
POST – VIRAL SYNDROME

M. Neha Sai*¹, Sadvika Lakakula¹, Dr. Padige Sri Varsha²

¹PharmD Students, Malla Reddy College of Pharmacy, Hyderabad, Telangana.² Assistant professor, Department of Pharmacy Practice, Malla Reddy College of Pharmacy, Hyderabad, Telangana.

Article Received: 12 January 2026

*Corresponding Author: M. Neha Sai

Article Revised: 01 February 2026

PharmD Students, Malla Reddy College of Pharmacy, Hyderabad, Telangana.

Published on: 20 February 2026

DOI: <https://doi-doi.org/101555/ijrpa.8830>

ABSTRACT

Post-viral syndrome, sometimes called "post-viral fatigue" by doctors, is a multifaceted condition marked by ongoing pain, exhaustion, musculoskeletal discomfort, neuropathic pain, cognitive challenges, and sleep issues that can arise after recovering from a viral infection. This condition may persist for weeks, months, or even years, greatly affecting a person's quality of life. Various treatments and home remedies might alleviate fatigue and assist individuals in managing their energy. Although post-viral syndrome can resemble other medical conditions, it is crucial to consult a doctor if symptoms are prolonged. This article provides a concise and complete overview of post viral syndrome, detailing its causes, clinical features, management, and key points for patient care.

INTRODUCTION

Post-viral syndrome also called post viral fatigue, is a multifaceted condition marked by ongoing pain, exhaustion, musculoskeletal discomfort, neuropathic pain, cognitive challenges, and sleep issues that can arise after recovering from a viral infection. This condition may persist for weeks, months, or even years, greatly affecting a person's quality of life. [1]

Post-viral syndrome seems to be triggered by the body's response to the virus itself. Even after the virus has been cleared from the body, individuals may experience a lack of energy and a general sense of malaise. This condition can persist for several days to months following a viral infection.[3]

Instances of PVS have been reported after infections like influenza B, Ebola, Chikungunya, Dengue, and numerous others. However, the pathophysiology of PVSs is still not well

understood, and there are limited studies that offer a thorough overview of the condition, its causative agents, and effective treatment options.[1]

With individuals who have weakened immune systems appearing to be at heightened risk. It remains unclear why the effects of a virus can linger in the body. Some theories suggest that the virus 'overloads' the immune system, preventing healthy immune system resolution for weeks, months or years. [4]

With the COVID-19 pandemic affected millions of people worldwide, the need for an understanding of the etiology of post-viral illness and how to help individuals cope with the sequelae is paramount.[2]

This narrative will provide a summary of the sequelae of PVSs, viral agents that cause it, and the pathophysiology and treatment.

In the absence of ongoing viral replication or other diagnoses, post-viral syndrome (PVS) is a clinical disorder marked by the persistence of symptoms for weeks to months after recovery from an acute viral infection. Debilitating tiredness, cognitive impairment, myalgia, sleep difficulties, and autonomic dysfunction are often reported symptoms that can seriously affect day-to-day functioning and quality of life [5,6].

Post-viral syndrome is still poorly characterized and often underdiagnosed in clinical practice, despite growing awareness. For many years, there has been evidence linking viral infections to protracted post-infectious symptoms. Post-viral sequelae have been linked to viruses such as the Epstein-Barr virus, influenza virus, dengue virus, chikungunya virus, and earlier coronaviruses like SARS-CoV-1 [7,8]. However, post-acute sequelae of SARS-CoV-2 infection, or protracted COVID, have emerged as a result of the COVID-19 pandemic, drawing fresh attention to this illness on a worldwide scale. The idea that PVS is a more general post-infectious phenomenon rather than an illness unique to a single virus has been strengthened by the parallels between protracted COVID and previously reported post-viral syndromes [9].

Post-viral syndrome has a complicated pathogenesis that is still poorly understood. Immune system dysregulation, chronic low-grade inflammation, autonomic nervous system malfunction, mitochondrial impairment, and neuroinflammation are among the suggested reasons [10,11]. Furthermore, even after apparent viral clearance, residual viral components may still elicit immunological responses, which might prolong symptomatology. The variety of symptoms raises the possibility that several overlapping processes are at play. Post-viral syndrome is mostly diagnosed clinically, depending on the duration of symptoms after viral disease, when other medical or mental disorders have been ruled out. Clinical care

and research are severely hampered by the lack of established diagnostic criteria and trustworthy biomarkers [6,11]. Since there is currently no proven cure, the majority of treatment approaches are supportive and concentrate on symptom management, rehabilitation, and lifestyle changes.

DEFINITION

Post-viral syndrome is defined as the persistence of fatigue and other systemic symptoms for weeks to months following recovery from an acute viral infection in the absence of ongoing infection or alternative diagnosis.

