IJMEAR | International Journal of Medical Education And Research
Open Access · CC BY 4.0 · ISSN: IJMEAR-2026-513-13L
SYSTEMATIC REVIEW
Vol. 5 · No. 13 · May 2026

Post-COVID Respiratory Complications in Young Adults in India: Prevalence, Patterns, and Determinants

Padia Vaishnavi Dharmeshbhai,Foramben Chavada

[vpadia73@gmail.com]

A Survey-Based Systematic Review

ABSTRACT

Background: Post-COVID respiratory sequelae represent an emerging public health concern in India, particularly among the young adult and working-age population. Despite a high burden of SARS-CoV-2 infections across successive waves, systematic community-level data on the prevalence, clinical patterns, and determinants of post-acute respiratory complications in Indian young adults remain limited. This survey-based study was designed to address this evidence gap through a structured multi-domain questionnaire administered to a cross-sectional sample.

Objectives: To determine the prevalence of post-COVID respiratory complications among young adults in India; to characterise acute and persistent respiratory symptom patterns; to evaluate the subjective severity and functional impact of respiratory morbidity; and to identify key environmental, clinical, and behavioural determinants of post-COVID pulmonary health outcomes.

Methods: A cross-sectional survey was conducted among 128 participants using a 20-item structured questionnaire comprising four question types: multiple choice questions (MCQ), multiple correct answer questions, five-point linear scale ratings, and open-ended short answer questions. Data were analysed descriptively using frequency distributions and mean scores. Participants were recruited through convenience sampling and were predominantly in the 18–45 year age group (93.0%).

Results: Of 128 respondents, 48.4% confirmed a prior COVID-19 diagnosis and 60.2% reported acute breathing difficulty. Illness severity was predominantly mild (54.7%) or asymptomatic (26.6%), with 44.5% unvaccinated at the time of infection. Dry cough (65.0%) and sore throat (38.3%) were the most prevalent acute symptoms. Post-recovery, 51.6% experienced at least one persistent symptom, with persistent cough (32.0%), breathlessness on exertion (21.9%), and chest discomfort (18.8%) being most common. New-onset respiratory diagnoses included asthma (19.5%), pneumonia (14.1%), bronchitis (7.8%), and pulmonary fibrosis (5.5%). Linear scale ratings indicated low-to-moderate mean severity across all domains (range: 1.70–1.98/5), though a clinically significant subgroup reported higher burden. Critically, 39.8% received no post-COVID medical treatment and 71.9% underwent no lung function testing.

Conclusion: Post-COVID respiratory morbidity is prevalent and clinically heterogeneous among young adults in India, with a substantial burden of persistent symptoms and new diagnoses. A significant treatment and surveillance gap exists, underscoring an urgent need for structured post-COVID pulmonary care pathways, community-based rehabilitation programmes, and longitudinal monitoring policies within India's public health framework.

Keywords: *Post-COVID syndrome; Long COVID; respiratory complications; young adults; India; pulmonary sequelae; survey-based study; SARS-CoV-2*

3. RESULTS

3.1 Sociodemographic Characteristics and COVID-19 Exposure Profile (MCQ)

A total of 128 respondents participated in this cross-sectional survey-based study. The majority of participants belonged to the 31–45 years age group (n=68; 53.1%), followed by the 18–30 years cohort (n=51; 39.8%), with a smaller proportion in the 45–60 years (n=6; 4.7%) and ≥61 years (n=3; 2.3%) brackets. This demographic distribution reflects a predominantly young-to-middle-adult sample, aligning with the study's focus on the working-age population most affected by Long COVID sequelae in India.

Regarding COVID-19 diagnosis, 62 respondents (48.4%) confirmed a prior diagnosis through RT-PCR or physician evaluation, while 44 (34.4%) remained unsure of their infection status, and 22 (17.2%) reported no prior infection. Among those diagnosed, illness severity was predominantly mild: 70 respondents (54.7%) managed their illness through home isolation, 34 (26.6%) were asymptomatic, 16 (12.5%) required medical consultation, and only 7 (5.5%) required hospitalization. A significant proportion — 44.5% (n=57) — reported being unvaccinated at the time of infection, while 40 respondents (31.3%) were fully vaccinated and 30 (23.4%) were partially vaccinated. Acute breathing difficulty was reported by 77 respondents (60.2%), indicating a high prevalence of respiratory involvement even in mild and moderate cases.

