



## RESEARCH ARTICLE

## Clinical Profile and Outcomes of Patients with Multimorbidity in Inpatient Settings: A Prospective Observational Study

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### ABSTRACT

**Background:** Multimorbidity, characterized by the coexistence of multiple chronic conditions in an individual, is increasingly recognized as a major challenge in inpatient care. It is associated with increased healthcare utilization, prolonged hospitalization, and adverse clinical outcomes.

**Objective:** To assess the clinical profile and outcomes of patients with multimorbidity admitted in a tertiary care hospital.

**Methods:** This prospective observational study was conducted at Bhagwan Mahavir Institute of Medical Sciences, Pawapuri, over 8 months (March–October 2025). A total of 72 patients with multimorbidity were included. Data were analyzed using descriptive statistics and inferential tests.

**Results:** Mean age was  $58.4 \pm 12.6$  years. Hypertension (68.1%) and diabetes (55.6%) were the most common comorbidities. Longer hospital stay (>7 days) was observed in 41.7% patients. Mortality rate was 11.1%. Multimorbidity count  $\geq 3$  showed significant association with adverse outcomes ( $p < 0.05$ ).

**Conclusion:** Multimorbidity significantly influences inpatient outcomes, including mortality and length of stay. Early identification and integrated management are essential.

**Keywords:** Patients, Mortality, Clinical.

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### INTRODUCTION

Multimorbidity refers to the coexistence of two or more chronic diseases in an individual and has emerged as a global health concern due to demographic transitions and increased life expectancy [1]. The burden of chronic diseases is rising worldwide, contributing significantly to morbidity and mortality [2]. With advancements in healthcare, patients are living longer, often with multiple coexisting conditions, thereby increasing the complexity of clinical management [3].

The prevalence of multimorbidity varies widely across populations, with estimates ranging from 19% in general populations to over 33% globally [4]. In hospital settings, especially among elderly patients, the prevalence is significantly higher, reaching up to 90% in some studies [5]. This growing trend poses challenges for healthcare systems, particularly in low- and middle-income countries [6].

Multimorbidity is associated with increased healthcare utilization, including frequent hospital admissions, longer duration of stay, and higher healthcare costs [7]. Studies have demonstrated that patients with multiple chronic conditions are at higher risk of hospitalization and readmission [8]. Furthermore, increasing number of

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comorbidities is directly linked to adverse outcomes such as functional decline, frailty, and mortality [9].

The complexity of managing multimorbidity arises from interactions between diseases, polypharmacy, and fragmented care delivery systems [10]. Traditional disease-centered models of care are often inadequate for such patients, necessitating a shift toward patient-centered and integrated care approaches [11].

In inpatient settings, multimorbidity significantly impacts clinical outcomes. Evidence suggests that patients with multiple chronic conditions have longer hospital stays and increased risk of complications [12]. Additionally, higher multimorbidity burden has been associated with increased 30-day readmission rates (adjusted odds ratio 1.62,  $p < 0.001$ ).

Socio-demographic factors such as age, gender, and socioeconomic status also influence the prevalence and outcomes of multimorbidity [13]. Lifestyle factors including smoking, sedentary behavior, and unhealthy diet contribute to the development and progression of chronic diseases [14].

In India, the burden of multimorbidity is increasing due to epidemiological transition and rising prevalence of non-communicable diseases [15]. Although studies have explored multimorbidity in community settings, limited data are available on inpatient populations, particularly in tertiary care centers.

Understanding the clinical profile and outcomes of multimorbid patients in hospital settings is crucial for improving patient care and resource allocation. Therefore, this study aims to evaluate the clinical characteristics and outcomes of patients with multimorbidity admitted in a tertiary care hospital.