Epidemiology

Research into the long-term consequences of viral infections has been ongoing for some time. Nonetheless, interest in this field has surged in recent decades due to the repeated emergence of epidemic and pandemic viruses, each unveiling new aspects of health challenges following infection. Historically, the acknowledgment of post-viral syndromes dates back to early 20th-century instances of neurological issues after influenza outbreaks. Post-viral syndrome can affect individuals across all age groups, though it is more commonly reported among adults and females. The prevalence varies depending on the viral pathogen and severity of the initial infection. Epidemiological data increased significantly following the SARS outbreak and, more prominently, the COVID-19 pandemic, where a substantial proportion of recovered patients reported persistent fatigue, cognitive impairment, and autonomic symptoms. These findings have underscored the growing public health burden of post-viral sequelae worldwide.[17]

Etiology

The cause of post-viral syndrome is complex and not completely understood. It is thought to arise from a complicated interplay of viral triggers, immune system dysfunction, and ongoing inflammatory responses that continue even after the initial infection phase has ended.

1. Viral triggers

Post-viral syndrome can arise after various viral infections. Clinical research has shown that post-infective fatigue states can occur following infections like the Epstein-Barr virus (also known as glandular fever), Ross River virus, and Q fever, suggesting that different viral infections can result in ongoing fatigue and associated symptoms. [5] An examination of post-viral syndrome highlights that infections with viruses such as Epstein-Barr,

cytomegalovirus, human herpesvirus, and enteroviruses, among others, have been linked to extended symptoms after the initial illness has subsided. Likewise, detailed clinical reviews identify viruses like influenza, HIV, and even SARS-CoV-2 as potential causes of post-viral fatigue.[3]

2. Immune and inflammatory responses

One of the primary factors contributing to the development of post-viral syndrome is the persistent activation of the immune and inflammatory systems. Even after the initial viral infection has subsided, the immune system may continue to be active. This ongoing activation results in the continuous release of pro-inflammatory cytokines and mediators, leading to chronic low-grade inflammation. Such prolonged immune responses can impact various organ systems and are thought to significantly contribute to the ongoing symptoms like fatigue, muscle pain, and cognitive issues. In certain instances, the incomplete removal of viral particles might further trigger immune signaling, thereby extending the inflammatory process and hindering recovery.[14]

3. Neurological and autonomic factors

Neurological and autonomic dysfunction plays a crucial role in the development of post-viral syndrome. Viral infections can impact both the central and peripheral nervous systems, resulting in symptoms like cognitive difficulties, sleep issues, and heightened sensory sensitivity. Furthermore, disruptions in the autonomic nervous system can lead to orthostatic intolerance, heart palpitations, dizziness, and irregular heart rate variability. These issues significantly contribute to the ongoing fatigue and decreased functional ability seen in those affected.[15]

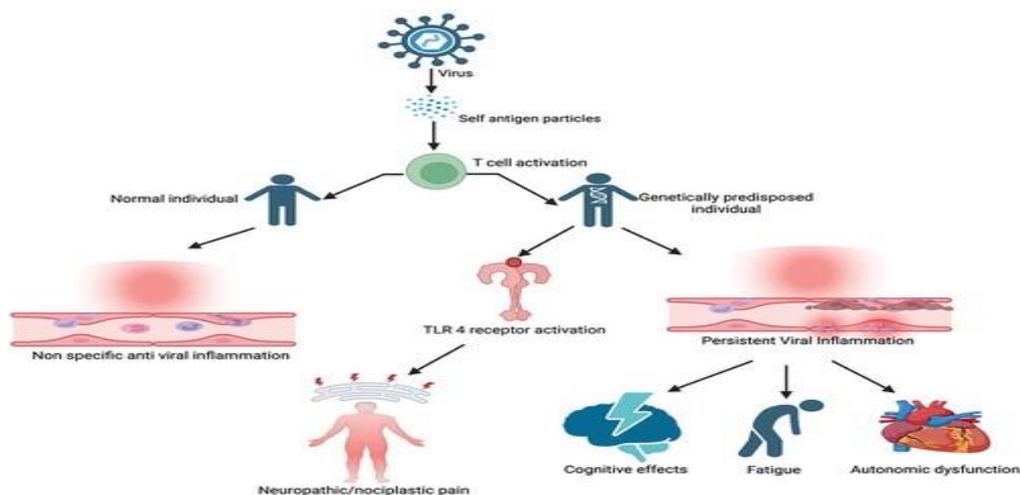
4. Energy metabolism and psychological factors

Impairment in cellular energy metabolism has also been proposed as a contributing factor in post-viral syndrome. Viral infections may disrupt mitochondrial function, leading to reduced adenosine triphosphate (ATP) production and inefficient energy utilization. This energy deficit can manifest clinically as persistent fatigue, muscle weakness, and exercise intolerance. Mitochondrial dysfunction may further interact with immune and inflammatory pathways, thereby prolonging recovery and symptom persistence.[15]

