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# Prevalence and Risk Factors of Gastroesophageal Reflux Disease among Adults Attending a Tertiary Care Hospital in South India: A Prospective Observational Study

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**Abstract:** ***Gastroesophageal reflux disease (GERD) is a chronic gastrointestinal disorder caused by the retrograde movement of gastric contents into the esophagus, leading to symptoms such as heartburn and regurgitation. The prevalence of GERD has increased globally due to changes in lifestyle, dietary patterns, obesity, and associated comorbidities. GERD significantly affects quality of life and may lead to complications if left untreated. The present study aimed to assess the prevalence, severity, and associated risk factors of GERD among patients attending the gastroenterology department of a tertiary care hospital. A prospective observational study was conducted over a period of six months among 150 adult patients diagnosed with GERD. Data were collected using a structured data collection form and the Enhanced Asian Rome III Diagnostic Questionnaire (EAR3Q). Demographic variables, body mass index (BMI), lifestyle habits, dietary factors, comorbidities, and severity of symptoms were evaluated. Statistical analysis was performed using IBM SPSS version 28, and a p value <0.05 was considered statistically significant. Among the 150 patients, males constituted 51.3% and females 48.7%. The majority of patients belonged to the age group of 51–60 years. Based on symptom severity, 57.3% of patients had Grade I GERD symptoms, 34% had Grade II symptoms, and 8.7% had Grade III symptoms. Obesity, smoking, alcohol consumption, caffeine intake, and dietary habits were found to be significantly associated with GERD.GERD is highly prevalent among middle-aged adults and is strongly associated with modifiable lifestyle and dietary risk factors. Early identification, patient education, and lifestyle modification play a crucial role in reducing disease severity and preventing complications.***

**Keywords:** Gastroesophageal reflux disease, EAR3Q, prevalence, risk factors, lifestyle.

## 1. Introduction

Gastroesophageal reflux disease (GERD) is a chronic and relapsing gastrointestinal disorder characterized by the reflux of gastric contents into the esophagus, resulting in troublesome symptoms and/or complications. It is one of the most commonly encountered conditions in gastroenterology practice and represents a significant healthcare burden worldwide.

The pathophysiology of GERD is multifactorial and involves an imbalance between aggressive factors such as gastric acid, pepsin, bile salts, and pancreatic enzymes, and the defensive mechanisms of the esophageal mucosa. Key mechanisms include transient relaxation of the lower esophageal sphincter (LES), reduced LES pressure, impaired esophageal clearance, delayed gastric emptying, and increased intra-abdominal pressure. Certain foods and medications are known to reduce LES tone, thereby promoting reflux.

Globally, the pooled prevalence of GERD is estimated to be approximately 14%, with higher prevalence reported in Western countries. In India, studies have reported prevalence rates ranging from 8% to 30%, reflecting differences in lifestyle, dietary habits, urbanization, socioeconomic status, and diagnostic criteria used. Urban populations tend to have a higher prevalence compared to rural populations, likely due to increased consumption of fast food, sedentary lifestyle, obesity, and stress.

GERD significantly affects health-related quality of life by causing sleep disturbances, reduced work productivity, and psychological stress. Chronic untreated GERD may lead to complications such as erosive esophagitis, esophageal strictures, Barrett's esophagus, and esophageal adenocarcinoma. Considering the rising prevalence and long-term complications, understanding the risk factors and severity patterns of GERD is essential for early diagnosis and effective management.

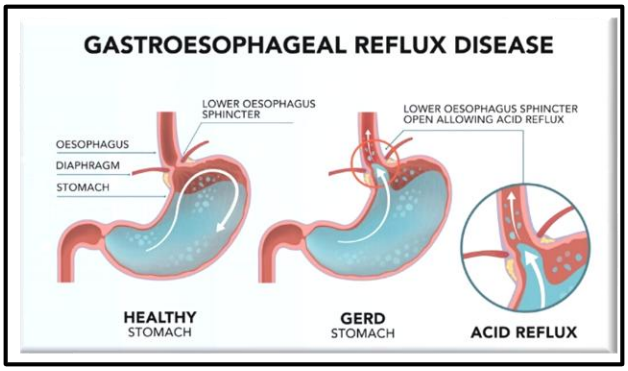


**Figure 1:** Gastro Oesophageal Reflux Disease

## 2. Materials and Methods

### 2.1 Study Design and Setting

A prospective observational study was conducted in the gastroenterology department of a tertiary care hospital located in Thiruvananthapuram, Kerala, India.

