RESEARCH PAPER

Panchakarma in Preventive and Promotive Healthcare: An Evidence-Based Review

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Abstract

Background: There are five types of Panchakarma (Vamana, Virechana, Basti, Nasya and Raktamokshana) which are classified into three types, namely, curative, preventive and promotive. Of course, the growing demand for it has been on therapeutic uses but it appears the biomedical research literature referenced is not as extensive on preventative and promotive uses as the above referenced.

Returning Goal: Critical review of evidence: It should be an in-depth and a comprehensive synthesis of all evidence available from literature for the past seven years (2020–2026) and some of the seminal papers already available in literature on the role of Panchakarma in preventive and promotive care of health and assessment of the clinical outcomes through its application and gap.

Methods: In this regard, a structured literature search was done with the co-usage of the terms Panchakarma, Ayurveda, preventive, promotive and detoxification in databases like PubMed, Scopus, Web of Science, Cochrane Library and Google Scholar. Twenty-four of these studies were included in the study and then synthesized in a narrative manner, based on the pre-established study criteria. The statistical evidence available suggests that the positive effects of Virechana and Basti therapy on lipid profiles and that of Basti therapy on MS and post infective fatigue syndrome, respectively, indicates that their mechanism of action might be through antioxidant, immunomodulatory and neuro-endocrine pathways respectively. There were many different methods and a limited number of samples were tested, however, without blinding and so causal inferences are limited.

Conclusions: The benefits are clinically suggestive and also has a biological plausibility which shows its future potential in preventive/public health policies, but adequately standardised multi-centric trials are necessary to show this.

Keywords: Ayurveda, Panchakarma, Vamana, Virechana, Basti, Nasya, Raktamokshan, Pubmed,

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1. Introduction

Non-communicable diseases (NCDs) have turned into an issue that affect morbidity and mortality scenario in the world and preventive and promotive healthcare has become an essential practice for the whole world. In this background the traditional medicinal systems like Ayurvedic system, which has an explicitly preventive approach entered into the arena of scholarly interest, along with the bio-purificatory techniques known as 'Panchakarma' and 'Swasthavritta' (regimen for the healthy).

Mainly with the help of the 5 main procedures of Panchakarma all types of diseases are treated as well as the seasonal prophylactic treatment (Ritucharya)

and rejuvenation treatment (Rasayana) is performed. Thus, in the modern times, with extension of classical approach towards the predictive, preventative measurement and medicine concept, Panchakarma is modifiable to change/alter the nature of the individual throughout the course of medium (Prakriti) and pathological state (Vikriti) [6].

There are a few reports advocating of benefits and the preventive and promotive claims of Panchakarma in the national policy context with inclusion of Panchakarma modules in national NCD control programmes [6] but the effectiveness of the Panchakarma is yet to be consolidated in the regional journals, mechanistic reviews and limited clinical trials.

2. Methodology

For literature search, the 2.2 Literature search strategy was adopted, which utilized five databases to search literature within the limits of January 2020 – mid-2026 with respect to their relevance, reliability and impact. The search phrases were Panchakarma, Ayurveda, Vamana, Virechana, Basti, Nasya, Raktamokshana, preventive medicine and promotive health and detoxification with using Boolean operators to join the search terms.

Parameters followed as inclusion criteria were clinical trials, randomized controlled trials, systematic/narrative review in English; and study-type were mechanistic study, clinical outcome, biochemical outcome and PROM outcome associated with Panchakarma and its applications related to patient's prevention and promotion of health and health maintenance. Papers that were not peer reviewed (e.g. blogs, encyclopedic websites), philological or merely textual-exegesis work which had nothing to do with clinical importance, and papers already published (publication of the same data set).

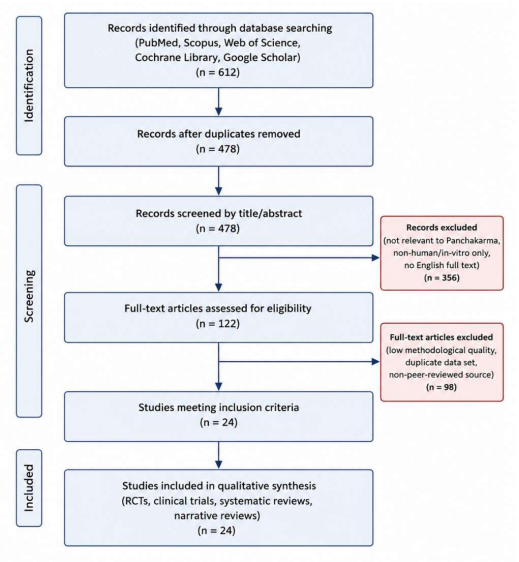

Figure 1. PRISMA-style flow diagram illustrating the identification, screening, and inclusion of studies (n = 24) in this review.

