Review

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Clinical Features, Management, and Long-Term Outcomes of Chikungunya in Adult Population: A Scoping Review

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Clinical Features, Management, and Long-Term Outcomes of Chikungunya in Adult Population: A Scoping Review

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Abstract

Chikungunya poses a tough challenge because of its varied symptoms and frequent misdiagnosis. Inappropriate treatment can affect long-term patient outcomes. This review aims to identify clinical features, current management and therapeutic strategies, and long-term clinical outcomes of Chikungunya disease. This scoping review, reported according to the JBI and PRISMA-ScR guidance. This study was conducted from three databases as primary data sources and several of gray literatures. From 19 studies were included in this review, fever and joint symptoms were reported as the main clinical features of acute Chikungunya infection, which may persist and become chronic, then affecting the patient's quality of life. The primary management of Chikungunya infection, include symptomatic and long-term therapy. Preventions and public health management also play a role. In conclusion, most cases of Chikungunya may improve with treatment, but some have long-term complications that require rehabilitation, support, prevention, and public health management.

Keywords: chikungunya; adult; tropical regions; endemic; epidemic; clinical features; management strategies; long-term outcomes; scoping review

1. Introduction

The global resurgence of the Chikungunya virus (CHIKV) in the mid-2020s has fundamentally altered the clinical and epidemiological landscape of mosquito-borne diseases [1]. Chikungunya poses a particularly tough challenge because it has a high rate of varies symptomatic cases, that frequent misdiagnosis of as dengue or Zika. Many patients progress from an initial fever to a long-lasting, debilitating illness; particularly in adults, represents the primary global workforce, making the long-term sequelae of Chikungunya influence a significant quality of life (QoL) [2]. Unlike many other febrile illnesses that resolve completely, approximately 40% to 50% of adults infected with Chikungunya virus (CHIKV) progress to chronic Chikungunya disease, characterized by persistent inflammatory rheumatism that can last for years [2]. This chronic condition can lead to prolonged illness, reduced productivity, and marked decline in health-related quality of life (HRQoL) [3]. The psychological dimension of the disease, specifically the increased risk of depression and anxiety in chronic patients, has been identified in research in 2024 and 2025 as a critical but underserved area of clinical practice [3].

Previous reviews summarized Chikungunya until 2018, but none have comprehensively examined clinical features, management, and long-term outcomes specifically in adult populations, particularly in tropical and endemic regions or epidemic-prone regions with documented local transmission. In addition, existing publications focus mainly on separate aspects of the disease and are still limited in their updates, which are highly heterogeneous and fragmented. This scoping review seeks to clarify the current state of knowledge update and identify critical gaps that remain in the pathway by providing an integrated evidence map.

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This review aims to identify the variability of clinical features in conjunction with the refinement diagnosis, identify current management and therapeutic strategies, and long-term clinical outcomes, which may help reduce misdiagnosis and provide effective management to improve long-term outcomes based on updated evidence.

2. Methods

2.1. Protocol

This review was conducted as a scoping review in accordance with the Joanna Briggs Institute (JBI) methodology and was reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR) guidance [4,5]. This protocol was registered on the Open Science Framework (OSF) before data synthesis (DOI: **10.17605/OSF.IO/43YJW**). Minor deviations from the registered protocol were made, including the refinement of eligibility criteria to improve inclusivity. These modifications did not alter the fundamental objectives of the review and are documented in the OSF project.

2.2. Eligibility Criteria

This scoping review was conducted based on population, concept, and context (PCC) framework (Table 1). Sources of evidence were included if they met the following criteria: (1) adult ($\geq$ 18 years) with with clinical and/or laboratory-confirmed Chikungunya infection; (2) Reported at least one of clinical manifestations or management strategies or long-term outcomes of Chikungunya; (3) The study was conducted in tropical, endemic or epidemic-prone regions with documented local transmission of the Chikungunya virus; (3) The type of evidence included observational studies (cohort, cross-sectional, case-control, surveillance studies) as the primary study and relevant clinical practice guidelines; (4) Full-text articles published in English. Studies describing clinical manifestations of laboratory-confirmed Chikungunya infection, including both descriptive or analytical, were eligible for inclusion. Studies were excluded if they: (1) focused exclusively on pediatrics, newborns, or pregnant; (2) No clinical aspect, management or outcomes was reported; (3) Study was designed as in vitro study; (3) Editorial, commentary, opinion, letter to editor, or conference, review studies.