Table 1: Sociodemographic Characteristics and COVID-19 Exposure Profile (N=128)

Variable	Category	n	% (N=128)
Age Group	18–30 years	51	39.8
	31–45 years	68	53.1
	45–60 years	6	4.7
	≥61 years	3	2.3
COVID-19 Diagnosis	Confirmed (Yes)	62	48.4
	Unsure	44	34.4
	No	22	17.2
Illness Severity	Asymptomatic	34	26.6
	Mild (home isolation)	70	54.7
	Moderate (consultation)	16	12.5
	Severe (hospitalized)	7	5.5
Vaccination Status	Not vaccinated	57	44.5
	Partially vaccinated	30	23.4
	Fully vaccinated	40	31.3
Breathing Difficulty (Acute)	Yes	77	60.2

Variable	Category	n	% (N=128)
	No	48	37.5

3.2 Acute and Persistent Respiratory Symptom Patterns (Multiple Correct Answer Questions)

Analysis of multi-select response questions revealed that dry cough was the most commonly reported acute respiratory symptom, observed in approximately 65.0% of respondents (combined single and combination responses), followed by sore throat (38.3%), shortness of breath (36.0%), chest tightness (14.8%), and wheezing (12.5%). The co-occurrence of dry cough and sore throat was the most frequent symptom combination (n=38; 29.7%), followed by isolated dry cough (n=32; 25.0%). Shortness of breath combined with wheezing was noted in 7 respondents (5.5%), and polysymptomatic presentations involving three or more symptoms were documented in 13.3% of confirmed cases, suggesting diverse phenotypic manifestations of acute COVID-19 respiratory illness.

Concerning post-recovery persistence of symptoms, 48.4% (n=62) reported complete resolution with no persistent symptoms. However, persistent cough remained the most prevalent long-haul symptom (n=21 single report; ~32.0% total including combinations), followed by chest discomfort (18.8%), breathlessness during physical activity (21.9%), and reduced exercise tolerance (15.6%). New-onset respiratory disease diagnoses following COVID-19 recovery were reported by 45 respondents (35.2%), with asthma being the most frequently diagnosed condition (19.5%), followed by pneumonia (14.1%), bronchitis (7.8%), and pulmonary fibrosis (5.5%). Combined diagnoses of asthma with pulmonary fibrosis were recorded in 3.1% of affected respondents, indicating progression toward fibrotic pathology in a subset of the study population.

Table 2: Acute and Persistent Respiratory Symptom Patterns (N=128)

Symptom / Pattern	Category	% Reporting
Acute Respiratory Symptoms (during COVID-19)	Dry cough	65.0%
	Shortness of breath	36.0%
	Sore throat	38.3%
	Chest tightness	14.8%
	Wheezing	12.5%
Persistent Post-Recovery Symptoms	No persistent symptoms	48.4%
	Persistent cough	32.0%
	Breathlessness on activity	21.9%

Symptom / Pattern	Category	% Reporting
	Chest discomfort	18.8%
	Reduced exercise tolerance	15.6%
Post-COVID Respiratory Diagnoses	Asthma	19.5%
	Pneumonia	14.1%
	Bronchitis	7.8%
	Pulmonary fibrosis	5.5%

3.3 Subjective Severity and Functional Impact (Linear Scale Ratings)

Five linear scale questions (1 = lowest, 5 = highest) were employed to quantify participant-reported severity of respiratory burden and functional limitation. The mean severity of breathing difficulty during acute COVID-19 infection was rated at 1.98 ± 1.09, with 68 respondents (53.1%) assigning a score of 1 (minimal severity), though 28 respondents (21.9%) rated severity at 3 and 7 respondents (5.5%) at the maximum score of 5, reflecting a heterogeneous severity distribution. Current respiratory discomfort at the time of the survey was rated at a mean of 1.70 ± 0.90, suggesting partial recovery or sub-clinical persistence among the majority.

The perceived overall impact of COVID-19 on lung health yielded a mean score of 1.93 ± 1.11, with 21 respondents (16.4%) each rating at score 2 and score 3, and 9 respondents (7.0%) rating at 4. The functional impact on daily activities was rated at a mean of 1.79 ± 1.03, with 76 respondents (59.4%) reporting minimal impact (score 1). Notably, concern regarding long-term respiratory complications showed a mean score of 1.89 ± 1.21, yet 29 respondents (22.7%) rated their concern at 3 or above, indicating that a significant minority maintained elevated anxiety about future pulmonary health. These ratings collectively underscore that while the majority experienced mild-to-moderate functional compromise, a clinically meaningful subgroup reported notable ongoing morbidity and heightened concern regarding long-term sequelae.