5. Psychological factors

Psychological and behavioral factors may also influence the development and persistence of post-viral syndrome. The stress of acute illness, prolonged recovery, and functional limitations can contribute to anxiety, depression, and emotional distress. Psychological stress may further exacerbate fatigue through neuroendocrine and immune interactions. Although not a primary cause, these factors can modulate symptom severity and delay functional recovery.[16]

Pathophysiology



This diagram illustrates how a viral infection can trigger a chronic disease state in genetically predisposed individuals through a "molecular mimicry" process, where T cell activation by viral self-antigens leads to a dysfunctional immune trajectory. While a normal individual experiences temporary, resolving inflammation, a predisposed person suffers from persistent viral inflammation and TLR4 receptor activation, which collectively damage the vascular system and sensitize the nervous system. This pathological cascade results in a cluster of debilitating symptoms characteristic of conditions like Long COVID or ME/CFS, specifically neuropathic pain, cognitive impairment (brain fog), systemic fatigue, and autonomic dysfunction (such as heart rate irregularities).[1]

Diagnosis

Post-viral syndrome is primarily a clinical diagnosis based on the persistence of symptoms following recovery from an acute viral infection. Diagnosis relies on detailed history, duration of fatigue and systemic complaints, and exclusion of alternative medical or psychiatric conditions. Routine laboratory investigations such as complete blood count,

thyroid function tests, inflammatory markers, and metabolic panels are typically performed to rule out other causes. Due to the absence of specific biomarkers, diagnosis remains one of exclusion.

Symptoms

Post-viral syndrome often emerges after an upper respiratory infection, leaving the individual unable to fully recover and experiencing a wide range of symptoms that can last for months or even years. While symptoms differ among individuals, most report feeling persistently tired and generally unwell, regardless of how much rest they get or how well they care for themselves. The primary symptom is severe muscle fatigue, frequently accompanied by muscle pain, headaches, tingling sensations, dizziness, frequent urination, cold hands and feet, episodes of sweating, and fainting spells.[13] Additional symptoms of post-viral syndrome may include:

- confusion
- difficulty focusing
- headaches
- muscle aches and pains
- stiff joints
- a sore throat
- swollen lymph nodes.[3]

In some instances, the body may simply need more time to completely eliminate the virus. However, if these symptoms persist beyond a few weeks, it is advisable to consult a doctor. Clinical examinations typically reveal no abnormalities, and routine lab tests do not show any issues, making the diagnosis one of exclusion. The illness can follow one of three paths: some patients recover fully, others experience a relapsing and remitting course, and some endure chronic illness. Relapses are often triggered by excessive physical or mental stress, and patients who rest sufficiently in the early stages are believed to have the best chance of achieving a full recovery without relapse.[13]

Post-Viral Pain

Post-viral pain is a common sequela following viral infections and may persist even after resolution of the acute illness. It can present as musculoskeletal pain, neuropathic pain, or generalized body aches. Post-viral pain is a frequently encountered lingering symptom after

viral infections. This pain might start during the initial phase of the infection or emerge weeks to months after recovery. Various viral infections, like chikungunya, varicella-zoster virus, HIV, poliovirus, influenza, dengue, and coronaviruses, have been linked to extended pain conditions. Suggested mechanisms involve ongoing immune activation, inflammatory reactions, and virus-induced nerve damage, all of which contribute to chronic pain and a diminished quality of life.[18]

Diagnosis and Treatment of Post-Viral Pain

Research on the diagnosis and management of post-viral pain is scarce, with no established diagnostic criteria apart from Postherpetic neuralgia (PHN), identified when neuropathic pain continues for over three months in the same dermatomal region as a previous shingles rash. Typically, post-viral pain is diagnosed by excluding other conditions like cancer, rheumatoid arthritis, or radiculopathy. [19]

Treatment generally aligns with chronic pain management, though some virus-specific guidelines are available. For instance, in Chikungunya (CHIKV), NSAIDs and analgesics are recommended during the post-acute phase, while corticosteroids (e.g., prednisone) are reserved for severe cases. Physiotherapy is beneficial in alleviating pain and preventing muscle atrophy. For neuropathic post-viral pain, including PHN, first-line treatments consist of gabapentin, pregabalin, tricyclic antidepressants (TCAs), and SNRIs, with tertiary amines like amitriptyline and clomipramine being more effective than secondary amines. Opioids and cannabinoids may serve as adjunct therapies, and tramadol and topical agents can also be effective. Although antiviral drugs and vaccination can reduce acute herpes zoster pain and prevent PHN, they do not prevent general post-viral pain or fatigue. Behavioral therapies, such as Cognitive Behavioral Therapy (CBT) and mindfulness, are crucial for symptom management. In certain cases, intravenous immunoglobulin (IVIG) has proven beneficial for post-polio pain, and combination therapy (IVIG, steroids, gabapentinoids, antidepressants, tramadol, topical agents) has shown effectiveness in post-COVID peripheral neuropathy cases. [19]

Post-Viral Fatigue

Another typical symptom that might linger following a viral illness is fatigue. Some people experience exhaustion only after engaging in physical activity, whereas others may experience it even when at rest. Additionally, there is a distinction between brain weariness, which is linked to attention and cognitive deficiencies, and physical weakness. Fatigue can

significantly lower quality of life and make it difficult for patients to work or carry out their responsibilities in other areas. A diagnosis of CFS may be made if the exhaustion persists for more than six months.

