literature on curcumin applications for thyroid dysfunction, including hyperthyroidism and hypothyroidism, and discussed the molecular mechanisms of these effects. This review aims to summarize the wealth of research related to the thyroid gland therapeutic effect of curcumin.

**Sharma RK, Jalalpure SS, Chouhan MK, Deshpande S, Acharya R, Hegde S. Decipher the inhibitory potential of phytochemicals from *Leptadenia reticulata* on dopamine D2 receptor to enhance prolactin secretion. Drug Res (Stuttg). 2022 Feb 17. doi: 10.1055/a-1735-2887. Online ahead of print. PMID: 35176795**

**Abstract:**

Dopamine is secreted by the hypothalamus, which inhibits the proliferation and effectiveness of lactotroph cells that release prolactin via dopamine D2 receptor (D2R). D2R activation inhibits lactotroph cell prolactin synthesis and regulates prolactin gene expression. Although, commercial medications are available for hypogalactia and agalactia, various plant sources significantly alleviate these problems. *Leptadenia reticulata* (Jivanti) is one of the important medicinal plants often consumed by nursing mothers to improve breast milk production. However, mechanism and chemical constituents involved in the inhibition of D2R by Jivanti is unclear. Therefore, in this study the phytochemicals reported from Jivanti were used for in-silico analysis to predict D2R inhibitory potential. The binding affinity value of campesterol and  $\beta$ -sitosterol (- 10.1 and -10.0 kcal/mol) with D2R has high revealed by molecular docking and stable interaction revealed by molecular dynamics simulation. Thus, these lead compounds could exert more D2R inhibitory activity resulting into prolactin release, which may lead to an increase in breast milk production. Although all selected compounds had fine permeation, non-toxic, and non-carcinogenic characteristics predicted by ADMET, campesterol had good solubility, absorption characteristics compared to other. Therefore, Jivanti, which is traditionally known medicinal plant, could be explored as a medication candidate to boost breast milk production.

**Singh M, Hirlekar BU, Mondal S, Pant S, Dhaked DK, Ravichandiran V et al. Isolation of phytochemicals from *Dolichandrone atrovirens* followed by semisynthetic modification of ixoside via azomethine ylide cycloaddition; computational approach towards chemo-selection. Nat Prod Res. 2022 Feb 6:1-10. doi: 10.1080/14786419.2022.2037084. Online ahead of print. PMID: 35129017**

**Abstract:**



Aims of the study were the phytochemical investigation and chemical transformation of isolated compounds of medicinal plant listed in 'Ayurveda' like *Dolichandrone atrovirens*, endemic to Indian subcontinents. From chloroform extract of *D. atrovirens* four compounds; Ursolic acid (1), Maslinic acid (2), Lupeol (3),  $\beta$ -sitosterol (4) and from methanol extract five compounds;  $\beta$ -sitosterol-3-*O*- $\beta$ -D-glucopyranoside (5), 10-*O*-*trans*-*p*-Methoxycinnamoylcatalpol (6), Kaempferol-3-*O*- $\beta$ -D-glucopyranoside (7), 6-*O*-[6''(S)-hydroxy-2'',6''dimethyl-2''(E)-7''-octadienoyl] catalpol (8) and Ixoside (9) were isolated. Ixoside was used for the semi-synthetic modification via azomethine ylide cycloaddition leading to novel spiro-oxindolo-pyrrolizidine adduct. The structures of novel adducts were elucidated by analysis of IR, MS and 1D/2D NMR data. Furthermore, to confirm the chemo selection of only one double bond, we performed density functional theory (DFT) calculation, which confirms the chemo selectivity. In addition, *in-silico* ADME studies and atom-additive approach based on SASA was also examined for the molecules which suggest that they may be potential future candidates for drug discovery.

**Suryavanshi SV, Barve K, Utpat SV, Kulkarni YA. Triphala churna ameliorates retinopathy in diabetic rats. Biomed Pharmacother. 2022 Feb 12;148:112711. doi: 10.1016/j.biopha.2022.112711. Online ahead of print. PMID: 35168075**

#### **Abstract:**

Diabetic retinopathy is one of the most prevalent complications of diabetes affecting a large number of people worldwide. Triphala churna - an Ayurvedic formulation consisting of powder of three fruits, *Emblica officinalis*, *Terminalia bellirica* and *Terminalia chebula* has potent antioxidant and anti-diabetic properties. Hence, the study was designed to evaluate the effect of Triphala churna in diabetic retinopathy. Diabetes was induced in rats with streptozotocin (55 mg/kg, i.p.). After four weeks of induction, animals were treated with Triphala churna powder mixed in a vehicle at a dose of 250, 500, and 1000 mg/kg for the next four weeks. At the end of the study, plasma glucose, lactate dehydrogenase levels were determined. Sorbitol dehydrogenase, aldose reductase, and oxidative stress parameters were determined in lens tissues. Electroretinography was carried out. Histopathology study of the retina was studied at the end of the study. Triphala churna significantly reduced plasma glucose and lactate dehydrogenase levels. Triphala significantly reduced sorbitol dehydrogenase, aldose reductase, and oxidative stress in lens tissues. Furthermore, Triphala significantly increased 'a' wave and 'b' wave amplitude with a reduction in the latencies. The retinal thickness was significantly reduced in Triphala-treated animals. From the results, it can be concluded that Triphala churna delays the progression of retinopathy in diabetic rats.

**Tan MA, Sharma N, An SSA. Multi-Target Approach of *Murraya koenigii* Leaves in Treating Neurodegenerative Diseases. Pharmaceuticals (Basel). 2022 Feb 2;15(2):188. doi: 10.3390/ph15020188. PMID: 35215300**

**Abstract:**

Neurodegenerative diseases (NDs) mainly affect neurons and gradually lead to a loss of normal motor and cognitive functions. Atypical protein homeostasis-misfolding, aggregations and accumulations, oxidative stress, inflammation, and apoptosis-are common features in most NDs. To date, due to the complex etiology and pathogenesis of NDs, no defined treatment is available. There has been increasing interest in plant extracts as potential alternative medicines as the presence of various active components may exert synergistic and multi-pharmacological effects. *Murraya koenigii* (Rutaceae) is utilized in Ayurvedic medicine for various ailments. Pharmacological studies evidenced its potential antioxidant, anti-inflammatory, anticancer, hepatoprotective, immunomodulatory, antimicrobial, and neuroprotective activities, among others. In line with our interest in exploring natural agents for the treatment of neurodegenerative diseases, this review presents an overview of literature concerning the mechanisms of action and the safety profile of significant bioactive components present in *M. koenigii* leaves to support further investigations into their neuroprotective therapeutic potential.

**Varghese T, Vijayakumar S, Boban N, R SS, L V, Robin DT et al. Severe Lead Toxicity Due to Ayurvedic Medicine in a Child with Type 1 Diabetes Mellitus: Correspondence. Indian J Pediatr. 2022 Feb 16. doi: 10.1007/s12098-022-04088-1. Online ahead of print. PMID: 35171435**

**Vinothkanna A, Mathivanan K, Ananth S, Ma Y, Sekar S. Biosynthesis of copper oxide nanoparticles using Rubia cordifolia bark extract: Characterization, antibacterial, antioxidant, larvicidal and photocatalytic activities. Environ Sci Pollut Res Int. 2022 Feb 17. doi: 10.1007/s11356-022-18996-4. Online ahead of print. PMID: 35175521**

**Abstract:**

*Rubia cordifolia* represents the pivotal plant resource belonging to traditional Chinese medicine and Indian Ayurveda. The present study aims to synthesize biocompatible copper oxide nanoparticles (CuONPs) using *R. cordifolia* bark extracts, characterize the incumbent chemical transitions, and explore their biomedical and environmental applications. The absorbance peak between 250 and 300 nm clearly demonstrates the formation of CuONPs in the UV-visible spectrum. Fourier transform infrared spectroscopy results showed the presence of functional groups essential for copper ion reduction. Field emission scanning electron microscopy (FE-SEM) and dynamic light scattering analysis revealed that the CuONPs are spherical-shaped with a mean particle size of 50.72 nm. Additionally, the zeta potential demonstrates its robustness at 11.2 mV. X-ray diffraction pattern showed mixed phases (Cu, Cu<sub>2</sub>O, and CuO) of cubic monoclinic crystalline nature. CuONPs exhibited noticeable antibacterial activity against Gram-negative (*Escherichia coli* and *Pseudomonas aeruginosa*) and Gram-positive (*Staphylococcus aureus* and *Bacillus cereus*) pathogenic bacteria. Bacterial cell damages were affirmed through FE-SEM imaging when treated with CuONPs. Further, CuONPs demonstrated considerable

antioxidant activities by quenching free radicals such as DPPH (60.75%), ABTs (70.88%), nitric oxide (65.48%) and reducing power (71.44%) in a dose-dependent way. CuONPs showed significant larvicidal activity against *Aedes aegypti* ( $65 \pm 8.66\%$ ), *Anopheles stephensi* ( $80 \pm 13.69\%$ ), and *Culex quinquefasciatus* ( $72 \pm 13.04\%$ ) mosquito larvae. The photocatalytic activity of the CuONPs demonstrates the methylene blue (81.84%) and crystal violet (64.0%) dye degradation potentials, indicating the environmental bioremediation efficacy. Hence the present study is the first report in accounting for the versatile applications of the phyto-CuONPs. Moreover, the green synthesis of CuONPs has future applications in designing the drug for life-threatening diseases and various environmental issues.

