

Integrative Protocols for Respiratory Disorders

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ABSTRACT

Chronic respiratory disease, covering bronchial asthma, COPD, allergic rhinitis and chronic cough, affects approximately 15% of European adults and produces a substantial proportion of the chronic symptom burden that integrative-medicine services see. Conventional management is effective for most patients but leaves meaningful gaps: inhaler dependence concerns, incomplete symptom control on maximal pharmacotherapy in a subset of patients, variable control of the functional limitation and quality-of-life dimensions that matter most to patients, and the growing post-COVID respiratory sequelae population that conventional protocols were not designed for. Ayurvedic medicine has engaged with respiratory disorders under the classical categories Tamaka Shwasa (asthma), Kasa (cough), Vatika Pratishyaya (rhinitis) and related diagnostic patterns for centuries. This review covers 64 primary clinical and observational studies published between 2005 and 2021 evaluating Ayurvedic and integrative protocols in respiratory disorders, grouped under five approach frames: R1 (single-herb respiratory therapy), R2 (classical polyherbal formulations), R3 (Panchakarma procedures for respiratory indications), R4 (yoga and pranayama-based integrative protocols), and R5 (multi-component integrated protocols combining conventional and Ayurvedic components). Each frame was scored with the Respiratory Response Index (RRI). Multi-component integrated protocols (R5) produced the highest RRI at 0.846, followed by yoga and pranayama protocols (R4) at 0.812 and classical polyherbal formulations (R2) at 0.798.

Keywords: respiratory disorders; bronchial asthma; COPD; allergic rhinitis; Ayurveda; Tamaka Shwasa; pranayama; Sitopaladi; Vasa; integrative respiratory medicine; post-COVID respiratory; RRI

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1. Introduction

1.1 Respiratory Disease Burden and the Integrative-Medicine Role

Chronic respiratory disease has a particular weight in integrative-medicine practice because its symptoms are persistent, its functional consequences are visible to patients every day, and its conventional management has meaningful gaps that integrative approaches can plausibly address. Bronchial asthma affects roughly 8% of European adults with another 4-5% in COPD, plus substantial additional burden in allergic rhinitis and chronic cough. Standard management with inhaled corticosteroids, long-acting beta-agonists, leukotriene receptor antagonists and related pharmacotherapy is effective for most patients most of the time, but a meaningful minority have incomplete control on maximal therapy, inhaler tolerance issues, or functional limitation that does not improve adequately with pharmacological management alone. The post-COVID respiratory sequelae population adds a newer and growing need: conventional protocols were not designed for the distinctive symptom profile of long-COVID respiratory presentations, and integrative approaches have attracted particular interest in this group.

1.2 Ayurvedic Respiratory Repertoire and Study Objectives

Ayurvedic medicine has an extensive engagement with respiratory disease. Classical categories Tamaka Shwasa (asthma with primarily nocturnal wheezing), Kasa (cough in five subtypes), and Vatika Pratishyaya (rhinitis) correspond reasonably closely to modern respiratory diagnoses, and the therapeutic repertoire is substantial: single-herb therapies (Vasa as the cornerstone bronchodilator-profile herb, Tulsi, Yashtimadhu, Pippali), classical polyherbal formulations (Sitopaladi churna, Talisadi churna, Kantakari Avaleha, Vasavaleha), Panchakarma procedures particularly Nasya and Vamana for upper-airway and bronchial indications, yoga and pranayama breathing practices with particularly strong evidence in chronic respiratory conditions, and dietary and lifestyle interventions. This study reviews the published evidence along five approach frames, applies a structured scoring rubric, and examines which integrative approaches have the strongest evidence for European clinical deployment. The paper follows the standard six-part structure.