Ross River virus (RRV) has been linked to post-viral weariness in addition to post-viral discomfort. Thirteen of sixty patients with confirmed RRV infection experienced postinfectious fatigue syndrome in a prospective cohort study.[1]

The most prevalent symptom of PPS is tiredness, with over 90% of polio survivors reporting increased or new-onset fatigue, and 41% reporting that exhaustion hindered their ability to function well. Since a sizable number of patients have continued to feel weariness and anhedonia after surviving the illness, COVID-19 has also been linked to post-viral fatigue in more recent times.

Diagnosis and Treatment of Post-Viral Fatigue

Post-viral fatigue lacks specific diagnostic criteria and is primarily diagnosed clinically when persistent exhaustion follows a viral illness and cannot be explained by other medical conditions such as anemia, malignancy, or endocrine disorders. Management is largely supportive and focuses on energy conservation and gradual functional recovery. Lifestyle modifications, including activity pacing and low-intensity graded exercise, are commonly recommended. Cognitive behavioral therapy may help patients cope with fatigue and improve functional outcomes. Assessment and management of associated autonomic dysfunction may further aid symptom control.[1]

Post-Viral Sleep Disorders

Post-viral sleep disorders are increasingly recognized as significant sequelae following acute viral infections. Many individuals recovering from viral illnesses report persistent sleep disturbances, often accompanied by chronic fatigue and reduced quality of life. Evidence from survivors of Severe Acute Respiratory Syndrome (SARS) demonstrated notable abnormalities in sleep architecture, including increased arousal disturbances and the presence of abnormal electroencephalographic alpha frequency patterns in nearly half of patients undergoing polysomnography. More recently, infection with SARS-CoV-2 has also been strongly associated with sleep-related complications. Previously healthy individuals have been reported to develop conditions such as sleep apnea following COVID-19, which may impair restorative sleep and prolong recovery. Polysomnographic studies in post-COVID

patients have further identified abnormalities such as rapid eye movement (REM) sleep without atonia, suggesting neurological involvement in post-viral sleep dysregulation. Other viral infections affecting the central nervous system have demonstrated similar long-term effects. Tick-borne encephalitis virus, which causes inflammation in regions including the brainstem, thalamus, and spinal cord, has been linked to persistent fatigue and poorer sleep-related quality of life compared to healthy populations. Additionally, sleep disturbances have been described in cases of viral encephalitis, where patients exhibited fragmented sleep–wake cycles and disrupted non-REM and REM ultradian rhythms on polysomnography. These findings collectively highlight that viral infections can induce lasting neurophysiological alterations that impair sleep regulation and contribute to the broader clinical spectrum of post-viral syndrome.[20]

Diagnosis and Treatment of Post-Viral Sleep Disorders

Post-viral sleep problems lack clear diagnostic criteria, just as post-viral discomfort and post-viral exhaustion.

Additionally, there are no precise therapy recommendations for post-viral sleep disturbances; instead, individuals are treated according to how they appear. Automated positive airway pressure therapy was found to be an effective treatment for new-onset sleep apnea in a case series of post-COVID-19 patients. In all instances of post-COVID-19 tiredness syndrome, the authors recommended that sleep apnea be included in the differential diagnosis. Post-viral sleep disturbances may also be treated with behavioral sleep management techniques including CBT for insomnia (CBT-I) and brief behavioral therapy for insomnia (BBTI). These short therapies concentrate on altering sleep-related behaviors and, in the case of CBT-I, on sleep-interfering thoughts. Both CBT-I and BBTI are known to be effective. Additionally, these treatments work well for treating sleep disorders in those with complicated medical conditions, such as persistent discomfort. Further investigation is necessary to identify the unique factors that must be taken into account while treating sleep problems in people with different PVSs.[21]

Management of post viral syndrome

For both severe and mild-to-moderate cases, the guidelines suggest that all patients undergo a clinical evaluation and symptom-based follow-up.