**Wayal SR, Barke SA, Nigade G, Jagtap P, Gurav NS, Prasad S et al. Effect of "Murcchana samskara" on therapeutic efficacy of BhallatakadiGhrita. J Ayurveda Integr Med. 2022 Feb 23;13(2):100547. doi: 10.1016/j.jaim.2022.100547. Online ahead of print. PMID: 35219071**

**Abstract:**

'Bhallatakadi Ghrita' (BG), comprising the plant extracts of *Semecarpus anacardium* L., *Argemone mexicana* L., *Cocculus hirsutus* L., and *Woodfordia fruticosa* K. 'Murcchana samskara' of ghee before any 'ghrita-paka' preparation evidenced the maximum acceptability for topical application. The current study dealt with the effect of the 'Murcchana' process on the therapeutic efficacy of BG. In the first step, 'Murcchita' ghee was prepared as per reference texts and then developed the 'Murcchita Bhallatakadi Ghrita' (M-BG), which was further assessed for wound healing activity using incision and excision wound animal models. 'Murcchanasamskara' altered the wound healing ability of M-BG (100% wound contraction on 15th post wounding day with  $13.50 \pm 0.22$  days complete re-epithelization time and  $562.33 \pm 7.37$  g breaking strength). The presence of antioxidants, polyphenols, flavonoids, and fatty acids (known for their potential wound healing properties) in M-BG could accelerate the wound contraction rate ( $P < 0.001$ ). The present investigation has corroborated the Ayurvedic/traditional attribute of 'Murcchanasamskara' to augment the medicinal properties of the BG.

**Yeggoni DP, Rachamalla A, Subramanyam R. Comparative binding studies of bacosine with human serum albumin and  $\alpha$ -1-acid glycoprotein biophysical evaluation and computational approach. J Pharm Biomed Anal. 2022 Feb 5;209:114478. doi: 10.1016/j.jpba.2021.114478. Epub 2021 Nov 24. PMID: 34894460**

**Abstract:**

Bacosine (BAC) is a natural product isolated from a herb and used in the Ayurvedic system of medicine. It is reported to have a wide array of biological activities, which has generated interest in its therapeutic potential. To better understand how BAC may operate as a potential anti-cancer therapeutic, we examined its anti-cancer properties in the human breast cancer cell line, MCF-

7. In order to get an idea of how it may behave in vivo, we also evaluated its interaction with human serum albumin (HSA) and  $\alpha$ -1-acid glycoprotein (AGP) using fluorescence spectroscopy and in silico molecular modelling. Based on our in vitro studies, we found that BAC inhibited MCF-7 cell growth in a dose-dependent manner with an  $IC_{50}$  value of 9  $\mu$ M. In addition, the intrinsic fluorescence of HSA and AGP was quenched by BAC, consistent with a static quenching mechanism. Fluorescence emission spectroscopy revealed a binding of  $2.97 \pm 0.01 \times 10^4 \text{ M}^{-1}$  for HSA-BAC which corresponded to a free energy change of - 6.07 kcal/mol at 25 °C. In addition, we found that BAC had a binding constant of  $1.8 \pm 0.02 \times 10^3 \text{ M}^{-1}$  to AGP which corresponded to a change in free energy - 4.42 kcal/mol at 25 °C. We also identified the site of BAC binding to the HSA protein using the site-specific marker, phenylbutazone, along with molecular docking studies. Circular dichroism spectra revealed partial changes in the secondary structure of HSA in the presence of BAC suggesting direct interactions. Molecular dynamics simulations demonstrated that the HSA-BAC complex reaches an equilibration state at around 4 ns, suggesting that the HSA-BAC complex is quite stable. Our results provide evidence that serum proteins can act as a carrier protein for BAC, potentially impacting its development as an anti-cancer agent.

## UNANI MEDICINE

**Ain Q, Nawab M, Ahmad T, Kazmi MH, Naikodi MAR. Evaluating the safety and efficacy of a polyherbal Unani formulation in dyslipidaemia-a prospective randomized controlled trial. J Ethnopharmacol. 2022 May 10;289:115036. doi: 10.1016/j.jep.2022.115036. Epub 2022 Feb 1. PMID: 35114340**

### **Abstract:**

**Ethnopharmacological relevance:** Unani System of Medicine offers treatment for obesity and dyslipidaemia. Jawarish Falafili (JF) is a Unani polyherbal pharmacopoeial preparation. It has been used in the treatment of obesity for a long time. Dyslipidaemia is a recognised modifiable risk factor for hypertension, ischemic heart disease and stroke. Limitations of the current conventional therapy have provided scope for research of a potential drug in this medical condition. It was hypothesised that JF may ameliorate dyslipidaemia in human participants.

**Aim of the study:** The main objective of this study was to evaluate the safety and efficacy of the JF.

**Materials and methods:** This was a prospective randomized, active-controlled, open-label and parallel-group study. We randomized 74 participants of dyslipidaemia into treatment (n = 38) and control (n = 36) groups. Of them, 30 participants in each group completed the trial. The participants of any sex aged between 30 and 60 years, with serum total cholesterol (TC)  $\geq 200$  mg/dl and/or serum triglycerides (TG)  $\geq 150$  mg/dl and/or low-density lipoprotein cholesterol (LDL-C) level  $\geq 130$  mg/dl and/or high-density lipoprotein cholesterol (HDL-C) level  $< 40$  mg/dl were enrolled in this study. The participants of the treatment group were treated with JF (10 gm/day) once and atorvastatin (20 mg/day) was given to the control group for 90 days once at night daily.

**Results:** We observed a significant reduction (treatment group versus control group) in mean serum TC by 22.89% versus 19.36%, TG by 29.90% versus 23.26% and LDL-C by 29.16% versus 27.92% from baseline ( $p < 0.05$ ). But the change in mean serum HDL-C levels post-treatment was insignificant in both groups ( $p > 0.05$ ). On intergroup comparison, the magnitude of the difference of mean TC, TG, LDL-C and HDL-C levels between the groups was not statistically significant ( $p > 0.005$ ).

**Conclusions:** This study concluded that JF and atorvastatin were equally effective in controlling dyslipidaemia. They were tolerated well by all participants and found safe during the course of treatment.

**Imran S, Khalid M, Husain N, Khan MQ, Shaikh S. Efficacy of topical Marham-e-Akbar in chronic atopic dermatitis: An open-label interventional study. Drug Metab Pers Ther. 2022 Feb 25. doi: 10.1515/dmpt-2021-0195. Online ahead of print. PMID: 35218174**

**Abstract:**

**Objectives:** Chronic atopic dermatitis (AD) is an inflammatory skin condition marked by intense pruritus, dry skin, and severe impact on the life quality of the patients. Conventionally, it is managed by using emollients, calcineurin inhibitors, and topical corticosteroids. In Unani medicine, eminent scholars advocated many drug formulations including topical Marham-e-Akbar for effective healing of AD but scientific evidence is scarce. Hence, this study was designed.

**Methods:** This was a single-arm clinical trial conducted on 30 participants aged 18-65 years suffering from chronic AD after obtaining written informed consent. The trial intervention was Marham-e-Akbar consisting of Murdār Sang (Plumbi oxidum); Sindūr (red lead); olive oil (*Olea europaea* oil); Kath (*Acacia catechu* extract); Safeda Kāshgari (Zinc oxide); Sirka (vinegar); and Phitkirī (alum) to be applied twice daily for 42 days. The objective parameters were SCORAD and DLQI, while the subjective parameters included itching, scaling, and erythema assessed on a customized VAS scale and 4-point Likert scale.

**Results:** The pre-post analysis inferred statistically significant attenuation in subjective parameters (itching, scaling, and erythema) and objective scales (SCORAD) and (DLQI) with  $p < 0.001$ .

**Conclusions:** The study findings deduced that Marham-e-Akbar is effective in the amelioration of chronic atopic dermatitis and quality of life of the patients as well.

**Khan TA, Farooqi I, Swalehin M, Hamid W. Qualitative study on the health-seeking behavior and its determinants among carpet weavers in Kashmir. Health Promot Int. 2022 Feb 17;37(1):daab046. doi: 10.1093/heapro/daab046. PMID: 34002216**

**Abstract:**

We conducted this study to examine the nature of treatment-seeking behavior among carpet weavers in Kashmir. We used a grounded theory approach to gain an in-depth understanding of the phenomenon. Data were collected through face-to-face interviews with 35 research participants recruited through purposive and theoretical sampling techniques. Based on the primary data, our study reveals that carpet weavers approached different agencies and used multiple methods for seeking treatment for their illness(es). The majority of the participants relied on spiritual healers, followed by traditional methods, Unani treatment, compounders and self-medication, while modern medicine was the last option for seeking treatment. We also found that participants base their choices about when and where to seek treatment on multiple socio-economic and cultural factors like financial constraints, perception towards illness, no provision for leave, costly and lengthy medical treatment, side effects of modern medicine, the nature of the disease, lack of infrastructure and insecurity due to conflict. These findings are relevant to employers and various government as well as non-government organizations. Additional

implications of these findings for carpet weavers, public health, for practice and research are also discussed.

