

LIFESTYLE AND CLINICAL FACTORS ASSOCIATED WITH GASTROESOPHAGEAL REFLUX DISEASE (GERD): A LITERATURE REVIEW BASED ON CROSS-SECTIONAL STUDY

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ABSTRACT

Gastroesophageal Reflux Disease (GERD) is one of the most common gastrointestinal disorders and its prevalence continues to increase in many populations. Various lifestyle habits and clinical conditions are believed to contribute to the occurrence of GERD. This literature wants to summarize evidence regarding lifestyle and clinical factors associated with GERS based on findings from cross sectional studies. The review was based on the analysis of several published cross sectional studies from different countries and populations. Information related to study characteristics, participant demographics, lifestyle habits, and clinical variables associated with GERD was collected and analyzed. The results show that several lifestyle factors such as smoking, unhealthy dietary patterns, coffee or soft drink consumption, night eating habits, low physical activity, and insufficient sleep are frequently associated with a higher risk of GERD. In addition, clinical and demographic factors including older age, female sex, obesity, use of analgesic or NSAID medications, and certain psychological conditions were also reported to be related to GERD occurrence. These findings suggest that both lifestyle behaviors and clinical factors play an important role in the development of GERD.

Keywords: Clinical Factors; Cross-Sectional Studies; Gastroesophageal Reflux Disease; Lifestyle Factors; Literature Review.

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INTRODUCTION

Gastroesophageal Reflux Disease (GERD) has emerged as a significant global health concern, characterized by the reflux of stomach contents into the esophagus, leading to troublesome symptoms such as heartburn and regurgitation. The prevalence of GERD varies considerably across different geographic regions and populations, ranging from 10.99% to as high as 44.8%.

The pathophysiology of the disease is driven by a complex interplay of demographic factors, such as age over 50 and female gender, alongside lifestyle behaviors. Despite the extensive documentation of these

risk factors, a notable research gap remains regarding how consistently these determinants affect people in different walks of life and the conflicting evidence surrounding the roles of BMI and socio-economic status.

This study seeks to bridge this gap by centering on the human element of the disease, moving beyond clinical data to understand the lived reality of those affected. This review systematically evaluates the extent to which diverse demographic backgrounds and specific daily lifestyle exposures shape the risk of developing GERD and ultimately dictate the quality of

life for individuals across various global communities.

MATERIALS AND METHODS

a. Materials

The materials used in this study were scientific articles discussing lifestyle and clinical factors associated with Gastroesophageal Reflux Disease (GERD). The articles were obtained from various scientific journals and databases, including Google Scholar, SpringerLink, and other peer-reviewed journal sources.

The selected literature consisted of studies involving different populations, including adults, university students, and adolescents from several countries. The reviewed studies mainly examined factors related to GERD such as demographic characteristics, lifestyle habits, dietary patterns, medication use, and clinical conditions.

b. Method

This study used a literature review approach to summarize findings from previous research regarding lifestyle and clinical factors associated with GERD. The literature selection focused on cross-sectional studies that analyzed the prevalence or risk factors of GERD in different populations. The literature search was conducted using several keywords, including “gastroesophageal reflux disease,” “GERD,” “risk factors,” “lifestyle factors,” and “cross-sectional study.”

The inclusion criteria for the selected articles were: (1) Studies discussing Gastroesophageal Reflux Disease (GERD), (2) Studies analyzing lifestyle or clinical factors related to GERD, (3) Studies using a cross-sectional study design, and (4) Studies conducted in human populations.

Articles that did not focus on GERD risk factors or used different study designs were excluded from the review. Data extracted from each article included the author, study location, sample size, variables studied, and main findings.

The extracted data were then summarized in tabular form to facilitate

comparison between studies. Finally, the results were analyzed descriptively to identify common patterns of lifestyle and clinical factors associated with GERD.

RESULT

A total of 10 studies met the inclusion criteria and were included in this systematic review. The included studies were conducted in several countries, namely Indonesia, Iran, Chile, Ethiopia, Palestine, and Saudi Arabia. Most of the studies used a cross-sectional study design, while one study used a prospective cross-sectional observational approach. The populations involved varied widely, including general community populations, hospital patients, university students, and adolescents, with sample sizes ranging from 90 to 163,018 participants. The characteristics of the included studies are presented in Table 1.