Once serious ongoing complications or comorbidities have been ruled out, and until long-term follow-up study results are available, patients should be managed in a practical and

symptom-focused manner, emphasizing holistic support while avoiding excessive investigation. For instance, fever can be addressed with paracetamol or non-steroidal anti-inflammatory drugs. Assessing functional status in post-acute viral cases patients is not yet precise. A post-viral functional status scale has been pragmatically developed but lacks formal validation. Most patients do not appear to require referral to a specialist rehabilitation service, as they can generally expect a gradual, albeit sometimes slow, improvement in energy levels and breathlessness, supported by careful pacing, prioritization, and setting modest goals. In our experience, most patients who were not hospitalized recover well with four to six weeks of light aerobic exercise, such as walking or Pilates, gradually increasing in intensity as tolerated. Those returning to work may need assistance in negotiating a phased return. [16,9]

Respiratory symptoms and support

Cough

The British Thoracic Society characterizes a chronic cough as one lasting more than eight weeks. Until that point, and in the absence of signs of super-infection or complications like painful pleural inflammation, managing a cough is often most effective with simple breathing control exercises and, when necessary, medication such as proton pump inhibitors if reflux is suspected. The diaphragm is responsible for about 80% of the work involved in breathing. Following illness or general physical decline, the breathing pattern may change, leading to reduced diaphragmatic movement and increased reliance on accessory muscles in the neck and shoulders. This can cause shallow breathing, which in turn leads to increased fatigue, breathlessness, and energy consumption. The "breathing control" technique is designed to normalize breathing patterns and enhance the efficiency of respiratory muscles, including the diaphragm, thereby reducing energy use, airway irritation, fatigue, and improving breathlessness. Patients should sit in a supported position and breathe slowly in through the nose and out through the mouth, relaxing the chest and shoulders while allowing the abdomen to rise. They should aim for an inspiration to expiration ratio of 1:2. This technique can be practiced frequently throughout the day in 5-10 minute sessions, or longer if beneficial. Other breathing techniques, such as diaphragmatic breathing, slow deep breathing, pursed lip breathing, yoga techniques, and Buteyko, are also used to manage patients' breathing patterns and breathlessness, but require specialist advice to determine the most suitable technique for each patient.[22]

Breathlessness

Experiencing some level of breathlessness is typical following acute PVS. Severe breathlessness, which is uncommon in patients who were not hospitalized, might necessitate urgent medical attention. Breathing exercises often help alleviate breathlessness. Pulse oximeters can be very helpful for evaluating and tracking respiratory symptoms post-viral, and there is no evidence suggesting that their use at home increases anxiety. Patients should be equipped with a pulse oximeter and an observation diary, along with instructions on how to self-monitor. Typically, this involves taking a daily reading on a clean, warm finger without nail polish, after resting for 20 minutes; the device should be allowed to stabilize, and the highest reading should be recorded. While oxygen saturation probes available from healthcare suppliers and pharmacies generally function within normal ranges (92% and above), smartphone apps claiming to measure oxygen saturation using the phone camera and flashlight should be avoided. Recovery from any severe debilitating illness can be prolonged. Survivors of COVID-19 acute respiratory distress syndrome may face long-term lung function impairment. Serious interstitial lung disease appears to be rare in patients who are not hypoxic, although long-term outcome data is not yet available.[22]

Pulmonary rehabilitation

In the initial six weeks following an acute viral infection, many patients experience spontaneous recovery and typically do not need immediate access to a pulmonary rehabilitation program. However, individuals who have suffered from severe respiratory illness might find pulmonary rehabilitation beneficial. This type of rehabilitation is described as “a multidisciplinary intervention based on personalized evaluation and treatment which includes, but is not limited to, exercise training, education, and behavioral modification designed to improve the physical and psychological condition of people with respiratory disease.” In the context of COVID-19, rehabilitation is being provided through various virtual methods, such as video-linked classes and home education booklets supplemented with telephone support.[23]

Fatigue

The intense and lasting fatigue experienced by some patients after a viral infection resembles chronic fatigue syndrome, which has been noted following other serious infections like SARS, MERS, and community-acquired pneumonia. We did not find any published research evidence on the effectiveness of either pharmacological or non-pharmacological treatments

for fatigue after a viral infection. Resources for patients on managing fatigue and guidance for clinicians on resuming exercise and a graded return to performance for athletes in COVID-19 are currently based on indirect evidence. There is considerable debate and controversy regarding the role of graded exercise in chronic fatigue in general and specifically in COVID-19. Until direct evidence from research studies is available, we recommend that exercise for such patients should be approached cautiously and reduced if the patient experiences fever, breathlessness, severe fatigue, or muscle aches. Support, understanding, and reassurance from the primary care clinician are essential components of management.[23]

Cardiopulmonary complications, assessment and management

Approximately 20% of patients hospitalized with a viral infection exhibit significant cardiac involvement, with hidden cases potentially being even more prevalent. Cardiopulmonary issues such as myocarditis, pericarditis, myocardial infarction, dysrhythmias, and pulmonary embolism can manifest several weeks following acute COVID-19. These complications are more frequent in individuals with existing cardiovascular conditions, but they have also been observed in young, previously healthy individuals. Proposed pathophysiological mechanisms include viral infiltration, inflammation, microthrombi, and the down-regulation of ACE-2 receptors.[22]

Chest pain

Chest pain is a common symptom after a viral infection. The main clinical goal is to distinguish between musculoskeletal and other non-specific chest pain (such as the "lung burn" described in a large patient-led survey) and serious cardiovascular issues. Evaluating chest pain in patients recovering from a viral infection should follow the same principles as any chest pain assessment: a thorough history, consideration of past medical history and risk factors, a physical examination, and, if necessary, further investigations (infographic). If the diagnosis is unclear or the patient is critically ill, an urgent referral to a cardiologist may be required for specialized evaluation and tests, including echocardiography, chest computed tomography, or cardiac magnetic resonance imaging.