## **SIDDHA**

**Bhattacharyya S, Law S. Environmental pollutant N-N'ethylnitrosourea-induced leukemic NLRP3 inflammasome activation and its amelioration by Eclipta prostrata and its active compound wedelolactone. Environ Toxicol. 2022 Feb;37(2):322-334. doi: 10.1002/tox.23400. Epub 2021 Nov 2.**

**PMID: 34726823**

### **Abstract:**

Environmental exposure of N-nitroso compounds (NOCs) from various sources like tobacco smoke, pesticides, smoked meat, and rubber manufacturing industries has been an alarming cause of carcinogenesis. Neonatal exposure to the carcinogenic N-N'ethylnitrosourea (ENU), a NOC has been established to cause leukemogenesis. Our world is constantly battling against cancer with consistent investigations of new anti-cancer therapeutics. Plant derived compounds have grasped worldwide attention of researchers for their promising anti-cancer potentials. Eclipta prostrata is one such ayurvedic herb, renowned for its anti-inflammatory properties. Currently, it has been explored in various cancer cell lines to establish its anti-cancer effect, but rarely in in-vivo cancer models. Wedelolactone (WDL), the major coumestan of E. prostrata is recognized as an inhibitor of IKK, a master regulator of the NF- $\kappa$ B inflammatory pathway. As persistent inflammation and activated inflammasome contribute to leukemogenesis, we tried to observe anti-leukemogenic efficacy of E. prostrata and its active compound WDL on the marrow cells of ENU induced experimental leukemic mice. Treatment groups were administered an oral gavage at a dose of 1200 mg/kg and 50 mg/kg b.w of crude extract and WDL respectively for 4 weeks. Various parameters like hemogram, survivability, cytological and histological investigations, migration assay, cell culture, flowcytometry and confocal microscopy were taken into consideration pre- and post-treatment. Interestingly, the plant concoction portrayed maximum effects in comparison to WDL alone. The study suggests E. prostrata and WDL as vital complementary adjuncts for anti-inflammasome mechanism in ENU-induced leukemia.

**Das C, Das D, Ghosh G, Bose A. Phytochemical profiling of Balarista formulation by GC-MS analysis. Nat Prod Res. 2022 Feb;36(3):843-848. doi: 10.1080/14786419.2020.1799364. Epub 2020 Aug 10.**

**PMID: 32772709**

### **Abstract:**

GC-MS analysis of different fractions of in-house Balarista formulation (IBF) and marketed Balarista formulations (M1, M2, M3 and M4) confirmed the presence of various active metabolites. The database of National Institute of Standards and Technology (NIST) library was used to identify these



compounds. This study revealed the presence of benzoic acid as a predominant compound in n-hexane fraction of M3 (94.69%), M2 (61.99%) and M4 (56.67%); ethyl acetate fraction of M2 (40.68%); methanol fraction of M2 (49.10%) and M3 (24.02%) formulations. Hexan-2-ol (72.49%); 3,3-Bis(4-hydroxy-3-methylphenyl)-1H-indol-2-one (71.40%); 5-(Hydroxymethyl)furan-2-carbaldehyde (64.52%); Propan-2-ol (57.34%); 1,3,3-Trimethyl-2-oxabicyclo[2.2.2]octane (52.35%); (2R,3S,4S,5R,6R)-2,3,4,5,6,7-Hexahydroxyheptanal (26.47%) are the other major compounds. Identification of benzoic acid in marketed formulations indicates indiscriminate use of sodium benzoate, which was determined as benzoic acid equivalents. Detection of benzoic acid at high concentration may affect the therapeutic efficacy of these formulations.

**Deshpande R, Prakash N S, Swaroop M, Muralimohan M, Shetty A. Randomised controlled trial to evaluate the effect of Gandhaka Rasayana rectal suppository in post operative pain management of ano-rectal disorders. J Ayurveda Integr Med. 2022 Feb 1:100485. doi: 10.1016/j.jaim.2021.07.001. Online ahead of print. PMID: 35120806**

#### **Abstract:**

**Background:** Poorly managed post-operative pain can lead to complications and prolonged rehabilitation. Pain Management after ano-rectal surgery becomes important as it could hamper day to day activities, disturb sleep, alter appetite and bowel evacuations and decrease the quality of life. According to Acharya Sushruta, pain (Shoola) cannot be produced without Vata dosha and Shoola (pain) is inevitable after Shastra (surgical) Karma (procedure) for which Basti (enema) is usually the management of choice. Rectal suppositories are one such dosage form that are extensively used in post-operative pain management especially after ano-rectal surgery.

**Materials and method:** In the study, a total of 40 patients who fulfilled the inclusion criteria were randomly divided to two groups A and B comprising of 20 patients each. Patients of Group A were treated with Gandhaka Rasayana rectal suppository and Group B were treated with Diclofenac Sodium rectal suppository for post-operative 5 days.

**Results:** The overall comparative results revealed a statistically significant improvement of 85% in Group A and 80.39% in Group B. Gandhaka Rasayana which is Tridoshashamaka, Vatamaya Nivaraka (ameliorates diseases caused by Vata dosha), Agnivardhaka (improves appetite and metabolism) and Shoolahara (reduces pain) attains micro particle size with 88 Bhavana (trituration) that can be readily absorbed by the rectal mucosa to exhibit the required therapeutic action.

**Conclusion:** The Bhavana Dravya (medium of trituration) used in the preparation of Gandhaka Rasayana have proven analgesic, anti-inflammatory, anti-bacterial action and is also said to promote wound healing. The present study reveals that there is significant effect of Gandhaka Rasayana rectal suppositories in managing post-operative pain of ano-rectal disorders.

**J J, P S, M AJ, R SP. Effect of Siddha Medicine Poorna chandirodayam and Gorojanai mathirai among Covid 19 Patients Suffering From Hypoxia: A Case Series. J Ayurveda Integr Med. 2022 Feb 2:100553. doi: 10.1016/j.jaim.2022.100553. Online ahead of print. PMID: 35125807**

**Abstract:**

Gold, sulphur and mercurial formulations in Indian alchemy are consumed in conjunction with suitable adjuvant for the better result of their synergistic action, reduced toxicity and consequently boosting their bioavailability via the body's cells due to their nano size resulting in improved effectiveness. *Poorna chandrodaya chendooram* is a well-known mercurial mixture containing gold and sulphur that has traditionally been used to treat a variety of diseases including tuberculosis, jaundice, fever, rat-bite, malignant ulcer, sprue, and male sterility. *Fel bovinum purifactum (Gorochnai)* is an expectorant. It is used to treat fever, nausea, dyspnea, general weakness, headache, and other symptoms in children. *Gorochnai* pill relieves asthma, hiccups, cough, and Hemiplegia. It acts as a bronchodilator. The second wave mutant virus has better transmission potential and a shorter incubation period than the first wave. Some diabetic patients treated for SARS-CoV-2 with high dose corticosteroids had a decrease in angioinvasive maxillofacial fungal infections (Mucormycosis). Without using synthetic steroids and with optimum oxygen support, this case report emphasises the therapeutic success of administering *Poorna chandirodayam* and *Gorojanai mathirai* together with herbal and herbomineral Siddha formulations as a supplementary when required in the early inflammatory phase of COVID-19 infection and hypoxic situation. 5 patients with the laboratory-confirmed diagnosis of coronavirus (SARS- CoV2) infection admitted in the approved Siddha Covid hospital have been involved in the study. When the drug is properly prepared and given in a safe dosage during the duration of treatment there will not be any side effects. Metal-based medications *Poorna chandirodayam* and *Gorojanai mathirai* been demonstrated through these case series to be safe and useful in COVID19.

**Teja PK, Mithiya J, Kate AS, Bairwa K, Chauthe SK. Herbal nanomedicines: Recent advancements, challenges, opportunities and regulatory overview. Phytomedicine. 2022 Feb;96:153890. doi: 10.1016/j.phymed.2021.153890. Epub 2021 Dec 17. PMID: 35026510**

**Abstract:**

**Background:** Herbal Nano Medicines (HNMs) are nano-sized medicine containing herbal drugs as extracts, enriched fractions or biomarker constituents. HNMs have certain advantages because of their increased bioavailability and reduced toxicities. There are very few literature reports that address the common challenges of herbal nanoformulations, such as selecting the type/class of nanoformulation for an extract or a phytochemical, selection and optimisation of preparation method and physicochemical parameters. Although researchers have shown more interest in this field in the last decade, there is still an urgent need for systematic analysis of HNMs.

**Purpose:** This review aims to provide the recent advancement in various herbal nanomedicines like polymeric herbal nanoparticles, solid lipid nanoparticles, phytosomes, nano-micelles, self-nano emulsifying drug delivery system, nanofibers, liposomes, dendrimers, ethosomes, nanoemulsion, nanosuspension, and carbon nanotube; their evaluation parameters, challenges, and opportunities. Additionally, regulatory aspects and future perspectives of herbal nanomedicines are also being covered to some extent.

**Methods:** The scientific data provided in this review article are retrieved by a thorough analysis of numerous research and review articles, textbooks, and patents searched using the electronic search tools like Sci-Finder, ScienceDirect, PubMed, Elsevier, Google Scholar, ACS, Medline Plus and Web of Science.

**Results:** In this review, the authors suggested the suitability of nanoformulation for a particular type of extracts or enriched fraction of phytoconstituents based on their solubility and permeability profile (similar to the BCS class of drugs). This review focuses on different strategies for optimising preparation methods for various HNMs to ensure reproducibility in context with all the physicochemical parameters like particle size, surface area, zeta potential, polydispersity index, entrapment efficiency, drug loading, and drug release, along with the consistent therapeutic index.