The prevalence of gastroesophageal reflux disease (GERD) varied considerably across the included studies and populations. The highest prevalence was reported in a population-based study conducted in Chile, which found a GERD prevalence of 44.8% among adults. Studies conducted among university students also reported relatively high prevalence rates. For instance, research conducted in Palestine reported a prevalence of 33.4%, while a study among university students in Ethiopia reported a prevalence of 32.1%. In addition, studies conducted in Iran reported GERD prevalence rates of 21.86% and 10.99% among adult populations aged 35–70 years and 35–65 years, respectively. Meanwhile, a community-based study conducted in Indonesia reported a GERD prevalence of 13.3% among adults aged 20 years and above.

Several studies identified demographic factors that were significantly associated with GERD occurrence. Increasing age was consistently reported as an important factor, particularly among individuals aged above 50 years. Female sex was also found to be associated with a higher prevalence of GERD in several studies. However, not all studies reported significant associations

between demographic characteristics and GERD. One study conducted among clinical stage students in Indonesia found no significant relationship between respondent characteristics, including age and sex, and the occurrence of GERD ($p > 0.05$).

Lifestyle and behavioral factors were frequently reported as significant contributors to GERD occurrence. Several studies found that smoking, unhealthy dietary patterns, consumption of soft drinks, and coffee intake were associated with an increased risk of GERD. A study conducted among adolescents in Bandar Lampung demonstrated a significant association between coffee consumption and GERD incidence ($p = 0.002$), indicating that mild to moderate coffee consumption may increase the risk of GERD symptoms. Furthermore, a study conducted among university students in Palestine identified night eating syndrome and low physical activity as significant lifestyle factors associated with GERD.

Clinical conditions and medication use were also reported as important factors associated with GERD. Several studies identified obesity and the use of non-steroidal anti-inflammatory drugs (NSAIDs) as potential risk factors for GERD. Additionally, poor oral hygiene, short sleep duration, and frequent consumption of fried foods were reported as contributing factors in one large population-based study conducted in Iran.

One study conducted among GERD patients in Indonesia examined the relationship between GERD symptoms and quality of life. The study found a significant correlation between GERD diagnosis assessed using the GERD-Q questionnaire and quality of life measured using the GERD-HRQL instrument ($p = 0.005$). Patients with higher GERD-Q scores were found to have poorer quality of life.

Overall, the findings from the included studies indicate that the prevalence of GERD varies widely across populations and geographical regions. Several factors were consistently associated with GERD

occurrence, including increasing age, female sex, smoking, unhealthy diet, obesity, coffee consumption, night eating syndrome, and low physical activity. In addition, GERD symptoms were shown to have a negative impact on patients' quality of life.

The reviewed studies consistently demonstrate that GERD is a multifactorial condition influenced by lifestyle, dietary habits, psychosocial stress, and pharmacological factors. However, critical comparison reveals variations in findings across populations. For instance, Abed et al. (2024) and Belete et al. (2023) emphasized behavioral determinants such as night eating and irregular meal timing among university students, whereas Sadafi et al. (2024) and Sadeghi et al. (2024) highlighted metabolic and demographic factors such as obesity and smoking in general populations. This divergence suggests that age group and social context may shape the relative importance of risk factors, underscoring the need for population-specific preventive strategies. Dietary influences also show heterogeneity. Kanzulli et al. (2024) identified coffee consumption as a significant trigger among adolescents, while Hapsari et al. (2017) reported GERD prevalence in rural communities linked to broader dietary and environmental patterns. These findings indicate that while caffeine is a well-established dietary risk factor, cultural and regional dietary practices may modulate GERD risk differently.