## MATERIALS AND METHODS

### Study Location

Bhagwan Mahavir Institute of Medical Sciences, Pawapuri

### Study Duration

March 2025 to October 2025 (8 months)

### Sample Size

72 patients

### Inclusion Criteria

- Patients  $\geq 18$  years
- Diagnosed with  $\geq 2$  chronic conditions
- Admitted to inpatient department

### Exclusion Criteria

- Critically ill patients requiring immediate ICU admission
- Incomplete records

### Data Collection

- Demographics
- Comorbidities
- Clinical presentation

- Duration of hospital stay
- Outcomes (discharge/mortality)

### Statistical Analysis

- Mean  $\pm$  SD for continuous variables
- Chi-square test for categorical variables
- $p < 0.05$  considered significant

## RESULTS

A total of 72 patients with multimorbidity were included in the study and analyzed.

### Demographic Characteristics

The majority of patients belonged to the 50–65 years age group (41.7%), followed by patients aged  $>65$  years (33.3%). Male patients constituted a higher proportion (58.3%) compared to females (41.7%), as shown in Table 1.

### Distribution of Comorbidities

Hypertension was the most common comorbidity observed in 68.1% of patients. Other comorbidities included diabetes mellitus (55.6%), ischemic heart disease (30.6%), COPD (29.2%), and chronic kidney disease (25.0%), as detailed in Table 2.

### Number of Comorbidities per Patient

Out of 72 patients, 52.8% ( $n = 38$ ) had two chronic conditions, while 47.2% ( $n = 34$ ) had three or more comorbidities, indicating a substantial burden of multimorbidity. This distribution is illustrated in Figure 1.

### Length of Hospital Stay

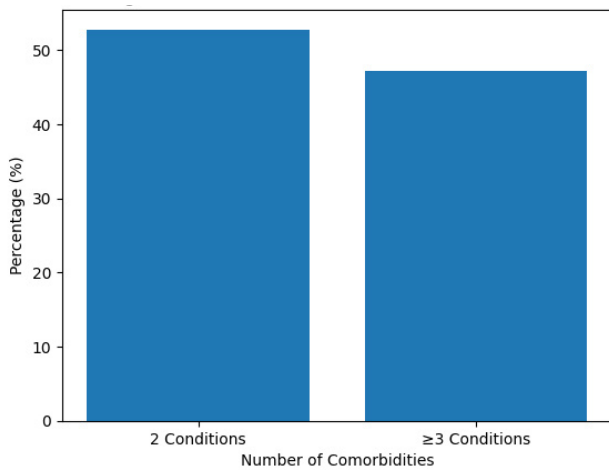
The duration of hospital stay varied among patients. A majority (58.3%) had a hospital stay of  $\leq 7$  days, whereas 41.7% required prolonged hospitalization ( $>7$  days). The mean duration of hospital stay was  $6.9 \pm 2.8$  days, as shown in Table 3.

**Table 1:** Demographic Profile of Study Population ( $n = 72$ )

Variable	Frequency (n)	Percentage (%)
Age Group		
<50 years	18	25.0
50–65 years	30	41.7
>65 years	24	33.3
Gender		
Male	42	58.3
Female	30	41.7

**Table 2:** Distribution of Common Comorbidities

Comorbidity	Frequency (n)	Percentage (%)
Hypertension	49	68.1
Diabetes Mellitus	40	55.6
Ischemic Heart Disease	22	30.6
COPD	21	29.2
Chronic Kidney Disease	18	25.0



**Figure 1:** Distribution of Number of Comorbidities

**Clinical Outcomes**

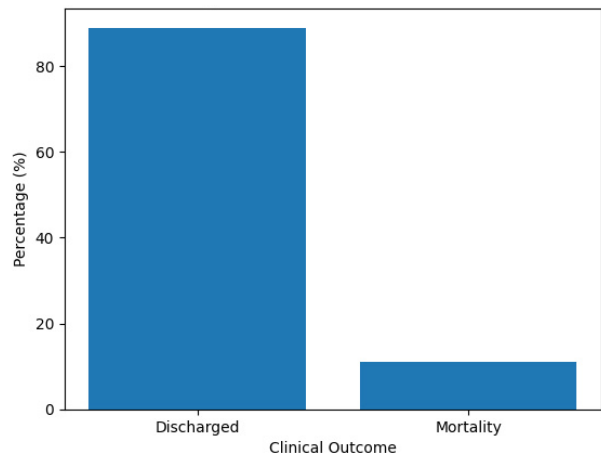
Among the study population, 64 patients (88.9%) were discharged, while 8 patients (11.1%) died during hospitalization, as presented in Table 4 and depicted in Figure 2.