**Conclusion:** A combination of herbal medicine with nanotechnology can be an essential tool for the advancement of herbal medicine research with enhanced bioavailability and fewer toxicities. Despite the challenges related to traditional medicine's safe and effective use, there is huge scope for nanotechnology-based herbal medicines. Overall, it is well stabilized that herbal nanomedicines are safer, have higher bioavailability, and have enhanced therapeutic value than conventional herbal and synthetic drugs.

## YOGA

**Barrows J, Fleury J. Pilot randomized controlled trial of the Yoga for HEART intervention in community-dwelling older adults. *Geriatr Nurs.* 2022 Feb 21;44:184-191. doi: 10.1016/j.gerinurse.2022.02.003. Online ahead of print. PMID: 35217325**

### **Abstract:**

Physical activity reduces cardiovascular risk; however, many older adults do not engage in recommended levels. Theory-based interventions supporting motivation for physical activity are limited. This pilot study evaluated the feasibility of Yoga for Health Empowerment and Realizing Transformation (HEART), a theory-based intervention combining motivation and yoga-based physical activity. Feasibility was addressed as acceptability, demand, implementation fidelity, and limited efficacy in promoting physical activity, cardiovascular health, and mechanisms of action. Sedentary older adults (m = 65 years old, sd = 8.5) were randomized to Yoga for HEART (n=8) or Active Control (n=7) conditions. Yoga for HEART was: (a) acceptable, (b) retention 73%, (c) implemented as planned. A significant main effect for body mass index (BMI) was found in Yoga for HEART participants (p = .02). No significant effects were found for physical activity, other cardiovascular outcomes, or mechanisms of action. Yoga for HEART is feasible and recommended for further testing.

**Boybay Koyuncu S, Yayan EH. Effect of Postpartum Yoga on Breastfeeding Self-Efficacy and Maternal Attachment in Primiparous Mothers. *Breastfeed Med.* 2022 Feb 10. doi: 10.1089/bfm.2021.0320. Online ahead of print. PMID: 35143340**

### **Abstract:**

**Objective:** This study was conducted to determine the effect of yoga practice on the breastfeeding self-efficacy and maternal attachment of primiparous mothers in the postpartum period.

**Methods:** This study was performed in a quasi-experimental model with pretest and posttest control groups. The domain of the study was formed with women with 20-40-day-old babies enrolled in two Family Health Centers. One hundred and twenty-four women participated in the study. The Individual Identification Form, Breastfeeding Self-Efficacy Scale, and Maternal Attachment Scale were completed by the experimental and control groups. The experimental group engaged in 60 minutes of postpartum yoga practice 2 days a week for 8 weeks in the company of the researcher.

**Results:** After yoga practice, there was a statistically significant increase in the breastfeeding self-efficacy and improvement in the maternal attachment of the

experimental group ( $p < 0.05$ ). The corresponding increase and improvement of the mothers in the control group were less than those of the mothers in the experimental group ( $p < 0.05$ ).

**Conclusion:** This study finds that it is beneficial for both the mother's and the baby's physical and psychological health for health professionals to teach mothers to practice yoga, which positively affects breastfeeding and maternal attachment in the postpartum period.

**Danielli M, Gillies C, Thomas RC, Melford SE, Baker PN, Yates T et al. Effects of Supervised Exercise on the Development of Hypertensive Disorders of Pregnancy: A Systematic Review and Meta-Analysis. J Clin Med. 2022 Feb 1;11(3):793. doi: 10.3390/jcm11030793. PMID: 35160245**

**Abstract:**

Hypertensive disorders of pregnancy (HDP) are the most common medical complication in pregnancy, affecting approximately 10-15% of pregnancies worldwide. HDP are a major cause of maternal and perinatal morbidity and mortality, and each year, worldwide, around 70,000 mothers and 500,000 babies die because of HDP. Up-to-date high-quality systematic reviews quantifying the role of exercise and the risks of developing HDP are currently lacking. Physical exercise is considered to be safe and beneficial to pregnant women. Supervised exercise has been shown to be safe and to be more beneficial than unsupervised exercise in the general population, as well as during pregnancy in women with obesity and diabetes. Therefore, we undertook a systematic review and meta-analysis to investigate the effects of women performing supervised exercise during pregnancy compared to a control group (standard antenatal care or unsupervised exercise) on the development of HDP. We searched Medline, Embase, CINHAL, and the Cochrane Library, which were searched from inception to December 2021. We included only randomized controlled trials (RCTs) investigating the development of HDP compared to a control group (standard antenatal care or unsupervised exercise) in pregnant women performing supervised exercise. Two independent reviewers selected eligible trials for meta-analysis. Data collection and analyses were performed by two independent reviewers. The PROSPERO registration number is CRD42020176814. Of 6332 articles retrieved, 16 RCTs met the eligibility criteria, comparing a total of 5939 pregnant women (2904 pregnant women in the intervention group and 3035 controls). The risk for pregnant women to develop HDP was significantly reduced in the intervention compared to the control groups, with an estimated pooled cumulative incidence of developing HDP of 3% in the intervention groups (95% CI: 3 to 4) and of 5% in the control groups (95% CI: 5 to 6), and a pooled odds ratio (OR) comparing intervention to control of 0.54 (95% CI: 0.40 to 0.72,  $p < 0.001$ ). A combination of aerobic and anaerobic exercise, or yoga alone, had a greater beneficial effect compared to performing aerobic exercise only (mixed-OR = 0.50, 95% CI: 0.33 to 0.75,  $p = 0.001$ ; yoga-OR = 0.28, 95% CI: 0.13 to 0.58,  $p = 0.001$ ); aerobic exercise only-OR = 0.87, 95% CI: 0.55 to 1.37,  $p = 0.539$ ). Pregnancy is an opportunity for healthcare providers to

promote positive health activities, thus optimizing the health of pregnant women with potential short- and long-term benefits for both mother and child. This systematic review and meta-analysis support a beneficial effect of either structured exercise (combination of aerobic, strength, and flexibility workouts) or yoga for preventing the onset of HDP. Yoga, considered a low-impact physical activity, could be more acceptable and safer for women in pregnancy in reducing the risk of developing HDP.

**Estevao C. Role of yoga in inflammatory markers. Brain Behav Immun Health. 2022 Feb 1;20:100421. doi: 10.1016/j.bbih.2022.100421. eCollection 2022 Mar. PMID: 35199049**

**Abstract:**

Yoga is an ancient system for integrating the mind, body, and spirit. In the hatha yoga ashtanga tradition (the eight limb Patanjali Yoga), three of the limbs are meditation, breathwork (pranayama) and physical postures (asana), which are widely practised in yoga classes. The benefits of yoga for mental and physical health are rooted in the practice's origins: in yoga, stress is said to be the root of all diseases. The established fields of psychoneuroimmunology and immunopsychiatry study the interplay between the immune system and mood or mental states. This mini-review has shifted the emphasis from research that focuses on yoga's benefits for stress, the most commonly studied outcome of yoga research, to a summary of the research on the effects of yoga practices on the immune system. The current literature bears strong evidence for the benefits of yoga on the levels of circulating cortisol and classical inflammatory markers, such as C-reactive protein (CRP) and cytokines such as interleukin-1 beta (IL-1 $\beta$ ), interleukin 6 (IL-6), tumour necrosis factor-alpha (TNF- $\alpha$ ) and interferon-gamma (INF- $\gamma$ ). The evidence for other less studied markers, telomerase activity,  $\beta$ -endorphins, Immunoglobulin A (IgA) and brain-derived neurotrophic factor (BDNF) is also growing. This mini-review centres around the interplay between yoga and these markers in stress management and depression, vascular and immune function in the older population, cardiovascular and metabolic diseases, auto-immune diseases, breast cancer and pregnancy. Overall, the literature examined reveals the novelty of this field of research and sheds light on methodological challenges; however, it uncovers the potential for yoga to be used as adjuvant therapy in conditions with an inflammatory component.

**Hogstrom S, Philipson A, Ekstav L, Eriksson M, Fagerberg UL, Falk E et al. Dance and yoga reduced functional abdominal pain in young girls: A randomized controlled trial. Eur J Pain. 2022 Feb;26(2):336-348. doi: 10.1002/ejp.1862. Epub 2021 Sep 21. PMID: 34529293**

**Abstract:**

**Background:** Functional abdominal pain disorders (FAPDs) affect children, especially girls, all over the world. The evidence for existing treatments is mixed, and effective accessible treatments are needed. Dance, a rhythmic

cardio-respiratory activity, combined with yoga, which enhances relaxation and focus, may provide physiological and psychological benefits that could help to ease pain.

**Objectives:** The aim of this study was to evaluate the effect of a dance and yoga intervention on maximum abdominal pain in 9- to 13-year-old girls with FAPDs.

**Methods:** This study was a prospective randomized controlled trial with 121 participants recruited from outpatient clinics as well as the general public. The intervention group participated in dance and yoga twice weekly for 8 months; controls received standard care. Abdominal pain, as scored on the Faces Pain Scale-Revised, was recorded in a pain diary. A linear mixed model was used to estimate the outcomes and effect sizes.