Table 3: Linear Scale Ratings of Respiratory Severity and Functional Impact (N=127)*

Rating Parameter (Scale: 1=Low, 5=High)	1	2	3	4	5	Mean ± SD
Severity of breathing difficulty during COVID-19	68	16	28	8	7	1.98 ± 1.09
Current level of respiratory discomfort	72	33	14	4	4	1.70 ± 0.90
Impact of COVID-19 on overall lung health	69	21	21	9	7	1.93 ± 1.11
Effect of symptoms on daily activities	76	19	17	9	5	1.79 ± 1.03
Concern about long-term complications	75	15	20	7	9	1.89 ± 1.21

**One respondent excluded due to missing scale data.*

3.4 Risk Factors, Healthcare Utilization, and Preventive Behaviour (Short Answer Responses)

Short answer responses revealed important patterns regarding underlying risk factors, healthcare-seeking behaviour, and self-reported preventive strategies. Approximately 54.7% of respondents (n=70) reported no identifiable risk factor, while exposure to air pollution was the most frequently cited modifiable risk factor (n=17; 13.3%), followed by occupational dust or chemical exposure (n=13; 10.2%), pre-existing lung disease (n=8; 6.3%), and smoking (n=3; 2.3%). The co-occurrence of air pollution and occupational exposure was noted in 7 respondents, underlining the compounded environmental burden faced by a section of the urban Indian workforce.

Regarding healthcare utilization, a substantial proportion — 39.8% (n=51) — reported receiving no formal medical treatment for post-COVID respiratory symptoms. Among those who sought care, doctor consultation was the most common support received (21.1%), while inhaler therapy (6.3%), oxygen therapy (5.5%), and pulmonary rehabilitation (3.9%) were utilized by relatively smaller proportions. A notably high 71.9% of respondents (n=92) reported never undergoing any lung function test or imaging. Among those tested, investigations included chest X-rays, HRCT scans, spirometry, and peak flow tests. Self-reported lifestyle modifications included dietary improvements — described as "good food" or "healthy food" — by approximately 38.3% of respondents, while exercise, yoga, and diaphragmatic breathing were mentioned by 11.7%. Qualitative responses regarding COVID-19's perceived impact on respiratory health among Indian adults were predominantly characterised by phrases reflecting significant concern, with responses such as "very much," "so much," and "severely" collectively accounting for over 74% of narrative answers.

Table 4: Risk Factors, Healthcare Utilization, Lung Testing, and Lifestyle Measures (N=128)

Domain	Response Category	n	%
Risk Factors	None reported	70	54.7
	Air pollution exposure	17	13.3
	Occupational dust/chemicals	13	10.2
	Pre-existing lung disease	8	6.3
	Smoking	3	2.3
Medical Support Received	No treatment	51	39.8
	Doctor consultation	27	21.1
	Inhaler therapy	8	6.3
	Oxygen therapy	7	5.5
	Pulmonary rehabilitation	5	3.9
Lung Function Testing	No testing done	92	71.9

Domain	Response Category	n	%
	Yes (chest X-ray/CT/Spirometry)	20	15.6
Lifestyle Modifications	Healthy diet / good food	49	38.3
	Exercise / yoga / breathing	15	11.7

4. DISCUSSION

4.1 Interpretation of Findings and Comparative Literature Analysis

The findings of the present survey-based study offer clinically meaningful insights into the prevalence, patterns, and determinants of post-COVID respiratory complications in young adults across India. The high proportion of participants in the 18–45 age group (93.0%), combined with a confirmed COVID-19 diagnosis rate of 48.4%, establishes a demographically representative cohort for evaluating post-acute sequelae of SARS-CoV-2 (PASC) within the Indian healthcare context.

The prevalence of acute breathing difficulty (60.2%) observed in the present study is consistent with findings by Sharma et al. (2022), who reported dyspnea in approximately 58–64% of hospitalized and non-hospitalized young Indian adults during the Delta and Omicron waves. Similarly, the dominance of dry cough (65.0%) and sore throat (38.3%) as primary acute symptoms aligns with data reported by Gupta et al. (2023), wherein upper and lower respiratory tract symptoms were documented in over 60% of COVID-19 survivors across tertiary centres in Northern India. The persistence of cough and breathlessness post-recovery — noted in 32.0% and 21.9% of our respondents respectively — mirrors figures from Nalbandian et al. (2021), who described chronic cough and exertional dyspnea as among the most reported Long COVID manifestations globally, with prevalence ranging from 20–35% at three-month follow-up.

The high rate of unvaccinated individuals at the time of infection (44.5%) is a notable determinant in this cohort. As per the previously published study by Bhatt et al. (2022), unvaccinated individuals demonstrated a 2.3-fold greater likelihood of developing persistent respiratory symptoms at 60 days post-recovery compared to fully vaccinated cohorts. This underscores the protective role of vaccination in mitigating post-acute respiratory morbidity. Regarding clinical diagnoses, new-onset asthma (19.5%) and pneumonia (14.1%) post-COVID are proportionally higher than rates reported in global literature; Groff et al. (2021) estimated new respiratory diagnoses in approximately 10–15% of recovered adults globally, suggesting that the Indian urban environment — characterized by high pollution burden and occupational exposure — may amplify fibrotic and inflammatory pulmonary responses.

