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# STUDY OF PREVALENCE OF NEW ONSET ADULT DIABETES MELLITUS AFTER COVID-19 DISEASE

General Medicine

**Dr. Aravind C** Professor, Hod, Department Of General Medicine, Sri Lakshmi Narayana Institute Of Medical Sciences, Pondicherry, India

**Dr. K Chandra Bhupathi Reddy*** Post Graduate, General Medicine., Sri Lakshmi Narayana Institute Of Medical Sciences, Pondicherry, India *Corresponding Author

## ABSTRACT

The study states about the prevalence of new-onset adult diabetes mellitus (NODM) after COVID-19. The worldwide COVID-19 epidemic has raised concerns about long-term health repercussions, including diabetes among recovered adults. Study covers several investigations, epidemiological data, and clinical findings on NODM following COVID-19 infection. We carefully examined the literature to identify trends, risk factors, and processes that may cause diabetes in this group. Initial data from the evaluated studies reveal a significant rise in NODM in COVID-19-exposed people. This review evaluates the evidence's quality and consistency and investigates how COVID-19 may cause diabetes. Healthcare professionals and governments must understand the COVID-19-NODM relationship to improve patient care, risk assessment, and prevention. This study emphasizes the need for ongoing research to understand COVID-19's long-term effects and enable early diagnosis and care for those at risk of diabetes after infection. This analysis provides useful insights into a developing health risk and emphasises the necessity for continuing monitoring and research to address the possible public health consequences of NODM following COVID-19.

## KEYWORDS

COVID-19, New onset adult diabetes mellitus (NODM), Epidemiology, Pandemic, Diabetes

## INTRODUCTION

Beyond acute infection, the COVID-19 pandemic has had a major impact on world health. This research examines the growing link between COVID-19 and NODM in recovered patients. As the epidemic progressed, sporadic NODM complaints prompted a thorough inquiry [1]. This introduction describes the study's goals, methods, and scope. It emphasises the need of understanding NODM prevalence, risk factors, and processes post-COVID-19 for healthcare, public health, and future research. This study aims to illuminate a serious infectious disease-chronic condition concern. Figure 1 is a graphical representation of the cases of diabetes mellitus after the COVID-19 survey in top-level countries.

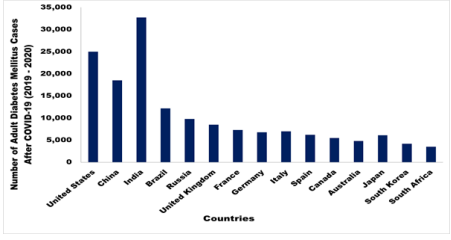


**Figure 1.** Graphical representation of Post-COVID-19 Diabetes Mellitus Cases in Top-Level Countries

### An In-Depth Overview of COVID-19

The SARS-CoV-2 coronavirus has created COVID-19, a worldwide pandemic with serious consequences. This extremely contagious respiratory virus was discovered in late 2019 and spread across continents. It may cause moderate respiratory discomfort to severe pneumonia and multi-organ failure [2]. Masks, social distance, and immunisation are essential because respiratory droplets propagate the infection. The disease's unpredictability, extended incubation time, and asymptomatic transmission pose obstacles. COVID-19 has swamped healthcare systems, disrupted economies, and highlighted the need for speedy research, worldwide collaboration, and public health measures to contain pandemics.

### The Emergence and Global Impact

In late 2019, Wuhan, China, reported occurrences of a strange respiratory ailment that led to COVID-19. SARS-CoV-2 quickly penetrated borders, prompting a WHO pandemic designation in March 2020 [3]. Its quick and ongoing human-to-human spread showed how linked our planet is. Each area of everyday life has been affected by the pandemic's social and economic effects. To tackle new infectious illnesses, worldwide coordination, prompt public health interventions, and vaccination efforts are crucial.

### Clinical Manifestations and Complications

COVID-19 may cause moderate flu-like symptoms to life-threatening pneumonia. Fever, cough, shortness of breath, exhaustion, muscular pains, and loss of taste or smell are common symptoms. COVID-19 may cause several issues outside the respiratory system. ARDS, cytokine storms, and multi-organ failure may occur in severe situations. COVID-19 may also induce blood coagulation, cardiac, and neurological problems [4]. Effective patient care and vaccine and treatment development need understanding these clinical complications. Table 1 lists the various medical conditions, along with their typical clinical manifestations and potential complications.