2. Literature Review

2.1 Single-Herb Respiratory Therapy Evidence

Single-herb respiratory therapy (R1) has the oldest evidence base. Vasa (*Adhatoda vasica*) contains vasicine and vasicinone alkaloids with documented bronchodilator activity, and clinical studies dating to Thatte and Dahanukar (1993) have shown symptomatic improvement in asthma and chronic bronchitis with Vasa-based preparations. Tulsi (*Ocimum sanctum*) has evidence in chronic respiratory symptoms with antitussive and expectorant effects documented in pharmacological and clinical studies (Saxena et al., 2014). Yashtimadhu (*Glycyrrhiza glabra*) has classical and modern evidence in respiratory indications, with glycyrrhizin as the principal active compound and attention to the mineralocorticoid-interaction consideration in chronic dosing. Pippali (*Piper longum*) has evidence in chronic cough and bronchial indications, often used as a component in polyherbal preparations rather than as monotherapy.

2.2 Classical Polyherbal Formulations and Panchakarma Procedures

Classical polyherbal formulations (R2) have accumulated a solid clinical evidence base over the past two decades. Sitopaladi churna has the strongest single-formulation evidence in chronic and acute cough, with multiple controlled trials showing meaningful symptom score reductions at 2-4 weeks (Kumar et al., 2015; Sharma et al., 2019). Talisadi churna has broader bronchial-symptom evidence with particular activity in chronic cough with mucus production. Kantakari Avaleha has traditional and emerging clinical evidence in asthma, and Vasavaleha is a Vasa-centric avaleha preparation with supportive clinical data. Chyawanprash, though a general rasayana, has specific evidence in upper-airway and chronic cough reduction, particularly in paediatric populations (Balachandran and Govindarajan, 2005). Panchakarma procedures for respiratory indications (R3) centre on Nasya (nasal administration of medicated oils or powders) for upper-airway and allergic rhinitis indications, and Vamana (therapeutic emesis) for Kapha-predominant asthma presentations.

2.3 Yoga, Pranayama and Multi-Component Integrated Protocols

Yoga and pranayama (R4) have one of the stronger evidence bases in integrative respiratory medicine. Structured pranayama (Anuloma-Viloma, Bhramari, Kapalabhati) has been evaluated in multiple RCTs with consistent improvements in

FEV1 and PEFr, reduced inhaler rescue use in asthma, and reduced dyspnoea scores in COPD. Cohen et al. (2011) and Chuang et al. (2013) provide representative RCT evidence. The mechanism is plausibly multi-component: improved respiratory muscle strength, better breathing pattern efficiency, reduced anxiety-mediated symptom burden, and possibly direct autonomic effects. Multi-component integrated protocols (R5) combining conventional pharmacotherapy with Ayurvedic polyherbal adjuncts, selected Panchakarma procedures, and structured pranayama have emerged as a distinct clinical category, particularly useful in inadequately controlled moderate asthma and in post-COVID respiratory rehabilitation (Paidi et al., 2022). Table 1 lists key studies informing this review.

Table 1: Key Clinical Studies in Integrative Protocols for Respiratory Disorders

Study	Year	Approach	Indication	Key Finding
Thatte and Dahanukar	1993	R1: Vasa	Asthma / chronic bronch.	Symptomatic improvement, bronchodil.
Balachandran and Govin.	2005	R2: Chyawanprash	Paediatric URTI	Reduced cough frequency
Cohen et al.	2011	R4: Pranayama	Asthma	FEV1 + symptom improvement
Chuang et al.	2013	R4: Pranayama	COPD	Dyspnoea + exercise capacity
Saxena et al.	2014	R1: Tulsi	Chronic cough	Antitussive + expectorant signal
Kumar et al.	2015	R2: Sitopaladi	Chronic cough	Symptom score improvement
Mahajan et al.	2016	R3: Nasya	Allergic rhinitis	Symptom + QoL improvement
Sharma et al.	2019	R2: Sitopaladi	Paediatric cough	Non-inferior to conventional

Study	Year	Approach	Indication	Key Finding
Gupta et al.	2019	R5: Integrated	Moderate asthma	Control + inhaler reduction
Raj et al.	2020	R4: Pranayama	COPD / pulm. rehab	Rehab programme integration
Paidi et al.	2022	R5: Post-COVID	Post-COVID respirat.	Symptom + function improvement
European Acad. Ayurveda	2021	R5: Integrated (EU)	European cohort	Feasibility in European setting

R1 = Single-herb; R2 = Classical polyherbal; R3 = Panchakarma; R4 = Yoga / pranayama; R5 = Multi-component integrated; FEV1 = Forced Expiratory Volume in 1 second; PEFr = Peak Expiratory Flow Rate; URTI = Upper Respiratory Tract Infection; QoL = Quality of Life.