2.3. Data Source and Search Strategy

This scoping review was conducted from three databases for primary studies, including PubMed, ScienceDirect, and Willey Online Library. Database-specific search strategies were developed using relevant keywords and Boolean operators were applied, with the search intentionally broad in line with scoping review methodology. Detail search terms for each database are reported in the Supplementary table (Table S1).

In addition to primary studies, a targeted gray literature search was conducted to identify relevant management strategies of Chikungunya in adult from official websites of international and national health organizations, including the World Health Organization (WHO), the Centers for Disease Control and Prevention (CDC), the Pan American Health Organization (PAHO), and guideline of the Ministry of Health of the Republic of Indonesia, using the following keywords were searched on a manual internal search website, including chikungunya management; chikungunya treatment; chikungunya clinical guidance; chikungunya guideline.

2.4. Study Selection

All records identified through the database search were imported into reference management software, and duplicates were removed before screening. The title and abstract were independently selected by two authors to assess eligibility according to predefined criteria. Full-text articles were then retrieved and evaluated for final inclusion. Any disagreements were resolved through discussion, with the consultation of a third author when necessary.

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2.5. Data Charting

Data charting was conducted independently by two authors using a standardized form based on eligibility criteria. Any discrepancies resolved by discussion or consultation with the third author. Missing or unclear data were not imputed and recorded as not reported.

Data were extracted into study characteristics, population characteristics, diagnostic methods, clinical manifestations, management strategies, and long-term outcomes. This data extraction was performed using an AI-assist tool, specifically NotebookLM, and then the data was organized into a Microsoft Excel worksheet. Critical assessment/appraisal of the included studies is not mandatory, as this scoping review aimed to map available evidence rather than to assess methodological quality, this is in line with JBI methodology and PRISMA-ScR guidance.

2.6. Data Synthesis

The charted data were synthesized descriptively using tabulation and narrative synthesis to map the data thematically. In cases where the terminology or the definitions of the outcomes varied between studies; the data were grouped into broader categories for descriptive synthesis, to highlight common patterns, variations,and gaps in the literature. No quantitative synthesis or meta-analysis was undertaken.

Table 1. Population, concept, and context (PCC) framework.

PCC framework	Description
Population	Adult ($\geq$ 18 years) with Chikungunya infection
Concept	Clinical features, management, long-term outcomes
Context	Tropical, endemic, or epidemic-prone regions with documented local transmission of Chikungunya virus

3. Results

3.1. Study Selection and Dataset Characteristics

A total of 84 studies were identified in the initial search of data sources, consisting of 77 primary studies from three databases, five studies from organizational websites, and two sources obtained from citations. After removing duplicates, 74 primary studies were included for title and abstract screening; 29 of these 74 studies were excluded in this screening; 45 reports were selected for retrieval; and 29 studies were evaluated in full-text screening; in total, 12 of the 29 primary studies were ultimately included in this review. Data sources from the gray literature included data from organizational websites and citations; a total of seven reports were sought for retrieval and assessed for eligibility, with none excluded. Thus, 19 studies were finally included in this scoping review. The study selection process is summarized in the PRISMA-Scr flow diagram (Figure 1), and the characteristics of the included evidence are summarized in Table 2. Raw data extractions are presented in Supplementary materials into spreadsheets (Spreadsheets S2).

3.2. Chikungunya Identification and Diagnosis

From 12 primary studies, Chikungunya was diagnosed according to diagnostic criteria, including serological laboratory tests and clinical symptoms. Nine of these studies used diagnostic criteria for Chikungunya based only on serological test results, while the other three studies used a combination of clinical and serological diagnostic criteria. Serological testing was based on positive *reverse transcription polymerase chain reaction* (RT-PCR) results or the presence of IgM and IgG antibodies. The primary clinical symptom serving as a key indicator in diagnostic criteria was fever.