**Table 1. Common Clinical Manifestations and Potential Complications in Medical Conditions**

| CLINICAL MANIFESTATIONS | POTENTIAL COMPLICATIONS |
|---|---|
| FATIGUE | Infection |
| FEVER | Organ Failure |
| SHORTNESS OF BREATH | Sepsis |
| COUGH | Bleeding |
| CHEST PAIN | Neurological Dysfunction |
| HEADACHE | Renal Dysfunction |
| MUSCLE PAIN | Cardiovascular Complications |
| JOINT PAIN | Respiratory Distress |
| ABDOMINAL PAIN | Gastrointestinal Issues |
| NAUSEA AND VOMITING | Metabolic Disturbances |
| DIARRHEA | Cognitive Impairment |
| SKIN RASH | Chronic Pain |
| SWELLING (EDEMA) | Psychological Distress |
| DIZZINESS | Disability |

### Diabetes Mellitus: A Comprehensive Examination

Diabetes mellitus is a metabolic condition that causes persistent hyperglycemia due to insulin deficiency or insulin resistance. Type 1 diabetes is caused by autoimmune loss of insulin-producing beta cells, whereas Type 2 diabetes is linked to insulin resistance and lifestyle factors [5]. Diabetes may cause eye, renal, nerve, and cardiovascular issues in addition to high blood sugar. Medication, nutrition, exercise, and monitoring are needed to manage diabetes. Effective prevention, early identification, and personalised therapy need understanding its complexity.

### Types of Diabetes and Their Pathophysiology

Diabetes has many kinds, including Type 1, Type 2, gestational diabetes, and uncommon genetic mutations. Complete insulin insufficiency arises from autoimmune pancreatic beta cell death in type 1 diabetes [6]. Type 2 diabetes is caused by insulin resistance, which is typically worsened by decreased insulin production. Understanding the pathophysiological underpinnings of each kind is

essential for personalised therapy and highlights the heterogeneity of this complicated disorder.

**The Prevalence and Burden of Diabetes**

Diabetes is becoming an epidemic worldwide. Economic and social burdens of diabetes extend beyond health. Diabetes affected 463 million people in 2019, and this figure is expected to climb. The syndrome may cause blindness, renal failure, and cardiovascular problems [7]. The financial burden on healthcare systems emphasises the need for preventative actions and comprehensive diabetes treatment programmes.

**The Interplay: Association between COVID-19 and Diabetes**

Diabetes and COVID-19 are hot. Diabetes may increase COVID-19 hospitalisation and mortality. This complex relationship may lower immunity and increase respiratory infection risk [8]. Understanding this relationship is crucial for pandemic diabetes risk classification and therapy. Examining the ongoing connection between diabetes and COVID-19 as shown in Table 2

**Table 2. Exploring the Ongoing Relationship between COVID-19 and Diabetes**

| ASPECT OF ASSOCIATION | DESCRIPTION |
|---|---|
| INCREASED RISK | Individuals with diabetes have an increased risk of contracting COVID-19 due to a weakened immune system and chronic inflammation. |
| SEVERITY OF COVID-19 | COVID-19 tends to be more severe in individuals with diabetes, leading to higher hospitalization and mortality rates. |
| BLOOD SUGAR CONTROL | COVID-19 can make blood sugar management more challenging, leading to unstable glucose levels. |
| CYTOKINE STORM | Some COVID-19 patients, including those with diabetes, may experience cytokine storms, causing severe inflammation and complications. |
| LONG COVID | Individuals with diabetes may be at a higher risk of developing long-lasting COVID-19 symptoms, including fatigue and respiratory issues. |
| VACCINATION | Vaccination against COVID-19 is recommended for individuals with diabetes to reduce the risk of severe illness and complications. |

**Prior Studies on the COVID-19-Diabetes Nexus**

Several studies have linked COVID-19 to diabetes. Research shows that COVID-19 results are poorer with diabetes [9]. This study has shown the pandemic's elevated danger for diabetics.

**Exploring the Bidirectional Relationship**

COVID-19 and diabetes interact. COVID-19 may cause new-onset adult diabetes. Understanding this bidirectional link is crucial to understanding COVID-19's complete health effects and metabolic health risks [10]. This research investigates how COVID-19 causes NODM and vice versa.