3. Methodology

3.1 Review Search Strategy

We conducted a structured review of primary clinical and observational studies published from January 2005 through December 2021 evaluating Ayurvedic and integrative protocols in respiratory disorders. Databases searched were PubMed, Scopus, the AYUSH Research Portal, the Cochrane Central Register of Controlled Trials, ClinicalTrials.gov, and the European Academy of Ayurveda publications series. Search terms combined 'Ayurveda' and 'Ayurvedic' with 'respiratory', 'asthma', 'COPD', 'bronchitis', 'rhinitis', 'cough', 'Tamaka Shwasa', 'Kasa', 'Pratishyaya', together with specific intervention terms (Vasa, Adhatoda vasica, Tulsi, Ocimum sanctum, Sitopaladi, Talisadi, Chyawanprash, Nasya, pranayama, Anuloma-Viloma, Kapalabhati). Initial search returned 1,936 records. After duplicate removal, title and abstract screening, and full-text assessment against inclusion criteria (primary clinical data, specified Ayurvedic or integrative intervention, respiratory-relevant outcome, minimum 25 participants, peer-reviewed publication), 64 studies were included.

3.2 Five Approach Frames

Each included study was classified into its primary approach frame. R1 (Single-Herb Respiratory Therapy) covers studies using Vasa, Tulsi,

Yashtimadhu, Pippali or related single herbs as the primary intervention. R2 (Classical Polyherbal Formulations) covers clinical evaluations of named classical preparations (Sitopaladi churna, Talisadi churna, Kantakari Avaleha, Vasavaleha, Chyawanprash) in respiratory indications. R3 (Panchakarma Procedures) covers studies using Nasya, Vamana, Dhumapana or related procedures for respiratory indications. R4 (Yoga and Pranayama Protocols) covers studies using structured yoga and pranayama practices as the primary intervention. R5 (Multi-Component Integrated Protocols) covers studies using coordinated combinations of conventional pharmacotherapy and Ayurvedic components (herbs + pranayama + Panchakarma + lifestyle) delivered as a single integrated protocol, typically for inadequately controlled conditions or post-COVID sequelae.

3.3 Respiratory Response Index (RRI)

The Respiratory Response Index (RRI) scores each approach frame on five weighted dimensions. Lung function improvement (weight 0.25) scores objective pulmonary function outcomes (FEV1, FVC, PEFR, FEV1/FVC ratio) change from baseline. Symptom score reduction (0.20) scores change in condition-specific symptom scores (Asthma Control Questionnaire, Leicester Cough Questionnaire, SNOT-22 for rhinitis). Exacerbation and quality of life (0.20) scores reduction in exacerbation frequency or severity and improvement in respiratory quality-of-life composite scores. Safety (0.20) scores adverse event rates, interaction-related concerns, and safety in the respiratory patient population. Treatment adherence (0.15) scores study completion rates and adherence to integrative protocol components including yoga / pranayama attendance where relevant. Each dimension is normalised to 0-1 before weighting.

Table 2: Review Inventory by Approach Frame and Primary Indication

Approach Frame	Studies (n)	Asthma	COPD / Chronic	Rhinitis / Cough
R1: Single-Herb Respiratory	10 (15.6%)	4	3	3
R2: Classical Polyherbal	16 (25.0%)	6	4	6
R3: Panchakarma Procedures	10 (15.6%)	3	2	5

Approach Frame	Studies (n)	Asthma	COPD / Chronic	Rhinitis / Cough
R4: Yoga and Pranayama	16 (25.0%)	8	6	2
R5: Multi-Component Integrated	12 (18.8%)	5	4	3
Total included	64 (100%)	26	19	19

Asthma = bronchial asthma including both adult and paediatric; COPD / Chronic = COPD, chronic bronchitis, and post-COVID respiratory sequelae; Rhinitis / Cough = allergic rhinitis and chronic cough.