### 2.2 Study Duration

The study was carried out over a period of six months from April 2023 to September 2023.

### 2.3 Sample Size

A total of 150 patients diagnosed with GERD were enrolled in the study. The sample size was calculated based on a reported prevalence of GERD of 10.7%, with a 95% confidence interval and a 5% margin of error.

### 2.4 Inclusion Criteria

- Patients aged 18 years and above
- Patients diagnosed with GERD
- Patients willing to participate and provide informed consent

### 2.5 Exclusion Criteria

- Pediatric patients
- Pregnant and lactating women
- Patients unwilling to participate in the study

### 2.6 Data Collection Procedure

Data were collected using a structured data collection form that included demographic details (age, gender, occupation), anthropometric measurements (height, weight, BMI), lifestyle factors (smoking, alcohol consumption, caffeine intake, tobacco chewing), dietary habits, comorbidities, and laboratory parameters. GERD symptoms and their severity were assessed using the Enhanced Asian Rome III Diagnostic Questionnaire (EAR3Q), which is a validated tool for diagnosing GERD in Asian populations.

### 2.7 Statistical Analysis

Data were entered into Microsoft Excel and analyzed using IBM SPSS version 28. Descriptive statistics were expressed as frequencies and percentages. Associations between GERD and risk factors were analyzed, and a $p$ value $<0.05$ was considered statistically significant.

## 3. Results

### 3.1 Age Distribution

The age-wise distribution of patients revealed that the majority belonged to the 51–60-year age group, indicating an increased prevalence of GERD with advancing age. This may be attributed to age-related physiological changes, increased comorbidities, and prolonged exposure to risk factors.

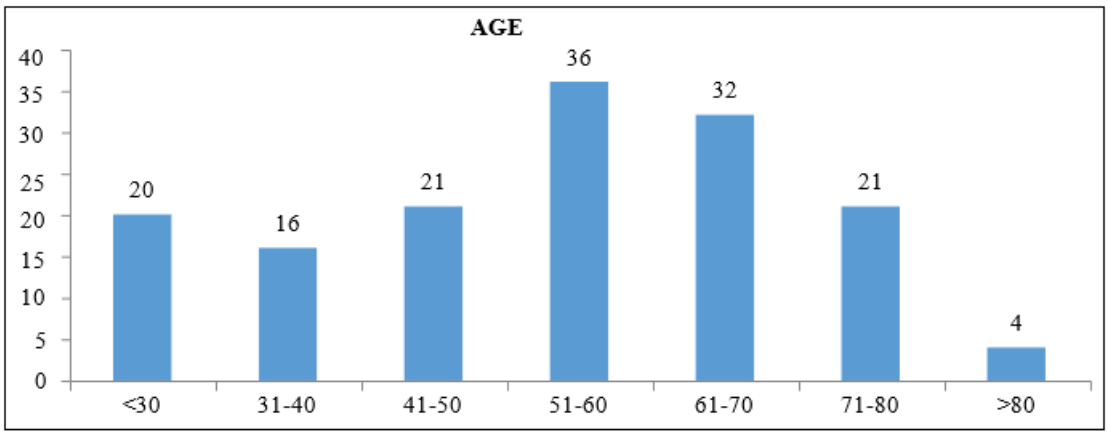


**Figure 2:** Percentage of age distribution

### 3.2 Gender Distribution

Among the study population, 51.3% were males and 48.7% were females. The slight male predominance observed may be due to higher exposure to lifestyle-related risk factors such as smoking and alcohol consumption.