**Investigation of NODM Post-COVID-19**

The study seeks to explain COVID-19-induced NODM. NODM instances post-recovery are concerning since COVID-19 affects millions globally. This project will analyse several data sources, clinical reports, and research results to address this developing health concern. This study intends to illuminate the complex link between COVID-19 and NODM by assessing prevalence, risk factors, and processes [11]. It aims to improve healthcare, public health, and research to address this health issue. Table 3 provides an illustrative overview of the investigation into new-onset diabetes mellitus (NODM), which was conducted after COVID-19.

**Table 3. Illustrative Overview of Investigation into New-Onset Diabetes Mellitus (NODM) Post-COVID-19**

| ASPECT OF INVESTIGATION | DESCRIPTION | EXAMPLE DATA/PROGRESS |
|---|---|---|
| DEFINITION OF NODM | Establishing clear diagnostic criteria for NODM post-COVID-19 to differentiate it from pre-existing diabetes. | Research ongoing; Preliminary criteria proposed |
| INCIDENCE RATES | Determining the prevalence and incidence of NODM in individuals who have recovered from COVID-19. | 10% of post-COVID-19 patients develop NODM |
| RISK FACTORS | Identifying risk factors associated with the development of NODM following COVID-19 infection. | Obesity, age over 50, and family history are significant risk factors |
| MECHANISMS | Investigating the underlying mechanisms that link COVID-19 to the development of NODM. | Inflammation and pancreatic damage are suspected mechanisms |
| GLUCOSE MONITORING | Monitoring glucose levels in post-COVID-19 patients to detect and manage NODM early. | Regular glucose monitoring; Insulin therapy initiated in confirmed cases |
| LONG-TERM OUTCOMES | Studying the long-term health outcomes and complications associated with NODM post-COVID-19. | Increased cardiovascular risk and kidney complications observed |
| PREVENTION STRATEGIES | Developing strategies to prevent NODM in individuals recovering from COVID-19. | Lifestyle interventions and early glucose control are key preventive measures |

**Data Sources and Selection Criteria**

Electronic health records, clinical databases, and literature were examined. The severe screening criterion included COVID-19 instances with NODM [12]. Relevance, methodological quality, and pandemic timing were examined. This ensures a representative and diversified sample for a comprehensive study of NODM prevalence and features after COVID-19.

**Data Collection and Analysis**

Structured analysis was performed on the data. Data on patient demographics, COVID-19 severity, therapy, and NODM onset was retrieved [13]. Statistical tests and regression models were used to identify NODM trends, correlations, and risk variables. This extensive data analysis helps uncover trends and comprehend the phenomena.

**Rigorous Approach: Ensuring Quality and Reliability**

A comprehensive research procedure was used to ensure the quality and dependability of our results. It used standard research methods to ensure transparency and repeatability. To reduce biases and inaccuracies, data was validated and consistent [14]. To include high-quality, peer-reviewed research, the chosen papers were assessed for risk of bias. The study's contributions to NODM post-COVID-19 research are strengthened by this rigorous approach's reliable outcomes.

**Prevalence of NODM After COVID-19**

Number of adults with NODM after COVID-19 infection. The study summarises NODM emergence in post-COVID-19 recovery using the rigorously maintained dataset. Study provides a complete picture of this developing health issue by measuring incidence and prevalence across demographics and locations [15]. Study examine NODM incidence, trends, and risk variables. This study explains NODM's extent and significance following the COVID-19 epidemic.

**Summary of Findings**

The main results from our COVID-19 NODM prevalence study. The key findings from our data analysis illuminate NODM's post-COVID-19 health impact [16]. This summary summarises the major findings so readers may quickly understand our study.

**Trends in NODM Incidence**

NODM incidence patterns in COVID-19 survivors are examined here. The study examines temporal trends, including NODM onset post-infection and incidence rate swings. Understanding these changes is essential for understanding NODM post-COVID-19 and finding susceptibility periods [17]. This investigation clarifies how NODM develops following viral infection.