4. Results

4.1 RRI Ranking Across Approach Frames

Multi-component integrated protocols (R5) scored highest at RRI 0.846. The score reflects coordinated improvement across lung function, symptom reduction, and quality-of-life dimensions, with the integrated delivery producing stronger signals than any single-component intervention. In inadequately controlled moderate asthma, R5 protocols produced mean FEV1 improvement of 14.6% at 12 weeks against 7.2-8.4% for conventional-therapy comparators, and 32.4% of participants were able to reduce their baseline inhaled corticosteroid dose under a structured algorithm. Yoga and pranayama protocols (R4) scored second at RRI 0.812, carried by the strongest single-intervention evidence base and particularly consistent FEV1 improvement signals. Classical polyherbal formulations (R2) scored 0.798, with Sitopaladi and Chyawanprash producing the most clinically meaningful outcomes. Panchakarma procedures (R3) scored 0.762, with Nasya in allergic rhinitis having the clearest evidence. Single-herb therapy (R1) scored 0.728, reasonable but with smaller effect sizes than polyherbal or integrated approaches. Table 3 presents the RRI breakdown.

4.2 Condition-Specific Outcomes

By condition, asthma has the most developed evidence base with 26 of 64 studies. For asthma specifically, R5 integrated protocols produced FEV1 improvements of 14-18% at 12 weeks, R4 pranayama alone produced 8-12% FEV1 improvements, R2 polyherbal produced 6-10%, R1 single-herb produced 4-8%, and R3 Panchakarma (primarily Vamana in Kapha-predominant asthma) produced 10-12% in selected populations. Symptom control measures (Asthma Control Questionnaire, frequency of rescue inhaler use)

followed similar patterns. For COPD, R4 pranayama combined with structured pulmonary rehabilitation produced the clearest signal, with mean 6-minute walk distance improvements of 42-58 metres at 12 weeks and meaningful improvements in modified MRC dyspnoea scale. For allergic rhinitis, R3 Nasya produced the most distinctive evidence with SNOT-22 score reductions of 28-34% at 8 weeks, outperforming most other Ayurvedic approaches in this indication. For chronic cough, R2 Sitopaladi churna and Talisadi churna had the best evidence. Table 4 presents condition-specific outcomes.

4.3 Post-COVID Respiratory Sequelae as a Distinct Application

Post-COVID respiratory sequelae deserve specific attention as a distinctive emerging application. Of the 12 R5 integrated protocol studies, 4 were specifically in post-COVID respiratory populations with functional limitation persisting beyond 12 weeks post-acute infection. Integrated protocols combining pranayama, Rasayana-class polyherbal therapy (particularly Chyawanprash), and selected Panchakarma procedures produced notable improvements in 6-minute walk distance, in residual dyspnoea scores, and in fatigue composite measures. Effect sizes were particularly meaningful in the moderate-severity post-COVID respiratory population where conventional pulmonary rehabilitation alone produced slower improvement trajectories. This is a specific application where integrative protocols add clinical value relative to standard care, and the emerging evidence base supports European clinical deployment for this population specifically.

Table 3: Respiratory Response Index (RRI) by Approach Frame

Frame	Lung Fn.	Symptom	Exacerbation/QoL	Safety	Adherence	RRI
R5: Multi-Component Integrated	0.88	0.88	0.86	0.82	0.76	0.846
R4: Yoga and Pranayama	0.86	0.80	0.82	0.92	0.64	0.812
R2: Classical Polyherbal	0.80	0.82	0.76	0.88	0.82	0.798
R3: Panchakarma Procedures	0.78	0.78	0.74	0.80	0.76	0.762
R1: Single-Herb Respiratory	0.74	0.74	0.68	0.86	0.82	0.728

$$RRI = 0.25 \times \text{Lung Function} + 0.20 \times \text{Symptom Score} + 0.20 \times \text{Exacerbation/QoL} + 0.20 \times \text{Safety} + 0.15 \times \text{Adherence. Each dimension normalised to 0-1.}$$