One study describes the classification of chikungunya infection, including criteria for possible acute Chikungunya, probable acute Chikungunya, recent Chikungunya virus (CHIKV) infection and non-CHIKV infection with persistent IgM. Another study discusses screening methods for chikungunya infection prior to establishing a diagnosis. In addition, this review also includes studies that

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evaluate the chronic progression of chikungunya infection, specifically based on serological confirmation of chikungunya infection, as well as viral clearance or neutralizing antibodies to evaluate viral infection—a critical factor in assessing long-term outcomes of chikungunya virus infection.

3.3. Clinical Features, Management, Outcomes Findings of Chikungunya

Ten studies described the clinical features of Chikungunya, including five studies focusing on acute cases and one study on chronic case, with four studies reporting both acute and chronic symptoms. The clinical features of Chikungunya predominantly include fever and rheumatic symptoms. A study reported on differences in the clinical features of acute Chikungunya based on the number of concurrent arbovirus infections that occur with Chikungunya infection; these include mono-infection and dual-infection (primarily Zika and Chikungunya), particularly regarding neurological symptoms.

Management of Chikungunya was primarily reviewed based on gray literature, including clinical management of Chikungunya infection and prevention or public health strategies. Several databases studies were also included as an emerging therapy or a new strategy to prevent Chikungunya infection.

The outcome findings of Chikungunya, include long-term outcomes in follow-up three months or later after acute infection. 11 studies were reported on these long-term outcomes, predominantly associated with an impact on quality of life, often resulting in the onset of psychological consequences.

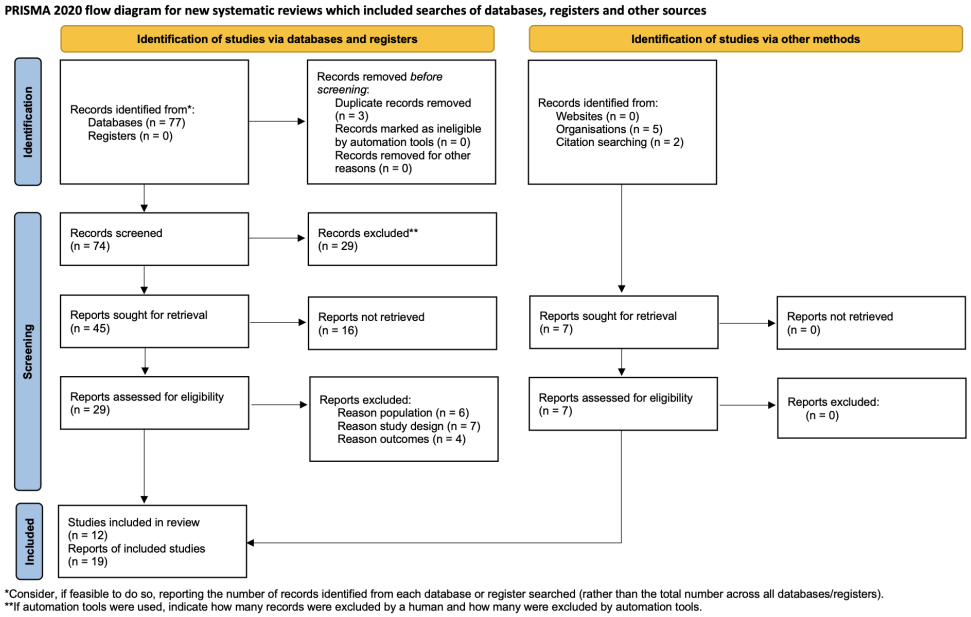

Figure 1. PRISMA-Scr flow diagram.

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Table 2. *Cont.*

Author/Organization (Year)	Ref.	Country/Region	Document type	Study design	Focus study	Key findings
Arif, et al. (2020)	[6]	Indonesia	Primary study	Multi-site observational cohort study	Clinical features	All strains of acute CHIKV were Asian genotype—while it remains need for better diagnostics.
Cavalcante et al. (2024)	[7]	Brazil	Primary study	Randomized, double-blind, sham-controlled clinical trial	Management strategy	Anodal tDCS reduced pain versus sham but did not improve physical function; no serious adverse effects were observed.
Brito Ferreira et al. (2020)	[8]	Brazil	Primary study	Prospective observational study	Clinical features, management strategy, long-term outcomes	The study compared CNS and PNS presentations, assessed disease severity and outcomes, and evaluated the impact of dual infections on clinical spectrum and severity.
Mwanyika, et al. (2021)	[9]	Tanzania	Primary study	Cross-sectional study utilizing a multistage cluster design	Clinical features	Older age, frequent mosquito bites, stagnant/piped water, fever, and mine visits were linked to higher CHIKV seropositivity; widespread asymptomatic community transmission.