**Results:** Dance and yoga were superior to standard health care alone, with a medium to high between-group effect size and significantly greater pain reduction ( $b = -1.29$ ,  $p = 0.002$ ) at the end of the intervention.

**Conclusions:** An intervention using dance and yoga is likely a feasible and beneficial complementary treatment to standard health care for 9- to 13-year-old girls with FAPDs.

**Significance:** FAPDs affect children, especially girls, all over the world. The negative consequences such as absence from school, high consumption of medical care and depression pose a considerable burden on children and their families and effective treatments are needed. This is the first study examining a combined dance/yoga intervention for young girls with FAPDs and the result showed a reduction of abdominal pain. These findings contribute with new evidence in the field of managing FAPDs in a vulnerable target group.

**Kirk MA, Taha B, Dang K, McCague H, Hatzinakos D, Katz J et al. Web-Based Cognitive Behavioral Therapy, Mindfulness Meditation, and Yoga Intervention for Posttraumatic Stress Disorder: Single-Arm Experimental Clinical Trial. JMIR Ment Health. 2022 Feb 28;9(2):e26479. doi: 10.2196/26479. PMID: 34499613**

**Abstract:**

**Background:** Posttraumatic stress disorder (PTSD) is a debilitating, undertreated condition. The web-based delivery of cognitive behavioral therapy supplemented with mindfulness meditation and yoga is a viable treatment that emphasizes self-directed daily practice.

**Objective:** This study aims to examine the effectiveness of a web-based cognitive behavioral therapy, mindfulness, and yoga (CBT-MY) program designed for daily use.

**Methods:** We conducted an 8-week, single-arm, experimental, registered clinical trial on adults reporting PTSD symptoms (n=22; aged 18-35 years). Each participant received web-based CBT-MY content and an hour of web-based counseling each week. Pre-post outcomes included self-reported PTSD symptom severity, depression, anxiety, chronic pain, and mindfulness. Pre-post psychophysiological outcomes included peak pupil dilation (PPD) and heart rate variability (HRV). HRV and PPD were also compared with cross-sectional data from a non-PTSD comparison group without a history of clinical mental health diagnoses and CBT-MY exposure (n=46).

**Results:** Pre-post intention-to-treat analyses revealed substantial improvements in PTSD severity (d=1.60), depression (d=0.83), anxiety (d=0.99), and mindfulness (d=0.88). Linear multilevel mixed models demonstrated a significant pre-post reduction in PPD (B=-0.06; SE=0.01; P<.001; d=0.90) but no significant pre-post change in HRV (P=.87). Overall, participants spent an average of 11.53 (SD 22.76) min/day on self-directed mindfulness practice.

**Conclusions:** Web-based CBT-MY was associated with clinically significant symptom reductions and significant PPD changes, suggesting healthier autonomic functioning. Future randomized controlled trials are needed to further examine the gains apparent in this single-arm study.

**Trial registration:** ClinicalTrials.gov NCT03684473;  
<https://clinicaltrials.gov/ct2/show/NCT03684473>.

**Kohl Heckl WK, Koch AK, Cramer H. Complementary medicine use in stroke survivors: a US nationally representative survey. BMC Complement Med Ther. 2022 Feb 12;22(1):41. doi: 10.1186/s12906-022-03525-0. PMID: 35151306**

### **Abstract:**

**Background:** Stroke is the second most common cause of death worldwide. Even after surviving, long-term rehabilitation often becomes necessary and does not always lead to complete recovery. Guidelines focus on prevention of risk factors and present concepts for rehabilitation after a stroke. Additional to these recommendations, complementary medicine (CM) utilization is common among patients with neurological conditions. CM also offers a wide range of therapies for both prevention and rehabilitation in stroke. There is limited information available on CM utilization among stroke survivors and differences to patients without former stroke diagnosis.

**Methods and results:** This analysis was based on data of the 2017 National Health Interview survey (NHIS, n = 26,742; response rate 80,7%). We analyzed the prevalence of consultations among stroke patients with CM practitioners within the last 12 months and reasons for utilization. 3.1% of participants reported a stroke, individuals without a prior stroke diagnosis were more likely to have used CM in the past 12 months (31.3% without versus 28.9% with stroke). Consultations with a chiropractor and of using mind-body-medicine was higher in individuals without stroke diagnosis, while more stroke survivors



had consulted a naturopath. Equal proportions had consulted a homeopath. Most common therapy approaches among stroke survivors were spiritual meditation (13.7%), progressive relaxation (5.4%), yoga (5.2%), mindfulness meditation (4.3%), mantra meditation (3.1%), guided imagery (2.6%) and tai chi (1.7%). CM use in stroke survivors was associated with female sex (adjusted odds ratio [AOR] = 2.12, 95% confidence interval [CI] = 1.56-2.88) and higher education (AOR = 1.94, CI = 1.42-2.65).

**Conclusion:** Stroke patients were less likely to take advantage of complementary medicine than the general population. Since there are many safe and beneficial options, stroke survivors might profit from better information about the existing possibilities regarding prevention and rehabilitation.

**Kwok JYY, Lee JJ, Choi EPH, Chau PH, Auyeung M. Stay mindfully active during the coronavirus pandemic: a feasibility study of mHealth-delivered mindfulness yoga program for people with Parkinson's disease. BMC Complement Med Ther. 2022 Feb 7;22(1):37. doi: 10.1186/s12906-022-03519-y. PMID: 35130894**

**Abstract:**

**Importance:** Patients with long-term neurological conditions, such as Parkinson's disease (PD), are particularly vulnerable to the public health measures taken to combat the COVID-19 pandemic. The inaccessibility of center-based rehabilitation further aggravated their motor dysfunctions as well as mental distress, leading to exacerbation of motor and non-motor symptoms, high healthcare utilization and worsened health-related quality of life (HRQOL).

**Objective:** This study aimed to evaluate the feasibility, safety, and preliminary effects of the mHealth-delivered home-based mindfulness yoga program on functional balance, motor symptoms, mental health and HRQOL in patients with PD.

**Design, setting and participants:** This prospective, single-arm, non-randomized feasibility study adopted a sequential explanatory mixed-method design. Adults (aged  $\geq 18$ ) with a clinical diagnosis of idiopathic Parkinson's disease (Hoehn and Yahr stage I to III) who were able to stand unaided and walk with or without an assistive device were enrolled via convenience sampling.

**Intervention:** Home-based mindfulness yoga training were delivered via video-conferencing software (Zoom) in eight bi-weekly 90-min sessions.

**Main outcomes and measures:** This current study measured functional balance, motor symptoms, perceived balance confidence, perceived freezing of gait symptoms, anxiety and depression, mindfulness and HRQOL using a tele-assessment approach at baseline and 1-week post-intervention. All participants were invited to attend qualitative individual interviews to explore their experience of using online mindfulness yoga program as a lifestyle intervention for PD rehabilitation.

**Results:** Among the ten patients, 80% completed the program with an adherence rate of 98.4%. All participants were able to learn and practice mindfulness yoga following the eight bi-weekly online mindfulness yoga training sessions, without any significant adverse events. Tele-assessment of outcomes were feasible and uneventful. Qualitative feedback revealed participants had a high preference of using the tele-rehabilitation approach to stay mindful and being active, both physically and socially, while confronting the changes brought by COVID-19 pandemic.

**Conclusions and relevance:** The mHealth-delivered home-based mindfulness yoga intervention was feasible, safe, and well-accepted among people with PD to relieve the burden brought by COVID-19 pandemic. Future studies should adopt a design with enhanced rigor, a comparison group, and enlarged sample size to evaluate the efficacy of the program in patients with long-term neurological conditions and/or physical impairments. We recommend a longer intervention duration of at least 8 weeks to enhance the psychophysiological effects.

**Martens NL. Yoga Interventions Involving Older Adults: Integrative Review. J Gerontol Nurs. 2022 Feb;48(2):43-52. doi: 10.3928/00989134-20220110-05. Epub 2022 Feb 1. PMID: 35103525**

**Abstract:**

There is growing scientific evidence that yoga interventions have positive impacts on health in community-dwelling older adults. Older adults are an exponentially growing cohort; efforts to improve their health can also contribute to community health. The objective of the current integrative review was to examine quantitative evidence concerning effectiveness of yoga interventions related to the health of community-dwelling older adults. Six studies met inclusion criteria of community-dwelling older adults, randomized controlled trial (RCT) design, and yoga intervention in the past 10 years. Hatha yoga was most frequently used; interventions were well-received with high adherence rates. Benefits from participation in yoga included improvements in psychological and physical health, such as reductions in anger, anxiety, and fear of falling, and increases in well-being, self-efficacy, improved executive and immunological function, strength, and balance. Findings reveal that additional well-designed yoga RCTs are indicated with longer intervention and follow up to assess lifespan changes. [Journal of Gerontological Nursing, 48(2), 43-52.

**McGuire D, Shannon A, Somaiya J, Brown E, O'Donoghue B. Pilot study of a yoga intervention for the treatment of anxiety in young people with early psychosis. Early Interv Psychiatry. 2022 Feb;16(2):200-204. doi: 10.1111/eip.13151. Epub 2021 Apr 30. PMID: 33929083**

**Abstract:**

**Background:** Anxiety is common in young people with early psychosis and treatment options for this co-morbidity remain limited. Yoga is a promising adjunct intervention that has been shown to reduce anxiety for adults with schizophrenia, therefore this pilot study evaluated the acceptability and potential effectiveness of yoga for anxiety in early psychosis.