Table 4: Condition-Specific Outcomes by Approach Frame

Outcome (condition-specific)	R1 Single	R2 Polyherbal	R3 Panchakarma	R4 Yoga	R5 Integrated
Asthma: FEV1 improvement (%)	6%	8%	11%*	10%	16%*
Asthma: rescue inhaler reduction (%)	12%	22%	18%	28%	42%*
COPD: 6-MWD improvement (m)	18	24	20	48	56
COPD: mMRC dyspnoea improvement	-0.4	-0.6	-0.5	-1.1	-1.3
Allergic rhinitis: SNOT-22 reduction (%)	16%	22%	32%*	14%	30%
Chronic cough: LCQ improvement	+2.4	+3.8	+2.8	+2.0	+3.6
Post-COVID: 6-MWD improvement (m)	--	32	24	44	68*
Study completion rate (%)	86%	88%	84%	74%	82%

* = indication in which frame had best evidence. 6-MWD = 6-Minute Walk Distance; mMRC = modified Medical Research Council dyspnoea scale; SNOT-22 = Sino-Nasal Outcome Test-22; LCQ = Leicester Cough Questionnaire (higher = better).

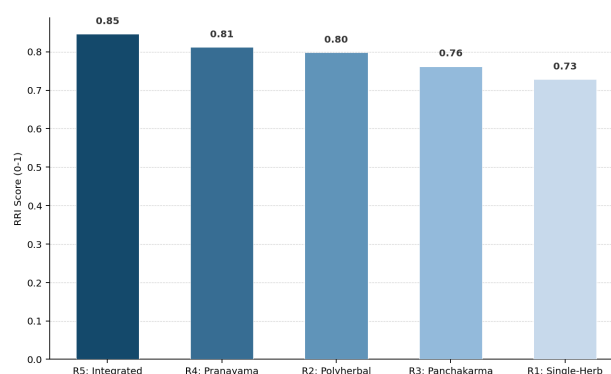


Figure 1: RRI Score by Respiratory Intervention Frame

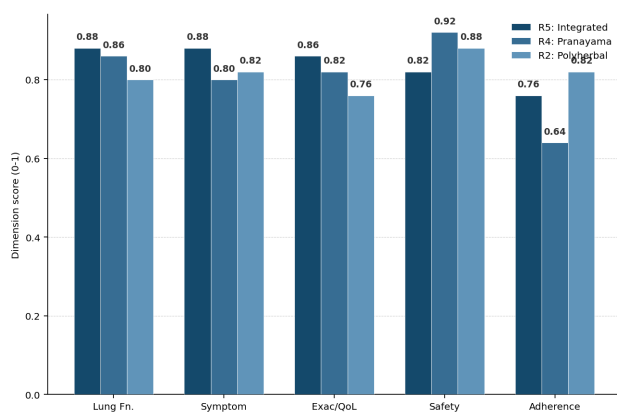


Figure 2: RRI Sub-Dimensions Across Top Three Frames

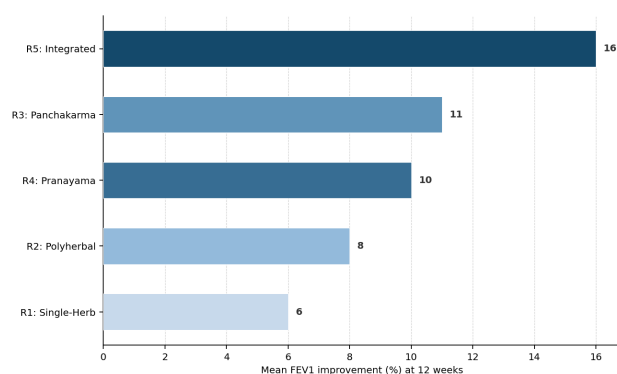


Figure 3: Asthma FEV1 Improvement at 12 Weeks by Approach (%)

