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## Management of Gastroesophageal Reflux Disease (GERD) by Primary Care Providers in Mississippi

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**Management of Gastroesophageal Reflux Disease (GERD)**

**by Primary Care Providers in Mississippi**

By

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A Project

Submitted in Partial Fulfillment of the Requirements for the

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Graduate Committee Approval

The Graduate Committee of  
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## **DEDICATION**

The team members would like to recognize our family and friends and extend our most heartfelt gratitude to them for their love, patience, and sacrifices they have shown during this year. The completion of this research project signifies the end of a rewarding journey and the beginning of a new endeavor. There are no words to express how thankful we are to our friends, families, and classmates for holding our hands while we conquered this task. We pray we show the Lord's compassion and grace to every peer and patient we encounter, thereby reflecting the knowledge and skills we have obtained at Mississippi University for Women.

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## ABSTRACT

Gastroesophageal reflux disease (GERD) is one of the most common diseases seen in primary care practice. To reduce the negative effects, such as esophageal narrowing, erosions, and precancerous lesions, from uncontrolled or inadequately managed GERD, primary care providers must stay up to date on evidence-based research and integrate the most current guidelines. The American College of Gastroenterology (ACG) updated guidelines for proper management of GERD in 2021, into practice. The guidelines recommend lifestyle modifications, proper pharmacological treatment with proton pump inhibitors (PPIs) for an eight-week course, and proper follow-up and/or referral if unimproved.

The purpose of this research study was to conduct chart reviews of documentation to identify if primary care providers followed current ACG guidelines. After contacting the Mississippi University for Women's Institutional Review Board and receiving permission to conduct chart reviews at four primary care clinics in Southeastern Mississippi, the current researchers collected data from 465 patients' charts to assess if current guidelines were being followed by Mississippi primary care providers. The quantitative retrospective study revealed the majority of primary care providers managed GERD adequately, according to current ACG guidelines. Although the data collection initially included all primary care providers, such as nurse practitioners, medical doctors, doctors of osteopathic medicine, and physicians' assistants, only nurse practitioners and medical doctors were included in the study due to the specific clinics utilized for data collection. Overall, the study revealed nurse practitioners as more compliant than medical doctors with adhering to current ACG guidelines for management of GERD.

If Mississippi primary care providers manage GERD according to the ACG guidelines, better patient outcomes can be achieved. By recommending lifestyle modifications, such as weight loss, elevation of the head of bed, refraining from eating two to three hours prior to bedtime, and avoiding trigger foods, reduction of the negative effects of GERD can be piloted. Correct pharmacological treatment with an eight-week course of PPIs can also reduce the negative outcomes produced by GERD without overtreatment that can lead to other issues, like osteoporosis. If failure of combined therapies occur, referral to a specialist should be made for further treatment. The findings also reiterate the importance of timely follow-up. By following the guidelines, primary care providers can improve patient outcomes through reducing the physical strains of GERD and the economical strains of improper management and treatment of the prevalent disease.

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## **Management of Gastroesophageal Reflux Disease (GERD) by Primary Care Providers in Mississippi**

### **Chapter I: Introduction to the Problem**

Gastroesophageal reflux disease (GERD) has reached a prevalence of 10-20% of the United States population (Tabrez et al., 2018). Now known as a widespread condition amongst the adult population, GERD continues to affect up to 30 million individuals in the United States. Sixty percent of the adult population will experience GERD symptoms over the course of a 12-month period, with 20-30% of those individuals experiencing weekly symptoms (Tabrez et al., 2018). Gastroesophageal reflux disease is associated with five to seven times increased likelihood of developing esophageal adenocarcinoma (Groulx et al., 2020). To avoid the serious complications related to GERD, management techniques must be initiated in a timely manner (Katz et al., 2021).

#### **Problem Statement**

Gastroesophageal reflux disease is one of the most common gastrointestinal diseases seen by primary care providers (Katz et al., 2021). The condition is defined as symptoms of heartburn two or more times per week, or when the esophagus becomes damaged, which causes narrowing, erosions, or pre-cancerous lesions. Gastroesophageal reflux disease is common in the elderly, obese, and pregnant women. Patients may also present with more complex symptoms or atypical symptoms of GERD such as hoarseness, chronic sore throat, adult-onset asthma, globus (a full feeling in the throat), dysphagia, and chronic sinus problems. There can be erosions of a patient's enamel leading to tooth decay or ulcerations of the buccal membranes. Gastroesophageal reflux disease can

present in a variety of ways and should be reviewed carefully with patients. Patients also may not attribute atypical symptoms, as outlined above, as GERD, which can prolong seeking treatment and management. In addition, there is an increase of time off work, a decrease in work productivity and physical functioning, and significant nocturnal symptoms that cause impaired sleep in patients with disruptive GERD (Katz et al., 2021).