Thromboembolism

Viral infections are characterized by inflammation and a heightened tendency for blood clotting, leading to a greater likelihood of thromboembolic incidents. Post-discharge anticoagulation guidelines differ, but patients at higher risk are often sent home with a 10-day

course of extended thromboprophylaxis. If a thrombotic event is identified, standard protocols for anticoagulation, along with further investigation and monitoring, should be followed.

Neurological sequelae

Neurological consequences such as ischemic stroke, seizures, encephalitis, and cranial neuropathies have been reported following viral infections, though they appear to be uncommon. Patients suspected of having these severe complications should be referred to a neurologist. Common, non-specific neurological symptoms, often accompanying fatigue and shortness of breath, include headaches, dizziness, and cognitive impairment, commonly referred to as "brain fog." Until evidence-based guidelines are available for managing or referring these symptoms, we suggest supportive care and monitoring in primary care settings.[23]

Mental health and wellbeing

Most studies on post-viral mental health have highlighted individual responses to the pandemic, such as anxiety, stress, and issues stemming from disrupted routines, loneliness, and social isolation in those not infected. The World Health Organization has provided guidance on these matters. Anecdotal evidence indicates that post-acute viral infection is frequently linked to low mood, feelings of hopelessness, increased anxiety, and sleep disturbances. Post-traumatic stress disorder may develop, particularly in healthcare workers and caregivers. While some patients may benefit from mental health service referrals, it is crucial not to pathologize the majority. Physical symptoms of viral infections can skew responses to assessment tools (like the PHQ9) designed for evaluating anxiety and depression in physically healthy individuals, although these complications can occur. Patient organizations stress the importance of well-being, mindfulness, social connections, self-care (including diet and hydration), peer support, and symptom management. Mental illness is closely linked to social factors such as poverty, discrimination, and social exclusion; mental health and well-being are improved by greater social solidarity, informal support networks, mutual aid, and other community-based and collective initiatives. Given the widespread and unequal impact of COVID-19, community-level, cross-sector collaborations may be necessary to create locally relevant solutions. A recent report from a general practice in a deprived area of Glasgow highlights the significance of accessible, relationship-based care

for patients with complex needs, as well as system-level interventions like financial advisors and outreach mental health services.[23]

Prognosis

The prognosis of post-viral syndrome remains highly variable and continues to be an area of ongoing investigation. There is a relative scarcity of large-scale, prospective, and long-term population-based studies evaluating the prevalence, natural history, and recovery outcomes of unexplained post-viral syndromes. This limitation makes it challenging to accurately predict disease trajectory or establish standardized prognostic markers. Variability in diagnostic criteria, symptom definitions, and study methodologies further complicates the interpretation and comparison of outcomes across different cohorts. Despite these challenges, existing evidence suggests that recovery patterns differ widely among affected individuals and are influenced by multiple host and disease-related factors, including age, sex, comorbid conditions, immune response, and the severity of the initial viral infection.

Although many patients gradually see their symptoms improve over a period of weeks to months, some continue to experience ongoing issues such as fatigue, shortness of breath, sleep problems, cognitive difficulties, and musculoskeletal pain for longer durations. Studies of post-viral groups, especially after the COVID-19 pandemic, have shown that these lingering symptoms can occur regardless of how severe the initial illness was, with even those who were not hospitalized developing long-term effects. Furthermore, new symptoms can arise during the recovery phase, including neuropsychiatric and autonomic issues, highlighting the complex and changing nature of post-viral recovery.

There are also concerns about the potential overlap between post-viral syndrome and post-intensive care syndrome in patients who were previously hospitalized, which can complicate the assessment of outcomes. However, the similar persistence of symptoms in both ICU and non-ICU survivors indicates that extended recovery is not exclusive to those who were critically ill. In general, while many people eventually return to their normal level of functioning, the unpredictable nature, varying symptom load, and potential development into chronic fatigue conditions underscore the importance of long-term monitoring, multidisciplinary rehabilitation, and ongoing research to better understand prognostic factors and improve recovery outcomes.