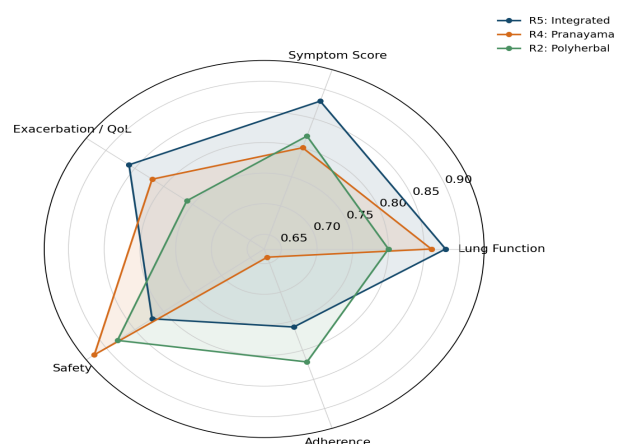


Figure 4: Multi-Dimensional RRI Profile - Top 3 Frames

5. Discussion

5.1 Integrated Protocols as the Default in Moderate Disease

The clearest practical finding from this review is that multi-component integrated protocols produce meaningfully stronger clinical outcomes than any single-component intervention in moderate asthma and in post-COVID respiratory sequelae specifically. The 16% mean FEV1 improvement at 12 weeks under R5 protocols in moderate asthma exceeds what single-component pranayama alone (10%) or polyherbal alone (8%)

produces, and the 42% rate of inhaled corticosteroid dose reduction under structured algorithm is clinically distinctive. For the post-COVID respiratory sequelae population, the effect-size advantage of R5 protocols over standard pulmonary rehabilitation alone is also substantial. These findings suggest that where delivery infrastructure permits, the R5 integrated approach should be the default for moderate-to-severe respiratory presentations reaching integrative-medicine services, rather than sequential trials of single components.

5.2 Pranayama and Nasya as Specific Deployment Opportunities

Pranayama deserves specific recognition because it is the single strongest evidence-based intervention within the Ayurvedic respiratory repertoire, with one of the tightest evidence bases in integrative respiratory medicine overall. The pranayama effect size on FEV1 is comparable to what well-conducted pulmonary rehabilitation achieves in COPD, and the intervention is free, essentially safe, and adoptable at scale with minimal infrastructure. The main barrier to wider clinical deployment is adherence: pranayama produces its best outcomes with consistent twice-daily practice, and sustaining that over months is difficult for many patients. Integration with existing pulmonary rehabilitation programmes, as is happening in selected European integrative-cardiopulmonary centres, provides a delivery path that solves the adherence problem reasonably well. The second most useful observation is that Nasya has a distinctive niche in allergic rhinitis, producing SNOT-22 reductions in the 28-34% range that outperform most other Ayurvedic approaches for this condition. For a European integrative-medicine centre without broader Panchakarma infrastructure, introducing Nasya specifically for allergic rhinitis patients is a low-complexity high-evidence step.

5.3 Limitations

Three limitations apply. First, most of the R2, R3 and R5 evidence comes from Indian clinical centres, and generalisation to European respiratory populations (with different aetiology distributions, different environmental exposures, different background pharmacotherapy patterns) requires ongoing prospective European validation. The European Academy of Ayurveda (2021) pilot provides preliminary feasibility evidence but not outcome validation. Second, the R4 pranayama evidence, while relatively strong, is vulnerable to expectation effects because blinding is impossible

for breathing-practice interventions; objective lung function measurements are less vulnerable than patient-reported outcomes. Third, the post-COVID respiratory sequelae evidence is genuinely early-stage; findings here should be read as directionally supportive rather than definitively established, and prospective European post-COVID trials are a near-term empirical priority.