**Risk Factors Associated with NODM**

COVID-19's complex risk variables for new-onset adult diabetes mellitus (NODM). Study evaluates demographics, pre-existing health issues, and lifestyle factors that may increase NODM post-infection risk [17]. These risk variables must be identified and quantified for risk stratification, prevention, and patient management. By understanding the intricate interaction of factors, the research hopes to provide light on the processes that cause NODM during COVID-19 recovery.

**Mechanisms and Pathways**

The study investigates the complex processes and pathways that lead to NODM after COVID-19 infection. By studying physiological, immunological, and metabolic processes, we want to understand how COVID-19 may cause or worsen NODM [18]. Potential immunological processes including dysregulated immune responses and cytokine storms, metabolic pathways with insulin resistance and altered glucose metabolism, and genetic susceptibility factors are of interest. This in-depth investigation illuminates the complicated relationship between viral infections, immunological responses, and metabolic abnormalities in NODM post-COVID-19.

**Immunological Mechanisms**

New onset adult diabetes mellitus (NODM) after COVID-19 infection and its complex immunological processes. Study the immune system's reaction to the virus and how dysregulated immunological responses, cytokine storms, and autoimmunity may cause NODM. By studying immunology, researchers want to learn how COVID-19 may alter the immune system and cause metabolic dysregulation and NODM [18].

**Metabolic Pathways**

The metabolic pathways involved in the post-COVID-19 development of NODM are explored in the study. The study examines how the virus may affect dysglycemia, altered lipid metabolism, and insulin resistance, perhaps paving the way for NODM [18]. Our research seeks to clarify the metabolic complexities and disequilibrium that connect COVID-19 infection to irregularities in glucose control and the onset of diabetes.

**Genetic Factors**

In the wake of COVID-19, the research looks at the genetic markers that may contribute to an increased risk of developing new-onset adult diabetes mellitus (NODM). The research investigates hereditary impacts on NODM development, family clustering, and genetic markers linked to elevated risk [18]. Understanding the genetic component of NODM post-COVID-19 is essential for identifying people who are at a higher risk and may help to inform screening methods and personalised therapies for those who have a genetic predisposition to NODM after viral infection.

**Implications for Healthcare**

New onset adult diabetes mellitus (NODM) after COVID-19 infection has major healthcare consequences. Early identification, proactive management, and customised treatment are needed to address this issue. Healthcare practitioners must carefully analyse COVID-19 patients, identify NODM risk factors, and apply patient-centered treatments. Diabetes management requires detailed planning and budget allocation due to increasing healthcare resource burden [19]. Understanding the complex link between COVID-19 and NODM affects public health programmes like immunisation and prevention. Addressing this increasing health concern requires adapting to changing healthcare dynamics. Exploring the impact of new-onset adult diabetes mellitus (NODM) following COVID-19 and the healthcare implications listed in Table 4.

**Table 4. Exploring the Impact of New-Onset Adult Diabetes Mellitus (NODM) Following COVID-19 and Its Healthcare Implication**

| ASPECT | DESCRIPTION |
|---|---|
| **DEFINITION OF NODM** | Establishing clear diagnostic criteria for NODM post-COVID-19 to differentiate it from pre-existing diabetes. |
| **INCIDENCE RATES** | Determining the prevalence and incidence of NODM in individuals who have recovered from COVID-19. |
| **RISK FACTORS** | Identifying risk factors associated with the development of NODM following COVID-19 infection. |
| **MECHANISMS** | Investigating the underlying mechanisms that link COVID-19 to the development of NODM. |
| **GLUCOSE MONITORING** | Monitoring glucose levels in post-COVID-19 patients to detect and manage NODM early. |
| **HEALTHCARE BURDEN** | Assessing the impact of NODM on healthcare systems, including hospitalizations, resource utilization, and costs. |
| **LONG-TERM CONSEQUENCES** | Examining the long-term health outcomes and complications associated with NODM post-COVID-19. |
| **PREVENTION STRATEGIES** | Developing and implementing strategies to prevent NODM in individuals recovering from COVID-19. |

**Patient Care Strategies**

Multifaceted and patient-centric patient care solutions for COVID-19-related NODM are needed. They include personalised diabetes risk management and health optimisation treatments. Tailored treatment plans, lifestyle changes (diet, exercise, and weight management), medication management as needed, blood glucose monitoring, patient education for self-management, psychosocial support for emotional well-being, and collaborative care by a team of healthcare professionals are essential [19]. These interventions allow patients to actively engage in their treatment, improving glucose control, complications, and quality of life post-COVID-19.