Overall, the prognosis of post-viral syndrome is heterogeneous and influenced by a complex interplay of host, viral, and environmental factors. However, many patients demonstrate gradual recovery with supportive care and rehabilitation, a notable proportion experience

prolonged or fluctuating symptoms that may impact long-term functional capacity and quality of life. The absence of standardized prognostic markers and long-term population data underscores the need for continued clinical monitoring and research. Early recognition, multidisciplinary management, and individualized rehabilitation strategies remain essential in optimizing recovery outcomes for affected individuals.[24]

Prevention of PVS

Preventive measures for post-viral syndrome focus on effectively managing the initial viral infection and ensuring sufficient recovery time to facilitate complete physiological healing. Patients are advised to refrain from resuming intense physical or work-related activities too soon, as this can worsen fatigue and delay recovery. Ensuring adequate rest, maintaining a balanced diet, staying hydrated, and practicing good sleep habits are crucial for restoring the immune system and repairing tissues after a viral illness. Vaccination against viruses is important in lessening the severity of diseases and may reduce the likelihood of long-term post-infectious complications. Recognizing ongoing symptoms like fatigue, shortness of breath, or cognitive issues early on allows for prompt supportive care, including gradual rehabilitation, breathing exercises, and psychological assistance. Raising public health awareness, educating patients, and providing structured follow-up care also help in reducing the development of chronic symptoms and enhancing long-term recovery for those recuperating from viral infections.[23]

Quality of life impact

Impact on quality of life. Post-viral syndrome can significantly affect an individual's overall quality of life, impacting physical, psychological, and social aspects of functioning. Ongoing symptoms such as fatigue, muscle and joint pain, shortness of breath, and sleep issues often restrict daily activities and decrease independence. Many individuals find it challenging to return to their pre-illness levels of work productivity, academic achievement, and routine household tasks. Cognitive difficulties, often referred to as “brain fog,” along with decreased focus and memory problems, can further hinder work performance and decision-making abilities. Besides physical limitations, the chronic and variable nature of symptoms can lead to emotional distress, anxiety, depression, and social isolation. Prolonged illness may also put a strain on personal relationships and financial stability due to reduced work capacity and increased healthcare demands. These factors collectively emphasize that post-viral syndrome

is not just a lingering medical issue but a complex health challenge that requires comprehensive rehabilitation and psychosocial support to restore overall well-being.[9]

CONCLUSION

Post-viral syndrome represents a complex and multifaceted clinical entity characterized by the persistence of systemic, neurological, and functional symptoms following recovery from acute viral infections. Although historically recognized after infections such as influenza, Epstein–Barr virus, dengue, and chikungunya, the global emergence of the COVID-19 pandemic has significantly amplified awareness and research interest in post-viral sequelae. The syndrome encompasses a broad spectrum of manifestations, including fatigue, chronic pain, sleep disturbances, cognitive dysfunction, autonomic imbalance, and psychological distress, all of which may profoundly impair daily functioning and quality of life.

The pathogenesis of post-viral syndrome remains incompletely understood and is likely driven by an interplay of immune dysregulation, chronic low-grade inflammation, autonomic nervous system dysfunction, mitochondrial impairment, and neuroinflammatory mechanisms. The absence of definitive biomarkers and standardized diagnostic criteria continues to pose challenges in clinical recognition and research standardization. Consequently, diagnosis remains largely clinical and based on symptom persistence following exclusion of alternative medical or psychiatric etiologies.

Management strategies are predominantly supportive and multidisciplinary, focusing on symptom alleviation, functional rehabilitation, and psychological support. Interventions such as graded activity pacing, pulmonary rehabilitation, cognitive behavioral therapy, and individualized care plans play a pivotal role in recovery. Importantly, the prognosis varies widely, with many patients experiencing gradual improvement, while others endure prolonged or relapsing symptoms that necessitate long-term follow-up and rehabilitation.

Preventive measures, including optimal management of acute infections, adequate convalescence, vaccination, and early symptom recognition, may reduce the risk of chronic sequelae. As research continues to evolve, a deeper understanding of biological mechanisms and therapeutic targets is anticipated. Future large-scale longitudinal studies are essential to establish prognostic markers, refine diagnostic frameworks, and develop evidence-based treatment protocols.

In conclusion, post-viral syndrome represents an emerging public health concern with significant clinical and socioeconomic implications. A holistic, patient-centered, and

multidisciplinary approach remains fundamental in improving functional outcomes, restoring quality of life, and addressing the long-term burden of post-infectious illnesses.