**Methods:** A prospective single arm pilot study of a yoga intervention was conducted within an Early Intervention for psychosis service. Rates of attendance, as well as symptoms of anxiety pre and post yoga session were measured.

**Results:** A total of 14 young people participated in the study and over 70% attended half or more of the yoga sessions offered. Significant transient reduction in state anxiety after a single session of yoga was observed ( $p < 0.01$ ).

**Conclusions:** Yoga was found to be an acceptable and potentially effective adjunctive treatment for anxiety in early psychosis and the results warrant further clinical trials.

**Nalbant G, Lewis S, Chattopadhyay K. Characteristics of Yoga Providers and Their Sessions and Attendees in the UK: A Cross-Sectional Survey. Int J Environ Res Public Health. 2022 Feb 15;19(4):2212. doi: 10.3390/ijerph19042212. PMID: 35206399**

**Abstract:**

Yoga is an ancient Indian philosophy and way of life that is being used as a method of improving health and wellbeing. Evidence shows that yoga has several health benefits, such as managing many noncommunicable diseases, such as hypertension, and improving mental health. The popularity of yoga is growing in the UK, but it is mostly unregulated with little information available about yoga providers and their sessions and attendees. This study aimed to explore who is providing yoga; what sessions are available, where, and at what cost; and who attends these sessions in the UK and whether yoga providers were aware of health conditions in their sessions. A cross-sectional survey was undertaken among yoga providers in the UK. They were approached through four major UK yoga associations. In total, 407 yoga providers participated. Most providers were aged 45-64 years (69%), female (93%), and white (93%). The median number of group sessions and one-to-one sessions delivered per week was four and two, respectively. The most common styles were Hatha (28%), Iyengar (26%), and Vinyasa (15%). Sessions had a varying emphasis on different yogic practices, but 59% of providers allocated most time to yogic poses (asana), 18% to breathing practices (pranayama), and 12% to meditation (dhyana) and relaxation practices. Most (73%) reported that their attendees disclosed their health conditions to them, most commonly mental health issues (41%), hypertension (25%), and heart diseases (9%). This study showed that yoga sessions are widely available in the UK, often provided and practiced by women, and concentrate on yogic poses. Sessions concentrate on the asana and tend not to include many of the more holistic aspects of yoga that are

practiced in South Asian countries. Yoga providers are often aware of health conditions but may benefit from training to deliver sessions suitable for specific health conditions.

**Nemeroff R, Harden A, Kowalsky B. Yoga classes as an early intervention for college students reporting high levels of stress and anxiety: A pilot study. J Am Coll Health. 2022 Feb 14:1-7. doi: 10.1080/07448481.2021.2008401. Online ahead of print. PMID: 35157806**

**Abstract:**

**Background:** Today's college students are experiencing unprecedented rates of stress, anxiety, and mental health issues. As a result, college counseling centers are often overwhelmed by the demand for mental health services.

**Methods:** The current study evaluated the potential for Hatha yoga classes to be used as an alternative to conventional psychotherapy for college students reporting high levels of stress and anxiety.

**Results:** After 6 weeks of twice-weekly, hour-long yoga classes, significant reductions in stress, anxiety, pathological worry, and rumination were reported by 7 undergraduate college students.

**Conclusions:** Results of this pilot study suggest that Hatha yoga classes may serve as a widely accessible, cost-effective early intervention that can be offered as a first-line recommendation to students who are struggling with heightened levels of stress and anxiety.

**O'Dea D, Curtis J, Scully A, Lappin J. Pilot study of a mindfulness informed yoga intervention in young people with psychosis. Early Interv Psychiatry. 2022 Feb 1. doi: 10.1111/eip.13264. Online ahead of print. PMID: 35106933**

**Abstract:**

**Aim:** To determine the acceptability and safety of a mindfulness informed yoga intervention as adjunct to usual care for young people with early psychosis.

**Methods:** People aged 16-25 years attending a community-based specialist early psychosis clinic were invited to participate in a 12-week yoga intervention. The intervention consisted of 1-h weekly classes of mindfulness informed yoga. Acceptability was measured by uptake, attendance and participants' satisfaction. Safety was measured by incidence of physical injury, participants' level of comfort, distress and anxiety during the sessions, and the following mental health outcomes: positive and negative psychotic, depression, anxiety and stress symptoms, sleep quality and functioning.

**Results:** Of those who consented to the study, 80% (12) participated and on average attended 4.4 yoga classes. There were no physical injuries and

participants reported minimal distress and anxiety. Post-intervention, there was a significant reduction in anxiety symptoms and an improvement in function.

**Conclusions:** Mindfulness-based yoga interventions are both acceptable and safe as an intervention for youth with early psychosis. Though numbers were small, the study shows promise for yoga as a potentially useful intervention. Importantly, there was no deterioration in mental health outcomes. A larger trial evaluating clinical effectiveness is now timely.

**Papp ME, Berg C, Lindfors P, Wandell PE, Nygren Bonnier M. Experiences of physical activity and exercise among women with obstructive pulmonary disease. *Physiother Theory Pract.* 2022 Feb 28;1-11. doi: 10.1080/09593985.2022.2045658. Online ahead of print. PMID: 35225744**

**Abstract:**

**Background:** With more women being diagnosed with obstructive pulmonary disease, it is important to know how women experience non-pharmacological rehabilitation including different types of physical activity and exercise.

**Objective:** This study aimed to explore how women with obstructive pulmonary disease experienced participating in pulmonary rehabilitation including yoga or strength- and endurance training to promote physical activity. A second aim included exploring experiences of physical activity and exercise through life.

**Methods:** Fifteen women with asthma or chronic obstructive pulmonary disease were interviewed about their experiences of participating in an exercise intervention and about their experiences of physical activity and exercise in their lives. The transcribed interviews were analyzed using qualitative content analysis.

**Results:** An overall theme, "Wishing to succeed in attending physical activity and exercise," emerged. Three categories were identified: 1) strategies to overcome insecurity; 2) a life situation which enables and hinders; and 3) an inner drive and focus on myself.

**Conclusions:** The women's wishes to be physically active and exercise involved hindering and enabling factors. Specifically, their gender roles as women were described as a hinder. This suggests a need to include a gender perspective when promoting physical activity and exercise to women with obstructive pulmonary disease.

**Philip AC, Biju M. Yoga Therapy as an Adjuvant in Management of Asthma: Correspondence. *Indian J Pediatr.* 2022 Feb 28. doi: 10.1007/s12098-022-04107-1. Online ahead of print. PMID: 35226285**

**Philip AC, Biju M. Yoga Therapy as an Adjuvant in Management of Asthma: Correspondence. Indian J Pediatr. 2022 Feb 28. doi: 10.1007/s12098-022-04107-1. Online ahead of print. PMID: 35226285**

**Richmond D, Castro K, Rathod V, Dias TMDC, Filho NML, Meer J et al. Interrater Reliability of an Observational Rating Scale and Video Analysis of Yoga Poses. J Sport Rehabil. 2022 Feb 1;31(2):246-252. doi: 10.1123/jsr.2021-0056. Epub 2021 Sep 24. PMID: 34560666**

**Abstract:**

**Context:** Yoga is increasingly popular, not only as a form of recreational exercise but also as a physician-recommended intervention for health conditions. While serious adverse effects accompanying yoga practice are rare, poses that involve upper-extremity weight-bearing have a high risk of discomfort. To better understand factors contributing to adverse effects, there is a critical need for robust instruments that objectively evaluate pose performance. The purpose of this study was to assess the interrater reliability of an observational scale developed to assess the alignment of 3 yoga poses.

**Design:** Cross-sectional experimental study.

**Methods:** Thirty-eight individuals were given standardized instructions and performed 3 poses (Downward Dog, Plank, and Side Plank). Lateral videos were rated by 2 raters. A rating scale evaluating the alignment of 7 regions was developed by the study team with input from yoga teachers. Descriptive statistics were used to summarize the percentage of subjects showing ideal alignment and deviations. Interrater reliability was quantified using Cohen kappa coefficient ( $\kappa$ ).

**Results:** In Downward Dog, the prevalence of ideal alignment was 20%, 28%, and 37%, at the neck, shoulder, and back, respectively;  $\kappa$  ranged from .44 to .69. In Plank, the prevalence of ideal alignment was 31%, 45%, and 54% at the neck, shoulder, and back, respectively;  $\kappa$  ranged from .47 to .95. In Side Plank, the prevalence of ideal alignment was 16, 41%, and 24%, at the neck, shoulder, and back, respectively;  $\kappa$  ranged from .20 to .84.

**Conclusion:** The observational scale found a high prevalence of deviations, and demonstrated fair to substantial interrater agreement.

**RJ Schulz Heik, TJ Avery, B Jo, L Mahoney, PJ Bayley. Posttraumatic Stress Disorder Does Not Compromise Behavioral Pain Treatment: Secondary Analysis of a Randomized Clinical Trial Among Veterans. Glob Adv Health Med. 2022 Feb 16;11:21649561221075578. doi: 10.1177/21649561221075578. eCollection 2022. PMID: 35186445**

**Abstract:**

**Background:** Individuals with posttraumatic stress disorder (PTSD) and chronic pain evince different presentations, coping strategies, and treatment utilization patterns than individuals with chronic pain alone. Theorists have suggested that comorbid PTSD may complicate chronic pain treatment, and that integrated pain and PTSD treatment may be preferable to pain treatment alone.