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Table 2. *Cont.*

Author/Organization (Year)	Ref.	Country/Region	Document type	Study design	Focus study	Key findings
Dutra, et al. (2024)	[3]	Brazil	Primary study	Cross-sectional and comparative study	Management strategy, long-term outcomes	One year post-infection, significantly impaired daily functioning, walking ability, mental health, quality of life, and autonomy compared to healthy individuals.
Doran, C., et al. (2022)	[10]	Curaçao	Primary study	Prospective cohort study	Management strategy, long-term outcomes	At 2.5 years, patients continued to have symptoms, reduced physical and mental quality of life; CLTCS effectively identified those needing multidisciplinary care.
Ren, Z., et al. (2026)	[11]	China	Primary study	Retrospective hospital cohort study	Clinical features, long-term outcomes	Older age and comorbidities are associated with worse lab results, longer illness, higher viral loads, and more symptoms at discharge.
Wang, Z., et al. (2025)	[12]	China	Primary study	Retrospective observational study	Clinical features, long-term outcomes	Longer recovery was linked to higher liver enzymes, older age, lasting joint pain and rash, and slower viral clearance.

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Table 2. *Cont.*

Author/Organization (Year)	Ref.	Country/Region	Document type	Study design	Focus study	Key findings
Babu, N., et al. (2023)	[13]	India	Primary study	Cross-sectional study involving longitudinal follow-up	Clinical features, long-term outcomes	Severe Chikungunya had a high pro-inflammatory cytokines with persistent joint pain; neutralizing responses rose during recovery, and faster viral strains were more pathogenic.
Reshma RS, et al. (2021)	[14]	India	Primary study	Cross-sectional study	Clinical features, long-term outcomes	During the outbreak, fever was the primary symptom with joint involvement mainly affecting the knees; leucopenia is common with an inverse WBC–CRP correlation.
Imad, H. A., et al. (2021)	[15]	Maldives	Primary study	Prospective study	Clinical features	Fever and joint symptoms were most common; higher viremia correlated with severe adult disease.
Yoon, et al. (2020)	[16]	Philippines	Primary study	Longitudinal cohort study	Clinical features, long-term outcomes	Pre-existing CHIKV neutralizing antibodies (PRNT80 $\geq$ 1:10) provided strong, supporting their use as a surrogate endpoint in vaccine development.

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Table 2. *Cont.*

Author/Organization (Year)	Ref.	Country/Region	Document type	Study design	Focus study	Key findings
World Health Organization (2025)b	[17]	Global	Guideline	Clinical practice guideline	Management strategy	Oral rehydration and paracetamol are suggested for mild cases; Severe cases require IV fluids and monitoring; Vector control, readiness for outbreaks.
World Health Organization (2008)	[18]	South-East Asia	Guideline	Clinical management guideline	Management strategy	Chikungunya is treated with paracetamol for symptoms, targeted therapy for chronic issues, and prioritizes vector control, personal protection, and public health reporting to reduce transmission.
Pan American Health Organization (2022)	[19]	American of Tropical-endemic region	Guideline	Evidence-based clinical practice guideline	Management strategy	Early paracetamol is recommend use for symptoms and incorporates Chikungunya control.
Centers for Disease Control and Prevention (2026)	[20]	Tropical and subtropical regions worldwide	Guideline	Chapter from a clinical practice handbook	Management strategy	Paracetamol is first, NSAIDs or physical therapy for ongoing joint pain; no specific antiviral treatment; prevention focuses on mosquito avoidance and selective vaccination for at-risk travelers.