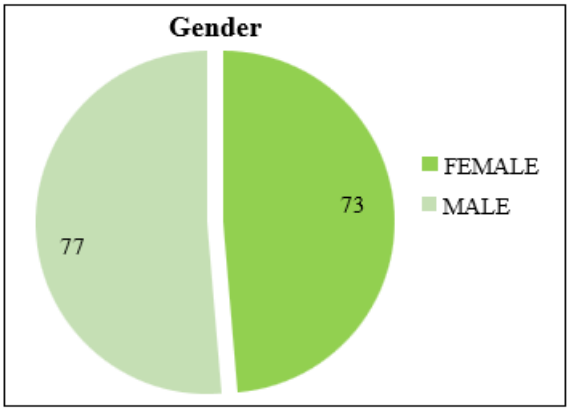


**Figure 3:** Percentage of gender distribution

### 3.3 Body Mass Index (BMI)

BMI analysis showed that a significant proportion of patients were overweight or obese. Obesity is a well-established risk factor for GERD due to increased intra-abdominal pressure, which promotes reflux of gastric contents into the esophagus.

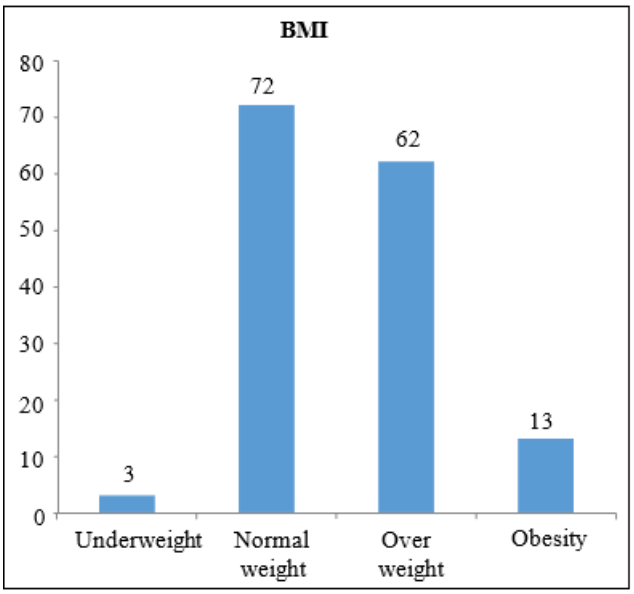


**Figure 4:** Percentage distribution based on body mass index (BMI)

### 3.4 Severity of GERD Symptoms

Based on EAR3Q grading, 57.3% of patients had Grade I symptoms, characterized by mild and intermittent heartburn or regurgitation. Grade II symptoms were observed in 34% of patients, while 8.7% had Grade III symptoms, indicating severe and frequent reflux symptoms that significantly impaired daily activities.

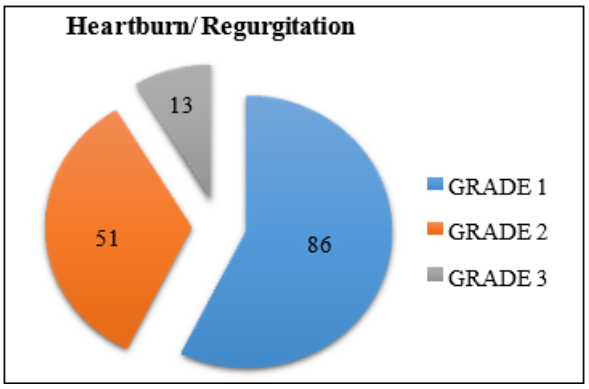


**Figure 5:** Severity grading of GERD symptoms among the study population

### 3.5 Lifestyle and Dietary Risk Factors

Lifestyle factors such as smoking, alcohol consumption, caffeine intake, and dietary habits including frequent consumption of spicy and fatty foods were significantly associated with GERD symptoms. These factors are known to reduce LES pressure and irritate the esophageal mucosa, thereby worsening reflux symptoms.