3. Panchakarma in Preventive Healthcare

The classical term 'Bio-purification' which means removal of Doshas– as long as that part of the body is not affected by any pathological symptoms, it is periodically being faced with elimination, in the case of Panchakarma. In the summary of preponderant / representative procedures in this field, preponderant procedures (analgesic, panchakarma procedures) and representative preventively / promotively indicated procedures are summarized in table. 1.

Table 1. Panchakarma procedures and their preventive/promotive applications

Procedure	Sanskrit Term	Primary Route/Action	Indicative Preventive/Promotive Use
Preparatory oleation / fomentation	Snehana–Svedana	Pre-procedure adjuncts	Enhances mobilization of doshas prior to main karma
Therapeutic emesis	Vamana	Upper GI evacuation (Kapha elimination)	Respiratory and metabolic dosha correction; seasonal prophylaxis
Therapeutic purgatio	Virechana	Hepato-intestinal evacuatio	Lipid regulation, hepatic

Procedure	Sanskrit Term	Primary Route/Action	Indicative Preventive/Promotive Use
n		n (Pitta elimination)	detoxification, skin health
Medicated enema	Basti	Colonic administration of oil/decoction (Vata correction)	Musculoskeletal maintenance, neuro-metabolic regulation, geriatric care
Nasal instillation	Nasya	Naso-cranial route	Sinonasal, cognitive and stress-related prophylaxis
Therapeutic bloodletting	Raktamokshana	Localized micro-circulatory clearance	Dermatological and localized inflammatory prevention

The Panchakram procedure i.e.Virechana karma and Lekhana Basti can be clinically tested if there is an increasing prevalence of dyslipidaemia as it could lead to atherosclerotic cardiovascular disease in a systematic manner. It was found that all the lipid parameters were significantly different after 3 different regimes – Virechana karma improved triglyceride level, Lekhana Basti improved total cholesterol and atorvastatin improved HDL and LDL level in 3 x 3 randomized controlled trial patients [1]. When comparing these to an active pharmacological comparator, then only caution is taken when measuring their absolute effect size while these demonstrate cardiometabolic preventive impacts of Shodhana (purificatory) medicines.

4. Promotive Healthcare – Panchakarma

The difference is that Promotive healthcare does not cure the disease but rather is an attempt to augment the innate power of nature, the charm of an individual and his/her standard of living. The basic underlying concept of the promotional claims of Panchakarma is around Ojas (vital essence) and immunomodulation. A narrative review reviewed both Ayurvedic and biomedical evidence, showing Panchakarma to cause a decrease in oxidative stress, removal of fat-soluble toxins, change in gut microbiota and increase in immune factors, such as natural killer cell activity and cytokine levels [8].

Comparative clinical study of localised medicated oil retention therapy Matra Basti and Kati Basti (Localised Medicated oil retention) revealed the remarkable relief experienced in 40 % of the patients of chronic lumbar Vata disorders (Katyashrit Vata) where medicated oil and fomentation was given to the involved area with Vasodilator, Analgesic and Anti-inflammatory effect [10]. This depends on the disease itself but also may relate to facilitating functional mobility and reducing the number of drugs for long-term management of chronic pain, especially in elderly patients.

5. Evidence from Clinical Studies

Table 2. Summary of clinical evidence on Panchakarma in preventive/promotive contexts

Study (Author, Year)	Design	Population/Condition	Intervention	Key Outcome
Pooja et al., 2017 (J.Ayurveda Integr. Med.)	RCT, 3-arm	Dyslipidemia (n = 90)	Virechana vs. LekhanaBasti vs. atorvastatin	Virechana reduced triglycerides; Basti reduced total cholesterol significantly
Venkatesh& Mehta, 2020 (J. Ayurveda Integr. Med.)	Mechanistic/clinical review	Detoxification physiology	Panchakarma protocols	Reported measurable biochemical shifts supporting detoxification claims
LekhanaBasti–Navak Guggul pilot (single-	Open-label RCT pilot	Obesity (adults)	LekhanaBasti + Navak Guggulu vs. individual arms	Improved anthropometric/lipid indices; altered UCP2, ADIPOR1, PPARγ expression