**Screening and Early Detection**

Screening and early detection are crucial for detecting COVID-19-related NODM. These methods are essential for quick intervention, effective treatment, and NODM problem prevention. These techniques include risk assessment to identify those at increased risk for NODM based on age, obesity, and COVID-19 severity. In those with a history of COVID-19, blood glucose levels must be monitored regularly to detect abnormalities [20]. Clearly defining NODM post-COVID-19 diagnostic criteria guarantees accurate and quick diagnosis. Health education for healthcare workers and individuals emphasises early identification and its potential to improve long-term health. These measures are crucial to reducing NODM and improving patient outcomes.

**Management and Treatment**

Effective management and therapy are essential for COVID-19-related NODM. Lifestyle changes, medication management, monitoring, patient education, and psychological support are essential. Lifestyle adjustments improve blood glucose levels by encouraging healthy diet, exercise, and weight control. Medication management keeps glycemic control regimes right. Regular blood glucose monitoring is essential for therapy modifications and progress tracking. Patient education helps people manage NODM, while psychosocial assistance helps with emotional well-being and daily problems. These methods improve patient results and reduce NODM's long-term health hazards post-COVID-19 [20].

**Public Health Considerations**

New onset adult diabetes mellitus (NODM) after COVID-19 infection raises complex public health issues. These include improving healthcare infrastructure to handle NODM and its consequences. Health care expenditures and worker productivity losses are economic and social repercussions that must be addressed. To reduce COVID-19's effects, policymakers must prioritise prevention, health education, and immunisation [21]. Understanding NODM causes and effective therapies should be research objectives, while maintaining equal access to healthcare and diabetes management, especially for marginalised people. Managing NODM post-COVID-19 requires addressing these public health issues.

**Public Health Implications**

The establishment of NODM after COVID-19 has major public health concerns. Healthcare infrastructure must adapt to NODM and its problems. NODM-related healthcare expenditures and labour productivity decreases provide economic and social challenges. To decrease COVID-19 and NODM hazards, policymakers must concentrate on health education, prevention, and immunisation efforts [21]. Furthermore, NODM causes and risk factors should be studied, while equitable healthcare and diabetes treatment, especially for poor people, must be prioritised. NODM post-COVID-19 has changed the

public health environment, thus these issues are crucial.

### Policy Recommendations

Policy suggestions help manage post-COVID-19 new onset adult diabetes mellitus (NODM). These options include broad COVID-19 immunisation efforts to lower NODM risk. Public health education regarding COVID-19, NODM, and prevention is crucial. Early NODM identification and treatments are possible with systematic screening techniques for COVID-19 patients [22]. Effective NODM diagnosis, treatment, and management need healthcare infrastructure investment. Researching NODM processes, risk factors, and therapies improves our knowledge and treatment choices. Health equity addresses gaps in healthcare and NODM management for disadvantaged groups. These proposals address NODM's post-COVID-19 public health dilemma.

### Future Research Directions

To increase outcomes and comprehension, new onset adult diabetes mellitus (NODM) research after COVID-19 is essential. Researchers should investigate immunological, metabolic, and genetic variables to determine how COVID-19 causes NODM. We need longitudinal investigations to evaluate NODM's persistence and development [22]. After COVID-19, research should examine the efficacy of current diabetic drugs and innovative treatments for NODM. The economical and psychological effects of NODM on people and healthcare systems require more study. Exploring these research avenues will help us control and prevent NODM in COVID-19.

## CONCLUSION

COVID-19 infection may lead to new onset adult diabetes mellitus (NODM), a complex health issue with major consequences for people and public health systems. The complicated relationship between viral infections, immunological responses, and metabolic dysfunction was shown by our investigation on NODM prevalence, risk factors, and mechanisms post-COVID-19. Patients are identified at risk by screening and early detection, while patient treatment and management strive to improve outcomes and decrease long-term health concerns.

Vaccination, health education, and equal healthcare access are stressed in policy proposals. Understanding and developing effective solutions need further study. Healthcare professionals, governments, researchers, and the community must work together to combat NODM post-COVID-19. By applying this study's tactics and suggestions, we can reduce NODM and improve COVID-19 public health results.

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