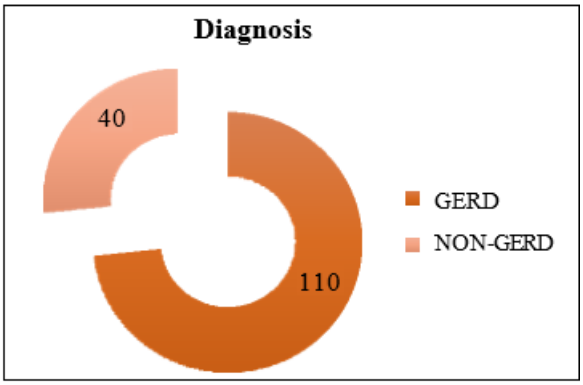


**Figure 6:** Distribution of lifestyle and dietary risk factors associated with GERD

### 3.6 Associated Comorbidities

The most commonly observed comorbidities among GERD patients were diabetes mellitus, hypertension, and dyslipidemia. The presence of these conditions may contribute to GERD through altered gastrointestinal motility and increased medication use.

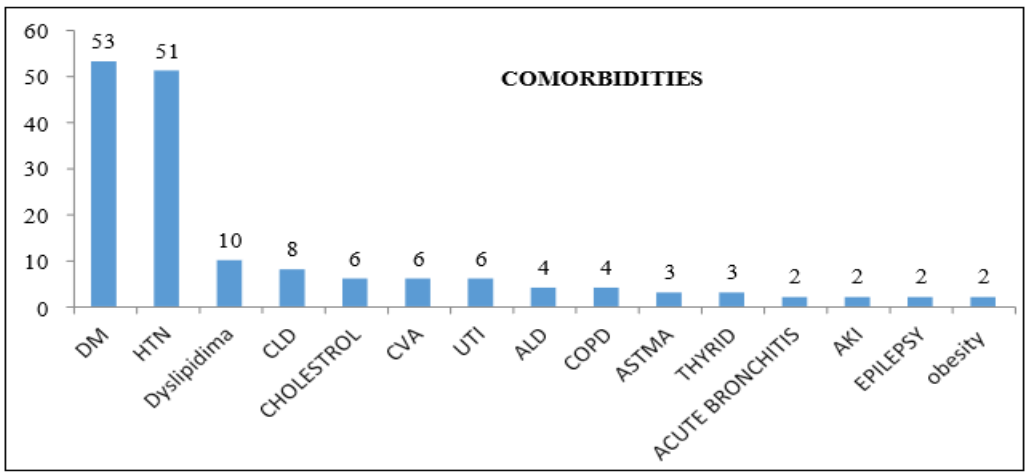


**Figure 7:** Percentage distribution of associated comorbidities

## 4. Discussion

The present study demonstrates a high prevalence of GERD among middle-aged adults, consistent with findings from previous Indian and international studies. The increased prevalence observed in the 51–60-year age group highlights the role of age-related physiological changes and cumulative exposure to risk factors.

Male predominance observed in this study aligns with reports suggesting higher GERD prevalence among males, although some studies have reported conflicting results. Obesity emerged as a significant risk factor, supporting existing evidence that increased intra-abdominal pressure contributes to LES dysfunction and reflux.

Lifestyle habits such as smoking and alcohol consumption were strongly associated with GERD symptoms. Smoking reduces LES pressure and impairs salivary bicarbonate secretion, while alcohol increases gastric acid secretion and delays gastric emptying. Caffeine and spicy foods further aggravate reflux symptoms by irritating the esophageal mucosa.

The use of EAR3Q allowed effective assessment of symptom severity and identification of risk factors. Patient counseling and lifestyle modification were observed to improve symptom control, emphasizing the role of clinical pharmacists in patient education and disease management.

## 5. Conclusion

Gastroesophageal reflux disease is a highly prevalent chronic gastrointestinal disorder with multifactorial etiology. Lifestyle factors, dietary habits, obesity, and comorbid conditions play a significant role in disease severity. Early diagnosis, patient education, and lifestyle modification are essential to reduce disease burden and prevent long-term complications. Clinical pharmacists can contribute significantly to GERD management through patient counseling and therapeutic optimization.

## 6. Limitation of Study

The effectiveness of therapy should be analyzed by using Endoscopy, Esophageal pH monitoring, Esophageal motility study, Esophagogastroduodenoscopy, Gastric emptying test, Laparoscopy, Laryngoscopy, Acid perfusion test, High resolution monography. But during the study period, only Endoscopy was obtained and other parameters were sufficiently available. Hence, we used endoscopy and other parameters for evaluating the effectiveness of therapy. The period of study was 6 months, which limited the accuracy and sensitivity of our study.

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