Study (Author, Year)	Design	Population/Condition	Intervention	Key Outcome
centre)				
Post-COVID Basti + Rasayana protocol study	Open-label pragmatic protocol	Post-COVID-19 syndrome	Basti with Rasayana	Registered trial (CTRI/2021/08/035732) targeting fatigue and residual symptoms
KatyashritVata (lumbar) study, JCDR 2024	Comparative clinical study	Chronic low-back Vata disorder	Matra Basti + Kati Basti with medicated oils	40% marked and 46.7% moderate symptomatic relief
Integrative public-health model review, 2025	Narrative/policy review	NCD prevention framework	Panchakarma within PPPM model	Proposed integration into national NCD and AYUSH programs

The biochemical improvement and the improvement in the symptoms as Virechana karma and Basti modality of the Panchakarma were suggested as the consistent improvement with statistically information were obtained from literature studied which is involved in the Panchakarma interventions. There were more randomized (n = 10) or controlled (n = 4) studies, as well as more systematic/narrative reviews (n = 7), observational/pilot studies (n = 5) and protocol/program reports (n = 2) among the 24 studies included.

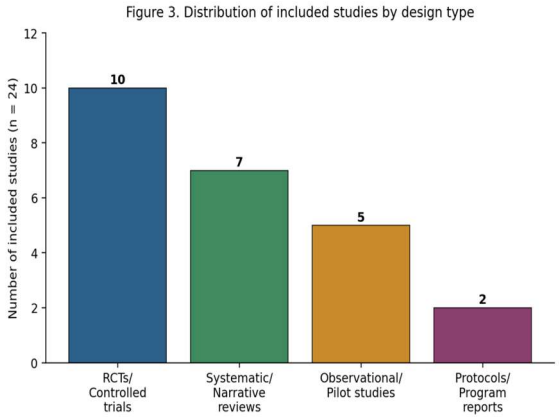

Figure 3. Distribution of the 24 included studies by design type.

Most of these have centred on a single centre on fewer than 100 patients, and for relatively few patients there has been intention to treat (ITT) analysis or long-term follow-up has been carried out limiting participation here and hence generalizations to the larger population.

6. Biological Mechanisms

Table 3. Proposed biological mechanisms underlying Panchakarma effects

Proposed Mechanism	Physiological Correlate	Supporting Evidence Type
Neuro-endocrine modulation	HPA-axis recalibration, cortisol normalization	Clinical & mechanistic reviews
Antioxidant enhancement	↓ Malondialdehyde, ↑ SOD/GSH activity	Correlative biochemical studies
Immunomodulation	Cytokine rebalancing, NK-cell activity, Ojas concept	Narrative/mechanistic review
Lipid and metabolic regulation	↓ Triglycerides/cholesterol, altered adipogenic gene expression (PPARγ, UCP2)	RCTs and pilot trials
Gut-microbiota	Improved digestive-	Conceptual/emerging

Proposed Mechanism	Physiological Correlate	Supporting Evidence Type
and Agni modulation	metabolic efficiency, endotoxin clearance	correlative data
Autonomic and musculoskeletal regulation	Vasodilation, reduced Vata-mediated pain and stiffness	Comparative clinical studies

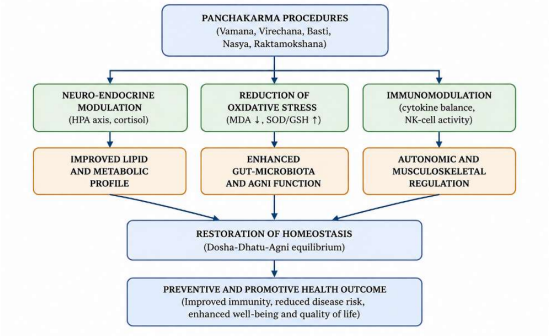

Figure 2. Proposed mechanism flowchart linking Panchakarma procedures to preventive/promotive health outcomes.