**Objective:** Assess whether comorbid PTSD moderates Veterans' response to yoga and/or cognitive behavioral therapy (CBT) for pain.

**Methods:** Veterans with Gulf War illness ( $n = 75$ ) were assessed using the Brief Pain Inventory at baseline and posttreatment as part of a randomized clinical trial. PTSD status was abstracted from participants' medical records.

**Results:** PTSD+ participants ( $n = 41$ ) reported more pain at baseline than PTSD- participants ( $n = 34$ ;  $d = .66$ ,  $p < .01$ ). PTSD+ participants experienced more improvement in pain from baseline to posttreatment than PTSD- participants by a small to moderate, marginally statistically significant amount ( $d = .39$ ,  $p = .07$ ). The relationship between PTSD and treatment outcome was not moderated by treatment type (yoga vs CBT;  $p = .99$ ). Observation of treatment responses across PTSD status (+ vs -) and treatment (yoga vs CBT) revealed that PTSD+ participants responded well to yoga.

**Conclusion:** PTSD is not associated with reduced effectiveness of behavioral chronic pain treatment among Veterans with Gulf War illness. Therefore behavioral pain treatment should be made readily available to Veterans with pain and PTSD. Yoga deserves further consideration as a treatment for pain among individuals with PTSD.

**Sharma G, Ramakumar V, Sharique M, Bhatia R, Naik N, Mohanty S et al. Effect of Yoga on Clinical Outcomes and Quality of Life in Patients With Vasovagal Syncope (LIVE-Yoga). JACC Clin Electrophysiol. 2022 Feb;8(2):141-149. doi: 10.1016/j.jacep.2021.09.007. Epub 2021 Nov 24. PMID: 35210069**

**Abstract:**

**Objectives:** This study aims to determine the impact of yoga as an adjunct to standard therapy versus standard therapy alone on the symptomatic burden in patients with recurrent vasovagal syncope (VVS).

**Background:** There is a significant reduction in the quality of life (QoL) of patients with recurrent VVS. Existing management therapies have been largely ineffective. Recent trials have demonstrated the efficacy of yoga in diseases with autonomic imbalance, suggesting its possible utility in VVS.

**Methods:** Patients with recurrent VVS were randomized to receive either a specialized yoga training program in addition to current guideline-based therapy (intervention arm, group 1) or current guideline-based therapy alone

(control arm, group 2). The primary outcome was a composite of the number of episodes of syncope and presyncope at 12 months. Secondary outcomes included QoL assessment by World Health Organization Quality of Life Brief Field questionnaire (WHOQoL-BREF) scores and Syncope Functional Status Questionnaire scores at 12 months, head up tilt test, and heart rate variability at 6 weeks.

**Results:** A total of 55 patients underwent randomization. The mean number of syncopal or presyncopal events at 12 months was  $0.7 \pm 0.7$  in the intervention arm compared to  $2.52 \pm 1.93$  in the control arm ( $P < 0.01$ ). In the intervention arm, 13 (43.3%) patients remained free of events versus 4 (16.0%) patients in the control arm ( $P = 0.02$ ). QoL at 12 months showed significant improvement of all Syncope Functional Status Questionnaire scores and 2 domains of WHOQoL-BREF scores ( $P < 0.05$ ).

**Conclusions:** Yoga as adjunctive therapy is superior to standard therapy alone in reducing the symptomatic burden and improving QoL in patients with recurrent VVS.

**Sinclair KL, Kiser E, Ratcliff CG, Chaoul A, Hall MH, Rinpoche TW et al. Sleep moderates the effects of Tibetan yoga for women with breast cancer undergoing chemotherapy. Support Care Cancer. 2022 Feb 2. doi: 10.1007/s00520-022-06861-6. Online ahead of print. PMID: 35107599**

**Abstract:**

This study examined self-reported and actigraphy-assessed sleep and depression as moderators of the effect of a Tibetan yoga intervention on sleep and depression among women undergoing chemotherapy for breast cancer. This is a secondary analysis of an RCT examining a 4-session Tibetan yoga program (TYP;  $n = 74$ ) versus stretching program (STP;  $n = 68$ ) or usual care (UC;  $n = 85$ ) on self-reported sleep (Pittsburgh Sleep Quality Index (PSQI), actigraphy-assessed sleep efficiency (SE)) and depression (Centers for Epidemiological Studies Depression Scale; CES-D) for women undergoing chemotherapy for breast cancer. Data were collected at baseline and 1-week and 3-month post-intervention. Baseline PSQI, actigraphy-SE, and CES-D were examined as moderators of the effect of group on PSQI, actigraphy-SE, and CES-D 1 week and 3 months after treatment. There was a significant baseline actigraphy-SE  $\times$  group effect on PSQI at 1 week ( $p < .001$ ) and 3 months ( $p = .002$ ) and on CES-D at 3 months ( $p = .049$ ). Specifically, the negative association of baseline actigraphy-SE with subsequent PSQI and CES-D was buffered for women in the TYP and, to a lesser extent in STP, compared to those in the UC. Baseline PSQI and CES-D were not significant moderators of the effect of group on any outcome. Behaviorally assessed sleep may be a more robust indicator of which patients are most appropriate for a yoga intervention than self-reported sleep quality. Women with poor sleep efficiency may derive the greatest benefit in terms of sleep quality and mood from a yoga intervention.



**Rao BH, Gowlikar V, Vooturi S, Benditt DG, Rao HN, Surath M. "Tadasana" Yoga Maneuver for Preventing Vasovagal Syncope Recurrences: A Pilot Study. JACC Clin Electrophysiol. 2022 Feb;8(2):253-254. doi: 10.1016/j.jacep.2021.12.007. Epub 2022 Jan 31. PMID: 35210085**

**Susanti HD, Sonko I, Chang PC, Chuang YH, Chung MH. Effects of Yoga on Menopausal Symptoms and Sleep Quality across Menopause Statuses: A Randomized Controlled Trial. Nurs Health Sci. 2022 Feb 21. doi: 10.1111/nhs.12931. Online ahead of print. PMID: 35191141**

**Abstract:**

This randomized controlled trial investigated the effects of yoga on menopausal symptoms and sleep quality across menopause statuses. Participants were randomly assigned to either the intervention or control group (n = 104 each), and those in the intervention group practiced yoga for 20 weeks. The participants completed the following questionnaires: The Depression, Anxiety, and Stress Scale; Multidimensional Scale of Perceived Social Support; Menopause Rating Scale; and Pittsburgh Sleep Quality Index. The results revealed that yoga effectively decreased menopausal symptoms, with the strongest effects noted in postmenopausal women (mean  $\pm$  standard deviation: 14.98  $\pm$  7.10), followed by perimenopausal women (6.11  $\pm$  2.07). Yoga significantly improved sleep quality in postmenopausal and perimenopausal women after controlling for social support, depression, anxiety, stress, and menopausal symptoms (p < 0.001). However, yoga did not affect sleep quality in premenopausal women. Overall sleep quality significantly improved in postmenopausal (p < 0.001) and perimenopausal women (p < 0.001). Our data indicate that yoga can help decrease menopausal symptoms, particularly in perimenopausal and postmenopausal women, and improve their health.

**Tomlinson Perez S, Machaczek KK, Firth J, Pollard N, Meda G, Keddie E et al. Evaluation of the uptake, retention and effectiveness of exercise referral schemes for the management of mental health conditions in primary care: a systematic review. BMC Public Health. 2022 Feb 7;22(1):249. doi: 10.1186/s12889-022-12638-7. PMID: 35130844**

**Abstract:**

**Background:** Exercise is a recognised element of health-care management of mental-health conditions. In primary health care, it has been delivered through exercise referral schemes (ERS). The National Institute for Health and Care Excellence has highlighted uncertainty regarding the effectiveness of ERS in improving exercise participation and health outcomes among those referred for mental-health reasons. This review aims, therefore, to evaluate ERSs for individuals who are referred specifically for mental-health reasons.

**Methods:** Studies were reviewed that assessed the effectiveness of ERSs in improving initiation of and/or adherence to exercise and/or their effectiveness in improving long-term participation in exercise and health outcomes among

primary care patients who had been referred to the scheme for mental-health reasons. The data were extracted and their quality assessed. Data were analysed through a narrative synthesis approach.

**Results:** Nine studies met the eligibility criteria. Three assessed clinical effectiveness of the schemes, eight assessed ERS uptake and/or adherence to the exercise schedule, and two assessed the impact of the ERSs on long-term exercise levels. In one study, it was found that ERSs that were based in leisure centres significantly improved long-term symptoms in those who had been referred due to their mental ill health ( $P < 0.05$ ). ERSs that involved face-to-face consultations and telephone calls had the highest rates of mean uptake (91.5%) and adherence (71.7%), but a difference was observed between uptake/adherence in trials (86.8%/55.3%) and in routine practice (57.9%/37.2%). ERSs that included face-to-face consultations and telephone calls increased the amount of long-term physical activity that was undertaken by people who had been referred for mental-health reasons ( $P = 0.003$ ).

**Conclusions:** Uptake and effectiveness of ERSs for mental health conditions was related to programme content and setting with more effective programmes providing both face-to-face and telephone consultations. Good uptake of yoga among those referred for mental health reasons suggests that mindful exercise options should be investigated further. Existing ERSs could be improved through application of individual tailoring and the provision of more face-to-face consultations, and social support. Further research is required to identify the types of ERSs that are most clinically effective for those with mental ill health.