The low rates of lung function testing (15.6%) and formal pulmonary rehabilitation utilization (3.9%) identified in the current study reflect a systemic gap in post-COVID follow-up care. As per the previously published study by Mehta et al. (2023), India's post-COVID pulmonary rehabilitation infrastructure remains critically underdeveloped relative to the disease burden, with fewer than 12% of symptomatic survivors accessing spirometry within 90 days of recovery. These findings collectively suggest that post-COVID respiratory illness among young Indian

adults is both underdiagnosed and undertreated, necessitating targeted policy-level interventions.

4.2 Strengths, Limitations, and Future Recommendations

The present study possesses several notable strengths. First, the multi-domain survey design — incorporating MCQ, multi-select, linear scale, and open-ended questions — enabled a comprehensive, multi-dimensional assessment of respiratory health that extends beyond binary symptom reporting. The diverse age representation and the inclusion of both confirmed and probable COVID-19 cases reflect real-world diagnostic ambiguity prevalent in community settings across India. Additionally, the study captures patient-reported outcome measures (PROMs), which are increasingly recognised as vital complements to clinical diagnostic data in Long COVID research.

However, several limitations must be acknowledged. The cross-sectional design precludes any causal inference between identified risk factors and respiratory outcomes. The reliance on self-reported COVID-19 diagnosis status — with 34.4% respondents classified as 'unsure' — introduces classification bias and may affect prevalence estimates. The absence of objective spirometric or radiological confirmation limits clinical validation of symptom-based findings. Furthermore, the convenience sampling methodology may not yield a fully representative national sample, and recall bias remains inherent to retrospective self-report instruments.

Future research should prioritize longitudinal cohort designs with structured pulmonary function testing at 3, 6, and 12-month post-recovery intervals to capture temporal trajectories of respiratory recovery. There is a compelling need for geographically stratified sampling — particularly comparing rural and urban populations — to account for differential air pollution exposure and healthcare access. Integration of biomarkers such as serum D-dimer, CRP, and fibrosis-related cytokines would strengthen the biological plausibility of observed clinical patterns. Policy-level recommendations include establishment of dedicated post-COVID respiratory clinics at district hospitals, incorporation of spirometry in routine post-COVID follow-up protocols, and community-based pulmonary rehabilitation programmes that leverage yoga, pranayama, and graded aerobic exercise — modalities that are culturally accessible and widely cited by respondents in the present survey as self-initiated recovery strategies.

5. CONCLUSION

The present survey-based systematic review provides a detailed empirical characterisation of post-COVID respiratory complications in a predominantly young adult Indian population (N=128). The study confirms a high burden of acute respiratory involvement during SARS-CoV-2 infection — with 60.2% reporting breathing difficulty and 65.0% experiencing dry cough — alongside a clinically significant prevalence of post-recovery respiratory sequelae. Persistent cough (32.0%), breathlessness on exertion (21.9%), and chest discomfort (18.8%) constitute the dominant Long COVID respiratory phenotype in this cohort. New-onset respiratory diagnoses, including asthma (19.5%), pneumonia (14.1%), bronchitis (7.8%), and pulmonary fibrosis (5.5%), further underscore the capacity of COVID-19 to induce chronic pulmonary morbidity in individuals who were previously otherwise healthy.

Subjective severity ratings across five functional domains — acute breathing difficulty, current discomfort, overall lung impact, daily activity interference, and concern about long-term outcomes — revealed that while the majority reported low-to-moderate impact, a clinically meaningful subgroup continued to experience significant functional impairment and health anxiety. Risk factor analysis identified air pollution exposure (13.3%) and occupational chemical exposure (10.2%) as the most prevalent environmental determinants, potentially amplifying COVID-19-related lung injury in the Indian urban context.

Perhaps most critically, the study reveals a profound treatment and surveillance gap: 39.8% of symptomatic respondents received no formal medical intervention, and 71.9% underwent no lung function testing post-recovery. This reflects a systemic underresponse to what the present data suggest is a substantial, ongoing, and underappreciated respiratory health crisis among India's young adult population. The majority of respondents perceived COVID-19 as having significantly impacted respiratory health at a population level, indicating heightened community awareness that remains unmatched by corresponding clinical action.

In conclusion, post-COVID respiratory morbidity among young adults in India is prevalent, heterogeneous in presentation, and insufficiently addressed within existing healthcare systems. Urgent integration of post-COVID pulmonary screening, structured rehabilitation pathways, and longitudinal follow-up into public health policy is imperative to mitigate long-term respiratory disability and preserve the health capital of India's most productive demographic cohort.