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Table 2. *Cont.*

Author/Organization (Year)	Ref.	Country/Region	Document type	Study design	Focus study	Key findings
Centers for Disease Control and Prevention (2025)	[21]	Global (primary in tropical and subtropical areas)	Guideline	Chapter from a clinical practice handbook	Management strategy	To prevent mosquito bites, use EPA-approved repellents, wear protective clothing, avoid peak Aedes activity, apply spatial repellents, and steer clear of outbreak areas.
Indonesian Ministry of Health Guidelines (2017)	[22]	Indonesia	Guideline	National clinical and public health guideline	Management strategy	Chikungunya treatment involves supportive care and physiotherapy; prevention includes integrated vector management and multisectoral efforts to halt transmission.
Pan American Health Organization (2026)	[23]	American of Tropical-endemic region	Guideline	Public Health Surveillance Report	Management strategy	Chikungunya control depends on enhanced surveillance, clinical readiness, community engagement, and integrated vector control for early detection and fast outbreak response.

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4. Discussion

4.1. Clinical Features of Chikungunya

According to the review findings, the clinical features of chikungunya are divided into two categories: acute (febrile phase) and chronic (follow-up phase). All infected with the Chikungunya virus (CHIKV) will experience the acute phase, but not all patients will experience chronic symptoms. In this review, the chronic phase is an advanced or sequelae clinical features after three months of follow-up that will influence long-term outcomes.

4.1.1. Acute Chikungunya

The clinical features of acute phase Chikungunya include clinical symptoms and non-diagnostic laboratory markers in the first 7–14 days. According to our review, the common symptoms of acute Chikungunya included rheumatic symptoms (arthralgia and myalgia) with high fever, followed by other systemic symptoms, such as rash, fatigue, headache, nausea, and a small number of patients with gastrointestinal symptoms and neurological disorders [6,8,9,11,14,16]. These symptoms were generally mild, but could vary according to age and comorbidity. The non-diagnostic laboratory in Chikungunya was related to viral infection-caused inflammation, included leucopenia, thrombocytopenia, and a higher C-reactive protein, indicating a negative correlation between hematologic profiles and inflammatory markers [6,11,14].

Arif et al. (2020) found that arthralgia is a common complaint among adults with high fever and generally normal blood counts, particularly in leukocyte and platelet counts, with the exception of occasional lymphopenia [6]. Mwanyika et al. (2021) identified the presence of IgG positive Chikungunya antibodies in acute high fever as the primary symptom of Chikungunya; however, a significant degree of viral circulation was also observed among asymptomatic cases [9]. This finding aligns with the study by Wang, Z., et al. (2025), who observed that fever often manifests abruptly and persists, while polyarthralgia predicts delayed viral clearance; myalgia leads to early morbidity, and persistent maculopapular rashes correlate with slower recovery [12]. A subsequent investigation by Reshma RS et al. (2021) revealed that body aches and headaches were prevalent during the first week of acute Chikungunya [14]. Furthermore, arthralgia persisted in the majority of patients after one week, with knee involvement predominant, followed by elbow, shoulder, and ankle [14]. According to the severity of acute Chikungunya, Reshma RS et al. (2021) found that advanced age was associated with increased joint swelling and greater severity [14]. Imad, H. A., et al. (2021) demonstrated that adults exhibited more severe arthritogenic manifestations (e.g., arthritis, joint stiffness, and joint swelling) and neurological manifestations (e.g., ataxia); with females are more likely to have bleeding and pruritus [15]. This was also reported by Ren, Z., et al. (2025), who found that older adults suffering from comorbidities experienced more severe disease [11].

Neurological disorders associated with acute Chikungunya infection can be differentiated by the presence or absence of co-infection, specifically as mono-infection or dual infection. Chikungunya mono-infection is primarily associated with inflammatory central nervous system (CNS) syndromes, notably myelitis, encephalitis, and cranial neuropathies, typically presenting with extended Guillain-Barré Syndrome (GBS) latency. In addition, dual infections—most frequently with the Zika virus—are linked to more severe and aggressive neurological manifestations, such as elevated risk of stroke, more intense forms of GBS that require intensive care, mixed encephalopathic presentations, and pronounced systemic symptoms [8]. In contrast, Babu, N., et al. (2023) reported rare symptoms of Chikungunya infection, including retro-orbital pain, photophobia, red eye, vomiting, cough, abdominal pain, lymphadenopathy, and edema; interestingly, rashes were observed in only a small number of participants (1.02%) [13].