Table 1. Systematic Review Result

Author	Year	Country	Study Design	Participants	Sample Size	Variables	Main Findings
Manterola et al.	2020	Chile	Cross-sectional population-based study	Adults ≥ 18 years in Temuco	n = 1,069	GERD prevalence and demographic factors	GERD prevalence was 44.8% and significantly associated with age and female sex.
Tandarto et al.	2020	Indonesia	Cross-sectional study	GERD patients in Atma Jaya Hospital	n = 92	GERD diagnosis (GERD-Q) and quality of life (GERD-HRQL)	Significant correlation between GERD diagnosis and quality of life (p = 0.005). Higher GERD-Q scores were associated with poorer quality of life.
Hapsari et al.	2017	Indonesia	Prospective cross-sectional observational study	Adults ≥ 20 years in Kebon Bawang, Jakarta	n = 90	Demographic factors and lifestyle habits	GERD prevalence was 13.3%. Significant risk factors included age > 50 years, handwashing habits before eating, and consumption of untreated water.
Sadeghi et al.	2024	Iran	Cross-sectional analysis	Adults aged 35–70 years	n = 163,018	Demographic, lifestyle, and clinical factors	GERD prevalence was 21.86%. Risk factors included female sex, age > 50 years, smoking, opium use, fried food consumption, short sleep duration, NSAID use, and poor oral hygiene.
Sadafi et al.	2024	Iran	Cross-sectional population-based study	Adults aged 35–65 years in Ravansar	n = 9,631	Lifestyle and obesity	GERD prevalence was 10.99% and was higher among older adults and women.
Belete et al.	2023	Ethiopia	Cross-sectional institutional-based study	University students in Amhara region	n = 846	Demographic factors and medication use	GERD prevalence was 32.1%. Risk factors included female sex, analgesic use, soft drink consumption, and rural residence.
Maharani et al.	2024	Indonesia	Analytical observational cross-sectional study	Clinical stage students	n = 170	Respondent characteristics and GERD	No significant relationship between respondent characteristics and GERD incidence (p > 0.05).
Kanzulli et al.	2024	Indonesia	Cross-sectional study	Senior high school students in Bandar Lampung	n = 293	Coffee consumption and GERD	Significant association between coffee consumption and GERD incidence (p = 0.002).

Abed et al.	2024	Palestine	Cross-sectional study	University students	n = 1,026	Night eating syndrome and lifestyle	GERD prevalence was 33.4%. Night eating syndrome and low physical activity increased GERD risk.
AlHussaini et al.	2023	Saudi Arabia	Cross-sectional study	University health center visitors	n = 490	Lifestyle factors, BMI, smoking	GERD prevalence was high and associated with unhealthy diet, obesity, and smoking habits.

Note: Most of the included studies used a cross-sectional design and involved different populations including community residents, university students, hospital patients, and adolescents.

DISCUSSION

Similarly, Maharani et al. (2024) introduced pandemic-related lifestyle changes as novel contributors, highlighting the dynamic nature of GERD risk factors in response to global events.

From a clinical perspective, Ghamar-Shooshtari et al. (2023) demonstrated that polypharmacy is common among GERD patients, raising concerns about drug interactions and adverse effects. This finding has significant implications for rational pharmacotherapy and supports the biopsychosocial model, which integrates biological treatment patterns with psychosocial and behavioral determinants. Tandar to et al. (2020) further emphasized the impact of GERD on quality of life, reinforcing the importance of early diagnosis and comprehensive management strategies that address both physical and psychological well-being.

Despite these valuable insights, several limitations are evident across the studies. Most investigations employed cross-sectional designs, limiting causal inference between risk factors and GERD outcomes. Sample sizes were often restricted to specific populations (e.g., university students, rural communities), reducing generalizability.

Self-reported symptoms were commonly used, which may introduce recall bias and underestimation of asymptomatic cases. Furthermore, few studies incorporated objective diagnostic measures such as endoscopy or pH monitoring, which are necessary to validate symptom-based prevalence estimates.

The research gap lies in the need for longitudinal, multicenter studies that integrate both subjective and objective diagnostic tools to establish causal pathways and temporal relationships. Comparative studies across different cultural and dietary contexts would also clarify the role of environmental factors. Additionally, limited attention has been given to the interaction between psychosocial stressors and pharmacological management, suggesting an opportunity for future research to explore integrated treatment approaches that combine lifestyle modification, psychological support, and rational drug use.

CONCLUSION

GERD is a multifactorial disease influenced by lifestyle (e.g., smoking, poor diet, low physical activity) and clinical factors (e.g., obesity, age, medication use), although their impact varies across populations and contexts. However, most evidence is limited by cross-sectional designs, self-reported data, and lack of objective diagnostics, restricting causal interpretation. Future research should adopt longitudinal, multicenter approaches with standardized measurements, while management should integrate lifestyle, clinical, and psychosocial strategies.

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