REFERENCES

1. Tackey C, Slepian PM, Clarke H, Mittal N. Post-Viral Pain, Fatigue, and Sleep Disturbance Syndromes: Current Knowledge and Future Directions. *Can J Pain*. 2024 Jan 9;7(2):2272999. doi: 10.1080/24740527.2023.2272999. PMID: 38239826; PMCID: PMC10795785.
2. Perrin R, Riste L, Hann M, Walther A, Mukherjee A, Heald A. Into the looking glass: Post-viral syndrome post COVID-19. *Med Hypotheses*. 2020 Nov;144:110055. doi: 10.1016/j.mehy.2020.110055. Epub 2020 Jun 27. PMID: 32758891; PMCID: PMC7320866.
3. Medical News Today. Post-viral syndrome: Symptoms, causes, and treatment approaches [Internet]. Brighton (UK): Medical News Today; 2024 [cited 2026 Jan 6].
4. Southern Medical Association. Post-viral syndrome overview: Persistent symptoms following viral infections [Internet]. Birmingham (AL): Southern Medical Association; 2024 [cited 2026 Jan 6].
5. Hickie I, Davenport T, Wakefield D, et al. Post-infective and chronic fatigue syndromes precipitated by viral and non-viral pathogens: prospective cohort study. *BMJ*. 2006;333(7568):575.
6. Institute of Medicine. Beyond Myalgic Encephalomyelitis/Chronic Fatigue Syndrome: Redefining an Illness. National Academies Press; 2015.
7. White PD, Thomas JM, Kangro HO, et al. Predictions and associations of fatigue syndromes and mood disorders that occur after infectious mononucleosis. *Lancet*. 2001;358(9297):1946–1954.
8. Seet RC, Quek AM, Lim EC. Post-infectious fatigue syndrome in dengue infection. *J Clin Virol*. 2007;38(1):1–6.
9. Nalbandian A, Sehgal K, Gupta A, et al. Post-acute COVID-19 syndrome. *Nat Med*. 2021;27(4):601–615.
10. Komaroff AL, Bateman L. Will COVID-19 lead to myalgic encephalomyelitis/chronic fatigue syndrome? *Front Med*. 2021;7:606824.
11. Wirth K, Scheibenbogen C. A unifying hypothesis of the pathophysiology of myalgic encephalomyelitis/chronic fatigue syndrome. *Front Med*. 2021;8:580923.

12. NICE Guideline. Myalgic encephalomyelitis (or encephalopathy)/chronic fatigue syndrome: diagnosis and management. 2021.
13. Archer MI. The post-viral syndrome: a review. *J R Coll Gen Pract.* 1987 May;37(298):212-4. PMID: 3320358; PMCID: PMC1710789.
14. Campos MC, Nery T, Starke AC, de Bem Alves AC, Speck AE, S Aguiar A. Post-viral fatigue in COVID-19: A review of symptom assessment methods, mental, cognitive, and physical impairment. *NeurosciBiobehav Rev.* 2022 Nov;142:104902. doi: 10.1016/j.neubiorev.2022.104902. Epub 2022 Oct 3. PMID: 36202253; PMCID: PMC9528075.
15. Choutka J, Jansari V, Hornig M, Iwasaki A. Unexplained post-acute infection syndromes. *Nat Med.* 2022;28(5):911-23.
16. Fowler-Davis S, Platts K, Thelwell M, Woodward A, Harrop D. A mixed-methods systematic review of post-viral fatigue interventions: Are there lessons for long Covid? *PLoS One.* 2021 Nov 9;16(11):e0259533. doi: 10.1371/journal.pone.0259533. PMID: 34752489; PMCID: PMC8577752.
17. Foster J. Understanding Long-Term Effects of Viral Infections: Epidemiological Insights into Post-Infection Syndromes. *Insight into Epidemiology.* 2024 Oct 30;1(1).
18. Attal N, Martinez V, Bouhassira D. Potential for increased prevalence of neuropathic pain after the COVID-19 pandemic. *Pain Rep.* 2021 Jan 27;6(1):e884. doi: 10.1097/PR9.0000000000000884. PMID: 33537521; PMCID: PMC7850724.
19. Simon F, Javelle E, Cabie A, Bouquillard E, Troisgros O, Gentile G, Leparac-Goffart I, Hoen B, Gandjbakhch F, Rene-Corail P, et al. French guidelines for the management of chikungunya (acute and persistent presentations). November 2014. *Med Mal Infect.* 2015 Jul;45(7):243–63. doi:10.1016/j.medmal.2015.05.007.
20. Sher L. Post-COVID syndrome and suicide risk. *QJM.* 2021 Apr 27;114(2):95-98. doi: 10.1093/qjmed/hcab007. PMID: 33486531; PMCID: PMC7928695.
21. Koczulla AR, Stegemann A, Gloeckl R, Winterkamp S, Szczepanski B, Boeselt T, Storre J, Dreher M. Newly detected rapid eye movement associated sleep apnea after coronavirus disease 2019 as a possible cause for chronic fatigue: two case reports. *J Med Case Rep.* 2021 Apr 22;15(1):211. doi: 10.1186/s13256-021-02819-0. PMID: 33888154; PMCID: PMC8061449.
22. British Thoracic Society. British Thoracic Society guidance on respiratory follow up of patients with a clinico-radiological diagnosis of COVID-19 pneumonia. 2020.
23. Greenhalgh T, Knight M, A'Court C, Buxton M, Husain L.

24. Management of post-acute COVID-19 in primary care. *BMJ*. 2020; 370: m3026.
25. Nair C, Moni M, Edathadathil F, A A, Prasanna P, Pushpa Raghavan R, Sathyapalan D, Jayant A. Incidence and characterization of post-COVID-19 symptoms in hospitalized COVID-19 survivors to recognize syndemic connotations in India: single-center prospective observational cohort study. **JMIR Form Res.** 2023; 7: e40028. doi: 10.2196/40028.