4.1.2. Chronic Chikungunya

Most studies have reported that arthritis was commonly chronic. Arthritis does not always resolve after the acute phase and is often recurrent. Chronic arthritis included persistence of arthralgia,

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myalgia, and stiffness with or without persistence pain; it can persist or recur for months or even years, and in some cases, relapses may occur frequently. Babu, N., et al. (2023), found that persistent arthralgia as a large subset of patients did not achieve resolution within the expected 3–4 weeks, specifically 74.5% (35 of 47) patients who were followed one month after the onset of symptoms [13]. Persistent weakness, particularly in the lower extremities, was reported by Doran, C., et al (2022), and was independently associated with being highly affected by the disease [10].

Several studies identified predictors of prolonged disease, including older age, high viral load, severe acute symptoms, and comorbidities. These factors are associated with delayed viral clearance and increased complications. Persistent joint symptoms and elevated inflammatory markers have been associated with the progression from acute infection to chronic disease [11–13].

Along with the duration of patient symptoms, abnormal laboratory markers, including viral load and immune factors (e.g. cytokines and chemokines) were observed, reflecting the severity of Chikungunya. Babu et al. (2023) found that acute disease is associated with increased IFN-γ, IP-10, MCP-1, and growth factors, while persistent arthralgia involves ongoing pro-inflammatory markers (IL-6, IL-1β, IL-9, IP-10) and decreased anti-inflammatory markers (IL-4, IL-10) [13]. Stage-specific cytokine changes correlate with viral load, as faster-replicating isolates trigger stronger inflammatory responses [13]. Wang et al. (2025) reported that prolonged symptoms are associated with elevated liver enzymes (Aspartate Aminotransferase (AST) and Alanine Aminotransferase (ALT)), while creatinine kinase and neutrophil counts decrease over time [12]. No significant association was found between the duration or viral clearance of symptoms and white blood cell count (WBC), hemoglobin (Hb), platelet count, C-reactive protein (CRP) or prothrombin time (PT) [12]. In a study by Imad, H., et al. (2021), a higher creatinine, lower albumin, higher globulin, arthritis, elevated viremia and lymphopenia in adults, with mild liver enzyme elevations present in both adults and children [15]. Older adults with comorbidities experienced more severe complications, including cardiovascular, renal, and neurological problems. The higher initial viral load was correlated with the greater severity of the disease [13]; in contrast, adults without comorbidities had lower viral loads and cleared the virus faster than older adults with comorbidities (median 5 days vs 8 days) [11].

4.2. Management of Chikungunya

4.2.1. Management if Acute Chikungunya

A review of the gray literature shows that chikungunya management is currently supportive and symptomatic because there is no specific antiviral therapy [18,20]. Guidelines often classify cases as non severe (outpatient) or severe (hospitalized) to inform treatment strategies [17]. Non severe cases are managed with adequate hydration, rest, and symptomatic control. Paracetamol (acetaminophen) is widely recognized as the preferred initial treatment for fever and pain [18–20]. NSAIDs are generally contraindicated during the initial fever stage until dengue is ruled out due to the risk of hemorrhagic complications [17,20]. However, NSAIDs may be considered for patients with persistent, severe joint pain that is not adequately managed by paracetamol [19]. In cases requiring hospitalization, the provision of supportive care entails the administration of intravenous crystalloid solutions, monitoring of perfusion (capillary re-refill time), and a comprehensive hemodynamic assessment [17]. Adjunctive interventions, such as prophylactic platelet transfusions, immunoglobulins, and systemic corticosteroids, are generally not recommended due to a paucity of evidence demonstrating their effectiveness [17,19].

Various supportive measures have been identified as effective in addressing the condition, including adequate rest, increased fluid intake, and targeted joint care. This last component may involve the application of cold compresses to alleviate discomfort. According to the World Health Organization (2008), the use of aspirin and systemic steroids is generally discouraged during the acute phase of an illness due to their potential adverse effects [18]. National recommendations similarly emphasize symptomatic treatment, bed rest, and hydration as the mainstay of care [22].

According to study by Brito Ferreira et al. (2020), in cases of severity marked by the occurrence of neurological complications, the administration of additional pharmacological and supportive

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treatments may become indispensable [8]. Corticosteroids were the most frequently administered therapy, particularly in patients with central nervous system involvement, such as myelitis or acute disseminated encephalomyelitis. Intravenous immunoglobulin (IV IG) was a prevalent treatment for conditions such as Guillain–Barré syndrome (GBS), while antivirals such as acyclovir were administered empirically in encephalitis cases to exclude a potential co-infection by herpes simplex. In exceptional circumstances, anticonvulsants were necessary for the management of seizures. In certain cases, patients with severe neurological manifestations needed intensive care support, which included admission to intensive care unit (ICU) and mechanical ventilation, with a median hospitalization duration of approximately 17 days [8].