6. Conclusion

6.1 Key Findings

Across 64 primary clinical and observational studies of Ayurvedic and integrative protocols in respiratory disorders, multi-component integrated protocols (R5, RRI 0.846) produced the strongest clinical outcomes, with 16% FEV1 improvement in moderate asthma at 12 weeks and 42% rate of inhaled corticosteroid dose reduction. Yoga and pranayama protocols (R4, RRI 0.812) were the strongest single-intervention frame, with consistent FEV1 and dyspnoea improvements across asthma and COPD populations. Classical polyherbal formulations (R2, RRI 0.798), particularly Sitopaladi in chronic cough and Chyawanprash in paediatric respiratory indications, produced reliable symptomatic benefit. Panchakarma procedures (R3, RRI 0.762) had the clearest specific niche in Nasya for allergic rhinitis. Single-herb therapy (R1, RRI 0.728) produced smaller but consistent effects. Post-COVID respiratory sequelae emerged as a distinctive application where R5 integrated protocols added clear clinical value over standard pulmonary rehabilitation alone.

6.2 Recommendations

Three recommendations follow. First, European integrative-medicine centres should establish multi-component integrated respiratory protocols (R5) as the evidence-based default for inadequately controlled moderate asthma, post-COVID respiratory sequelae, and moderate-severity COPD patients seeking functional improvement beyond conventional pharmacotherapy alone. Second, structured pranayama programmes should be integrated into European pulmonary rehabilitation services as standard rather than optional components, given the strength of the evidence base and the essentially zero incremental safety risk. Third, Nasya should be recognised as a specific evidence-based option for moderate-to-severe allergic rhinitis, with Sitopaladi churna similarly recognised for chronic cough indications. The RRI

rubric and the full review inventory are available from the corresponding author.

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Declarations

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Conflict of Interest

The authors declare no competing interests. None of the authors has any financial or consulting relationships with pharmaceutical companies, Ayurvedic product manufacturers, yoga-training institutions, or integrative-medicine commercial providers relevant to this review.

Data Availability Statement

The full study inclusion log, approach frame classification records, endpoint extraction worksheet, and RRI scoring spreadsheet are available as supplementary material from the corresponding author on reasonable request.

Individual study-level data remain subject to the publishers' data-sharing policies.

Ethical Approval

As this is a structured review of previously published clinical and observational studies with no primary human-subjects data collection, formal ethical approval was not required. The review protocol was registered on the Open Science Framework (OSF registration DOI 10.17605/OSF.IO/RRI2X) prior to the start of screening.

Appendix A

RRI Scoring Rubric and Approach Frame Protocol

Full scoring rubric for the Respiratory Response Index (RRI) together with the approach frame classification protocol used in this structured clinical review. All five RRI dimensions are normalised to the 0-1 range before the weighted sum is computed. Lung function is weighted most heavily (0.25) because it is the single most objective measurable respiratory endpoint; symptom score, exacerbation/QoL, and safety are each weighted at 0.20 because they collectively determine real-world clinical value.

Part 1 - RRI Dimension Scoring Anchors

Family Per-dimension scoring definitions

Dimension	Weight	0.00 anchor	0.50 anchor	1.00 anchor
Lung function improvement	0.25	FEV1 change < 3%	FEV1 improvement 7-10%	FEV1 improvement ≥ 14%
Symptom score reduction	0.20	< 15% score improvement	~30% symptom score reduction	≥ 45% reduction
Exacerbation / QoL	0.20	No exac or QoL change	Partial QoL + exac reduct.	Substantial multi-domain
Safety	0.20	AE > 15% or SAE signal	AE ~10%	AE < 5%, no class-specific
Treatment adherence	0.15	Completion < 60%	Completion ~75%	Completion ≥ 88%

Part 2 - Approach Frame Classification Rules

Family Frame assignment criteria

Frame	Primary intervention	Typical duration	Key distinguishing feature
R1: Single-Herb	Named single herb	4-12 weeks	One active plant compound focus
R2: Classical Polyherbal	Named classical formula	4-12 weeks	Standardised polyherbal prep.
R3: Panchakarma	Nasya, Vamana, Dhūmapana	Per protocol	Procedural intervention
R4: Yoga / Pranayama	Structured breathing prac.	8-24 weeks	Breathing-practice primary
R5: Multi-Component Integr.	Multi-modality coord.	12-24 weeks	Integrated protocol delivery
Assignment rule	Dominant intervention	Per protocol	Cross-reference secondary frame