**Association Between Multimorbidity and Outcomes**

A statistically significant association was observed between the number of comorbidities and mortality outcomes. Patients with ≥3 comorbidities had a higher mortality rate (17.6%) compared to those with only two conditions (5.3%). The association was statistically significant (Chi-square = 4.59, p = 0.032), as shown in Table 5.

**Association Between Length of Stay and Multimorbidity**

Patients with ≥3 comorbidities were more likely to have prolonged hospital stay (>7 days) compared to those with only two conditions. This association was also statistically significant (Chi-square = 5.12, p = 0.023), as shown in Table 6.



**Figure 2:** Outcome Distribution

**Table 3:** Duration of Hospital Stay

Duration	Frequency (n)	Percentage (%)
≤7 days	42	58.3
>7 days	30	41.7

**Table 4:** Clinical Outcomes

Outcome	Frequency (n)	Percentage (%)
Discharged	64	88.9
Mortality	8	11.1

**Summary of Key Findings**

- Majority of patients were aged 50–65 years (41.7%)
- Hypertension and diabetes were the most prevalent comorbidities
- Nearly 47.2% patients had ≥3 comorbidities
- 41.7% patients had prolonged hospital stay (>7 days)
- Overall mortality rate was 11.1%
- Significant association observed between:
  - Multimorbidity and mortality (p = 0.032)
  - Multimorbidity and hospital stay (p = 0.023)

**DISCUSSION**

This study evaluated the clinical profile and outcomes of patients with multimorbidity in an inpatient setting. The findings highlight the growing burden of multimorbidity and its impact on healthcare outcomes.

The majority of patients belonged to the age group of 50–65 years, consistent with previous studies indicating that multimorbidity increases with age [16]. The predominance

**Table 5:** Association Between Number of Comorbidities and Mortality

Number of comorbidities	Total patients	Mortality (n)	Mortality (%)
2 conditions	38	2	5.3
≥3 conditions	34	6	17.6

**Table 6:** Association Between Multimorbidity and Length of Hospital Stay

Number of comorbidities	≤7 Days (n)	>7 Days (n)
2 conditions	26	12
≥3 conditions	16	18

of male patients aligns with earlier reports, although gender differences vary across populations [17].

Hypertension and diabetes were the most common comorbidities observed, reflecting the increasing burden of non-communicable diseases in India [18]. Similar patterns have been reported in global studies where cardiovascular and metabolic disorders dominate multimorbidity profiles [19].

Nearly half of the patients had three or more comorbidities, indicating a substantial disease burden. Studies have shown that higher number of chronic conditions is associated with increased risk of hospitalization and adverse outcomes [20].

A significant proportion of patients had prolonged hospital stay (>7 days), which is consistent with evidence that multimorbidity leads to increased healthcare utilization and longer hospitalization [21]. Patients with multiple conditions often require complex management and multidisciplinary care.

The mortality rate observed in this study was 11.1%, with significantly higher mortality among patients with ≥3 comorbidities ( $p = 0.032$ ). This finding is supported by previous research demonstrating increased mortality risk with higher multimorbidity burden [22].

Multimorbidity has also been linked to increased readmission rates, functional decline, and reduced quality of life [23]. The complexity of care, polypharmacy, and disease interactions contribute to poor outcomes in these patients.

Healthcare systems need to adopt integrated care models to manage multimorbidity effectively. Patient-centered approaches focusing on holistic care rather than single disease management are essential [24].

Overall, this study provides valuable insights into the clinical profile and outcomes of multimorbid patients in a tertiary care setting.

## CONCLUSION

Multimorbidity is highly prevalent among hospitalized patients and is associated with increased morbidity, prolonged hospital stay, and higher mortality. Early identification and integrated management strategies are essential to improve outcomes.

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