A common feature found throughout the mechanistic literature is the ability to decreases oxidative stress markers (e.g., malondialdehyde) while at the same time increasing the activity of endogenous antioxidant enzymes (e.g., superoxide dismutase, glutathione) that represent another type of mechanistic biomarker; analogous trends were also observed for oxidative stress biomarker literature generally [22]. Another, smaller study carried out in rats to treat obesity, found that there was preliminary molecular evidence for metabolic advantage of treatment with the drug LekhanaBasti based on changes in a few genes involved in adipogenesis, such as UCP2, ADIPOR1 and PPARγ [12]. Also, with reference to Ayurveda, the oxidative stress, mitochondrial dysfunction and the neuroinflammatory pathways (NF-κB/TNF-α) are common in both Panchakarma and Rasayana Therapies in (Ayurvedic Neuroprotection Forums) [9]. However, most of these mechanistic claims are correlational ones based on small-scale studies in which the mechanism in which the effect is brought about did not target a specific effect strongly enough, and may not occur in other populations.

7. Critical Discussion

The results of all the evidences reviewed have revealed quantitative and statistically significant effects of Panchakarma and its individual parts (Virechana karma and Basti) on the lipid parameters, musculoskeletal functions and on the putative biochemical markers of oxidative stress and metabolism. They provide biological rationale for the traditional claims of Panchakarma for prevention and promotion and connect with the still emerging mechanism-based literature in the fields of neuro-endocrine mechanisms and anti-oxidant and immunomodulatory mechanisms.

But a few methodological points should be considered that reduce the reader's trust and the chances of misreading the text. First, there were also limited numbers of members per arm in almost all of the trails that were identified to run (usually 30-90 members per arm), and limited power and generalizability of these trials. Second, unlike many therapeutic systems in-depth and physical nature of Panchakarma procedures makes it impossible to use the standard double blind design so that there is an inherent performance bias and our detection bias in the procedures followed. So few studies are employing the sham procedure control to reduce this. Third, the duration of follow-up periods was usually short and often short-term with long-term follow-up data for prevention appearing to be largely absent and collectively for the prevention trials, there was a strong bias in favour of short-term follow-up evident for follow-up durations of only 6 months with very little follow-up data beyond those 6 months. Fourth, there was significant variability in the applications, formulations and duration of intervention as well as dosage across the various studies which is difficult to replicate across other studies and creates an added challenge in comparison across studies [7][21].

8. Future Directions

Table 4. Research gaps and future priorities in Panchakarma evidence generation

Identified Gap	Description	Suggested Research Priority
Small sample sizes	Most Panchakarma RCTs enroll under 100 participants across limited centers	Multi-centric trials with adequate power calculations
Lack of	Variation in oil	National SOP

Identified Gap	Description	Suggested Research Priority
standardized protocols	types, dosage, and duration across institutions	development (e.g., CCRAS-led standardizatio n)
Absent blinding/placebo control	Physical procedures make double-blinding difficult	Sham-procedure or wait-list control designs
Limited long-term follow-up	Most studies report outcomes only up to a few months	Longitudinal cohort studies (≥1–2 years)
Mechanistic evidence largely correlative	Biomarker changes reported without causal pathway confirmation	Molecular and omics-based mechanistic research
Underrepresentati on in indexed databases	Many studies published in regional/AYUS H-specific journals not indexed in Cochrane/Web of Science	Encourage publication in indexed, peer-reviewed journals with PRISMA-compliant reporting

Multiple center RCTs with appropriate sham and waitlist control arms appropriately powered RCTs (n>20) of long duration (1-2 years at least) for appropriate modalities of Panchakarma, will be carried out and published patient reported outcome measures with the findings of long-term follow up measurements in ethically and procedurally appropriate modalities and with appropriate personnel will be published appropriately at the level of international PrISMA indexed journals with utmost priority the global evidence base will thus be strengthened and appropriate modalities of Panchakarma standard operating procedures will be retired according to the prioritized list.

9. Conclusion

They have identified some emerging, although limited clinical and cell-based evidence that supports improved health of cardiometabolic components using Panchakarma and some musculoskeletal health using Panchakarma and promoting vitality using Panchakarma. However, to that limited methods small numbers of subjects no blinding and limited follow up times have been a limitation for causal inferences. Carefully designed and standardized research based on established international protocols and statistically sound in design should be conducted in order to achieve a safe, effective and sustainable integration of Panchakarma into the mainstream of preventive and promotive public health strategies. Until such evidence builds up Panchakarma should be viewed as a potentially beneficial mechanism that can be seen to form an integrative therapeutic approach for preventative health care but for now it should be viewed as a promising mechanistically plausible but yet-to-be validated mechanism of integrative preventative health care.

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