**Tornoczky GJ, Rozsa S, Nagy H, Banhidi M. Perceived usefulness of yoga to maintain well-being and in relation to COVID-19 cases among Hungarian yoga practitioners. J Sports Med Phys Fitness. 2022 Feb 18. doi: 10.23736/S0022-4707.22.13341-4. Online ahead of print. PMID: 35179328**

**Abstract:**

**Background:** The present COVID-19 epidemic has had a considerable impact on the mental health of individuals worldwide. Research projects suggests potential benefits of yoga practice for prevention, or as medical supplementation in relation to the present pandemic. This study investigated the association between yoga and health status, and how the frequency of yoga practice affected the mental well-being (MWB) of the respondents.

**Methods:** Hungarian yoga practitioners ( $N = 379$ ) aged 20 to 75 years (93.4% female) were asked about their personal health, perceived usefulness of yoga practice for COVID-19 cases and their MWB. Data were collected between April 17 and May 17, 2021. The measurement tool used was an online questionnaire including sociodemographic data, characteristics of yoga practice, COVID-19 and health related questions, and WHO Well-being Index (WBI-5). Associations were examined through ANOVA and Chi-square tests.

**Results:** There was a significant difference among the yoga practice groups by weekly frequency (once a week, 2-3 times a week, 4-5 times a week, daily) on the total mean score of well-being (WBI-5),  $F(3, 373) = 12.97$ ,  $p < 0.001$ ,  $\eta^2 = 0.094$ . The daily practice of yoga showed the highest MWB.

**Conclusions:** According to our findings, it can be stated that regular yoga practice is associated with higher level of MWB which can be successful in dealing with COVID-19 issues such as stress and depression.

**Unick JL, Dunsiger SI, Bock BC, Sherman SA, Braun TD, Wing RR. Preliminary investigation of yoga as an intervention approach for improving long-term weight loss: A randomized trial. PLoS One. 2022 Feb 4;17(2):e0263405. doi: 10.1371/journal.pone.0263405. eCollection 2022. PMID: 35120162**

**Abstract:**

**Objective:** Yoga targets psychological processes which may be important for long-term weight loss (WL). This study is the first to examine the feasibility, acceptability, and preliminary efficacy of yoga within a weight management program following WL treatment.

**Methods:** 60 women with overweight or obesity ( $34.3 \pm 3.9$  kg/m<sup>2</sup>,  $48.1 \pm 10.1$  years) were randomized to receive a 12-week yoga intervention (2x/week; YOGA) or a structurally equivalent control (cooking/nutrition classes; CON), following a 3-month behavioral WL program. Feasibility (attendance, adherence, retention) and acceptability (program satisfaction ratings) were assessed. Treatment groups were compared on weight change, mindfulness, distress tolerance, stress, affect, and self-compassion at 6 months. Initial WL (3-mo WL) was evaluated as a potential moderator.

**Results:** Attendance, retention, and program satisfaction ratings of yoga were high. Treatment groups did not differ on WL or psychological constructs (with exception of one mindfulness subscale) at 6 months. However, among those with high initial WL ( $\geq 5\%$ ), YOGA lost significantly more weight ( $-9.0$ kg vs.  $-6.7$ kg) at 6 months and resulted in greater distress tolerance, mindfulness, and self-compassion and lower negative affect, compared to CON.

**Conclusions:** Study findings provide preliminary support for yoga as a potential strategy for improving long-term WL among those losing  $\geq 5\%$  in standard behavioral treatment.

**Uyaroglu AK, Ergin E, Tosun AS, Erdem O. Cross-sectional study of social media addiction and social and emotional loneliness in university students in Turkey. Perspect Psychiatr Care. 2022 Feb 13. doi: 10.1111/ppc.13056. Online ahead of print. PMID: 35152424**

**Abstract:**

**Purpose:** This study investigates the relationships between social media addiction and social and emotional loneliness in university students.

**Methods:** This is a descriptive, correlational study. Data were collected from 555 university students. The study data were then collected through an online survey. The data were analyzed using the descriptive statistics, Mann-Whitney U test, the Kruskal Wallis analysis, and Spearman correlation.

**Results:** Higher and statistically significant levels of loneliness were found in males, single students, students displaying poor academic performance, and learners who perceived their economic situation as worse than the other groups ( $p \leq 0.005$ ). A positive and significant relationship association was noted between the aggregate social media scores of students and their total loneliness scores ( $r = 0.196$   $p = 0.000$ ) ( $p < 0.05$ ).

**Practice implications:** Social skills training should be provided to young social media users. Young people should be offered social support resources and ways to reduce loneliness, such as listening to music, exercising, and doing yoga.

**Wang X, Cai ZD, Jiang WT, Fang YY, Sun WX, Wang X. Systematic review and meta-analysis of the effects of exercise on depression in adolescents. Child Adolesc Psychiatry Ment Health. 2022 Feb 28;16(1):16. doi: 10.1186/s13034-022-00453-2. PMID: 35227300**

**Abstract:**

**Background:** Depression is widespread among adolescents and seriously endangers their quality of life and academic performance. Developing strategies for adolescent depression has important public health implications. No systematic review on the effectiveness of physical exercise for adolescents aged 12-18 years with depression or depressive symptoms has previously been conducted. This study aims to systematically evaluate the effect of physical exercise on adolescent depression in the hope of developing optimum physical exercise programs.

**Methods:** Nine major databases at home and abroad were searched to retrieve randomized controlled trials (RCTs) on exercise interventions among adolescents with depression or depressive symptoms. The retrieval period started from the founding date of each database to May 1, 2021. The methodological quality of the included articles was evaluated using the modified PEDro scale. A meta-analysis, subgroup analysis, sensitivity analysis, and publication bias tests were then conducted.

**Results:** Fifteen articles, involving 19 comparisons, with a sample size of 1331, were included. Physical exercise significantly reduced adolescent depression (standardized mean difference [SMD] = - 0.64, 95% CI - 0.89, - 0.39,  $p < 0.01$ ), with a moderate effect size, in both adolescents with depression (SMD = -0.57,

95% CI - 0.90, - 0.23,  $p < 0.01$ ) and adolescents with depressive symptoms (SMD = - 0.67, 95% CI - 1.00, - 0.33,  $p < 0.01$ ). In subgroups of different depression categories (depression or depressive symptoms), aerobic exercise was the main form of exercise for the treatment of adolescents with depression. For adolescents with depression, interventions lasting 6 weeks, 30 min/time, and 4 times/week had optimum results. The effects of aerobic exercise and resistance + aerobic exercise in the subgroup of adolescents with depressive symptoms were significant, while the effect of physical and mental exercise (yoga) was not significant. For adolescents with depressive symptoms, aerobic exercise lasting 8 weeks, 75-120 min/time, and 3 times/week had optimum results. Physical exercise with moderate intensity is a better choice for adolescents with depression and depressive symptoms.

**Conclusions:** Physical exercise has a positive effect on the improvement of depression in adolescents. The protocol for this study was registered with INPLASY (202170013). DOI number is 10.37766/inplasy2021.7.0013. Registration Date:2021.7.06.

**Yilmaz Esencan T, Rathfisch G. Effects of Yoga and Meditation on the Birth Process. Altern Ther Health Med. 2022 Feb 25:AT7108. Online ahead of print. PMID: 35212645**

**Abstract:**

**Context:** During labor, conscious maternal expulsive efforts are crucial, especially in the second stage. Contemporarily, medical professional's bedside observations indicate an inadequacy in the maternal contribution to the process of delivery that has led to increased rates of caesarean sections and interventional deliveries. For that reason, the importance of yoga, meditation, and breath-awareness practices increases during pregnancy and birth.

**Objective:** The study intended to examine the impact on the delivery process of the practice of yoga and meditation during pregnancy and labor.

**Design:** The research team designed a randomized controlled trial.

**Setting:** The research was conducted between October 2016 and May 2018 at an educational and research hospital in Istanbul, Turkey, on the Anatolian side of the Istanbul province.

**Participants:** Participants were 90 primiparous pregnant women who applied to the pregnancy school at the hospital and who met the criteria for acceptance into the study.

**Intervention:** The participants was randomly divided into two groups, 30 in an intervention group and 60 in a control group. The intervention group performed yoga and meditation for 60 minutes two times a week for 10 weeks. Yoga and meditation practices also occurred during the course of labor for the

intervention group. Routine midwifery care was given to both groups during labor.

**Outcome measures:** The data were collected using: (1) the State Trait Anxiety Inventory (STAI), (2) the Wijma Delivery Expectancy/Experience Questionnaire A, (3) the Childbirth Self-Efficacy Scale (CBSEI) Short Form, (4) the Wijma Delivery Expectancy/Experience Questionnaire Version B, and (5) a visual analogue scale (VAS) for pain.

**Results:** When the labor data were evaluated, the intervention group had statistically higher vaginal delivery rates, lower labor intervention rates and episiotomy opening frequencies, lower pain measurement scores and WIJMA B scores, and higher CBSEI scores than the control group. However, the intervention group's STAI scores had increased significantly after the practice post intervention.

**Conclusions:** Yoga and meditation are effective methods for reducing pain and fear perception and increasing self-efficacy and vaginal delivery rates during the labor process.