4.2.2. Management of Chronic Chikungunya

Chikungunya often leads to persistent symptoms, such as ongoing joint pain and inflammation, which can become severe or disabling for some people [17]. If initial treatments such as paracetamol do not help, NSAIDs can be used to manage joint pain and swelling in patients diagnosed with Chikungunya [17,19].

The management of chronic Chikungunya may involve several approaches. For persistent osteoarticular symptoms, short courses of nonsteroidal anti-inflammatory drugs (NSAIDs) and corticosteroids, as well as physiotherapy, have been demonstrated to be efficacious in alleviating symptoms and maintaining joint mobility [18,20,22]. In cases involving neurological complications, such as neuropathic pain, the World Health Organization (2008) recommends neuromodulating agents (e.g., amitriptyline, carbamazepine, or gabapentin) [18].

The provision of additional supportive management has been demonstrated to address dermatological manifestations and psychosocial effects, which have been observed in some patients and require treatment of symptoms and psychosocial support [18]. Current guidelines also underscore significant research gaps, particularly regarding the optimal utilization of disease-modifying antirheumatic drugs (DMARDs) and corticosteroids in chronic, Chikungunya-related arthritis [17,19].

4.2.3. Chikungunya Prevention and Public Health Strategy

A primary study by Doran et al. (2022), identified several strategies to address the long-term burden of chikungunya. The authors recommended the use of the Curaçao Long-Term Chikungunya Sequelae (CLTCS) score to help healthcare providers identify patients at high risk of severe quality-of-life impairment that require closer follow-up [10]. Furthermore, a central aspect of the strategy involved public health education to raise awareness of the possible long-term physical and psychological complications that can result from chronic Chikungunya. This emphasis was particularly pronounced in regions experiencing increasing prevalence rates of the condition [10].

A review of the gray literature indicates that the prevention of Chikungunya is mainly focused on minimizing human-mosquito contact and the control of Aedes mosquito populations. Vector control remains the most effective strategy to limit transmission [18,19]. Key preventive measures include the elimination of mosquito breeding sites, the improvement of environmental sanitation, and the promotion of personal protection, such as the use of insect repellents, the wearing of protective clothing, and the sleeping under mosquito nets—particularly during the viraemic phase to prevent further transmission [18,21,22]. Integrated vector management strategies, including household larval monitoring and community engagement, are also emphasized to reduce mosquito density and interrupt transmission cycles [22,23].

On a global scale, prevention efforts are supported by broader initiatives such as the Global Vector Control Response (2017–2030) and the Global Arbovirus Initiative. The objectives of these initiatives are to strengthen surveillance, inter-sectoral collaboration, and preparedness for arboviral outbreaks [17]. Public health strategies similarly prioritize early case detection, epidemiological surveillance, laboratory capacity, and risk communication to facilitate timely outbreak response and prevent widespread transmission [21,23].

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Vaccination represents a novel preventive option. The VIMKUNYA vaccine, a virus-like particle vaccine, has been licensed in the United States for individuals aged $\geq$ 12 years, primarily for travelers to outbreak areas, although its availability for broader public health use in endemic settings remains limited [17,20].

4.2.4. The Emerging Therapy of Chikungunya Infection

A review of several primary studies has identified several emerging therapeutic approaches to chikungunya infection. Several studies highlight the importance of multidisciplinary and innovative approaches for managing chronic chikungunya complications. As demonstrated by Cavalcante et al. (2024), anodal transcranial direct current stimulation (tDCS) targeting the primary motor cortex (M1) significantly reduced pain intensity in patients suffering from chronic chikungunya arthritis compared to sham stimulation. No serious adverse effects were reported [7].

For long-term management, Dutra et al. (2024) recommended a multidisciplinary rehabilitation approach, emphasizing extended follow-up beyond one year, integration of physical rehabilitation to improve mobility and prevent disability, and mental health screening due to the high risk of depression among chronically affected patients [3].

Concurrently, Doran et al. (2022) underscored the need for multidisciplinary care for patients exhibiting a high degree of severity, integrating rheumatological management with psychological interventions. The authors further recommended the implementation of routine psychological screening and supportive interventions to address persistent symptoms, including depressive mood, insomnia, and loss of vitality, which can persist despite improvements in physical pain [3].

4.3. Long-Term Outcomes of Chikungunya Infection

Long-term outcomes of Chikungunya infection included health impacts after experiencing chronic symptoms and reports of neutralizing antibody (NAb) titers after symptomatic infection. Most studies have reported that chikungunya can cause persistent musculoskeletal symptoms, including chronic arthralgia, myalgia, and weakness. These symptoms can result in functional impairment, including difficulty walking and performing daily activities, as well as a loss of autonomy [3,10,14]. The presence of chronic pain and disability has been demonstrated to have a substantial impact on quality of life, often resulting in the onset of psychological consequences, including fatigue, insomnia and an elevated risk of depression [3,10].

Neurological complications, although less frequent, can result in long-term disability, particularly in cases of myelitis, encephalitis, or acute disseminated encephalomyelitis. A limited percentage of cases present with concomitant stroke or other neurological deficits. Furthermore, although mortality was rarely documented, it did occur in a small percentage of cases [8].

However, certain cohorts have reported mild disease without chronic sequelae, which highlights the variability in clinical outcomes. Furthermore, the stability of neutralizing antibodies over an extended period may contribute to protection against subsequent infection or the development of chronic complications [6,16].

4.4. Strengths and Limitations

This scoping review comprehensively maps the current evidence on Chikungunya infection, highlighting key research gaps and emerging themes across diverse study designs and adult populations. However, the absence of formal quality appraisal and limited geographic representation may affect the interpretation and generalizability of the findings.

5. Conclusions

Chikungunya infection has an acute and chronic phase. The acute phase lasts 7–14 days and includes high fever, joint and muscle pain, rash, fatigue, and sometimes headaches or gastrointestinal or neurological symptoms. Laboratory findings of the acute phase may include leucopenia and thrombocytopenia. Some patients develop a chronic phase that lasts over three months, marked by

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arthritis, joint pain, and sometimes weakness of the lower extremity. Treatments are symptomatic and supportive, including rest, hydration, and paracetamol for mild cases, and hospitalization and IV fluids for severe cases. Chronic symptoms require specialized care, including NSAIDs, steroids, physiotherapy, neuromodulating drugs, and psychosocial support. Prevention relies on mosquito control, personal protection, public health surveillance, and vaccination for people 12 years of age and older. Rehabilitation and psychological screening are now highlighted as some cases lead to long-term musculoskeletal symptoms and reduce quality of life (QoL), although many recover fully.

6. Future Directions

This scoping review highlights critical gaps in the current literature on Chikungunya. Existing studies have focused on separate aspects of the disease, and the updates are limited and highly heterogeneous. Important aspects, such as the comprehensive recognition of acute Chikungunya disease and its long-term outcomes, particularly in adult populations in tropical, endemic, or epidemic regions, remain poorly investigated.

Future research should prioritize the development of comprehensive algorithms for managing long-term outcomes, given the significant number of long-term cases that affect the quality of life of people with Chikungunya infection, particularly among adults and the elderly, through well-designed longitudinal and multicentre studies. These initiatives are vital to enhancing knowledge, guiding evidence-based clinical practice updates, and supporting the development of contemporary policy.

Supplementary Materials: The following supporting information can be downloaded at the website of this paper posted on Preprints.org: Table S1: Literature Search Strategy for Primary Studies, Spreadsheets S2: Scoping Review_Full Data Extraction.

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Abbreviations

The following abbreviations are used in this manuscript:

PRISMA-Scr	Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews
WHO	World Health Organization
CDC	Centers for Disease Control and Prevention
PAHO	Pan American Health Organization
CHIKV	Chikungunya virus
RT-PCR	Reverse Transcription Polymerase Chain Reaction
QoL	Quality of life
IgM	Immunoglobulin M
IgG	Immunoglobulin G

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CLTCS	Curaçao Long-Term Chikungunya Sequelae
CNS	Central nervous system
PNS	Central nervous system
NAb	Neutralizing antibody

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