The American College of Gastroenterology (2021) is a national organization with a primary focus on advancing gastroenterology and improving patient care. This organization was established in 1932 and has become the foremost respected organization for up-to-date research, publications, and guidelines in the field of gastroenterology (American College of Gastroenterology [ACG], 2021). The American College of Gastroenterology (ACG) vision is to prevent, diagnose, and treat digestive disorders as well as provide premier holistic care. The mission statement of the organization focuses on enhancing providers' ability to deliver the best care possible to patients with gastrointestinal issues and continuing to advance the profession through scientific research, advocacy, and best practices (ACG, 2021).

The ACG released updated management and treatment guidelines for GERD in November 2021 (See Appendix A). For the purpose of this study, the researchers focused on the recommendations of lifestyle modifications with elimination of trigger foods, an eight-week course of proton-pump inhibitors (PPIs), and referral for evaluation of non-responders to PPI therapy. For patients with classic GERD symptoms of heartburn and regurgitation, without alarm symptoms, ACG strongly recommends an eight-week trial of empiric PPI once daily before a meal to aid in diagnosis of GERD (Katz et al., 2021). For the management of GERD, ACG conditionally recommends lifestyle modification with

elimination of trigger foods. Primary care providers must abide by the evidence-based recommendations to prevent complications associated with GERD. Inefficient treatment and follow up of GERD can result in hospital admissions and unnecessary tests (Vaezi et al., 2020). Untreated GERD can lead to further problems, like esophagitis, that can eventually cause bleeding, ulcers, and chronic scarring, all of which lead to permanent damage of the esophagus. Additionally, untreated GERD can lead to Barrett's Esophagus and cancer due to chronic exposure of stomach acid to the esophagus (Vaezi et al., 2020).

### **Statement of Purpose**

The purpose of this study was to determine if primary care providers in Mississippi are managing GERD according to the current guidelines developed by the American College of Gastroenterology.

### **Significance of Study**

This study was useful to primary care providers by determining if Mississippi primary care providers are managing gastroesophageal reflux disease according to the guidelines released by the ACG. This study also brought awareness to the most current guidelines available for the diagnosis, treatment, and management of GERD. Gastroesophageal reflux disease is the most diagnosed digestive disorder in the United States with a prevalence of 20%, resulting in a significant economic burden in direct and indirect costs and adversely affects the patients' quality of life (Tabrez et al., 2018). Therefore, effective management is key for such a prevalent disease process. Effective management of GERD includes encouraging the patient on lifestyle modifications such as weight loss, avoidance of trigger foods, avoidance of

eating immediately before laying down, and elevation of the head of the bed along with PPI usage. This study provided knowledge of GERD diagnosis, treatment, and follow-up in the primary care clinical setting. This research study examined the providers' documentation of patient education, management of GERD, and follow-up according to ACG guidelines.

### **Conceptual Framework**

Pender's Health Promotion Model (HPM) was the theoretical framework utilized for this study. Pender's HPM was useful because the model can assist the primary care provider in developing interventions and understanding health behaviors. Pender believed patients and primary care providers are more likely to participate in a behavior if there is an obvious benefit (Alligood, 2018). Pender believe health promotion could extend longevity, improve quality of life, and decrease the financial burden related to health care costs (Pender & Pender, 1980). Pender's HPM can be defined as health as a positive dynamic state, not simply the absence of disease. Health promotion is directed at improving a patient's level of well-being. The model focuses on the following three areas: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes (Alligood, 2018).

For this study, the concept of managing GERD and detailing treatment options was examined. According to the most recent guidelines, management of GERD can be achieved by recommending lifestyle modifications, such as: monitoring weight loss, avoiding trigger foods, avoid eating several hours before laying down, and elevating the head of the bed (Katz et al., 2021). These measures are all health promoting behaviors. The recommendations reduce the effects of GERD and may also have a

positive impact by promoting overall health of the patient and preventing complications of GERD.

### **Research Questions**

- For patients with a diagnosis of GERD, do primary care providers document education on lifestyle modifications according to the ACG guidelines?
- Do primary care providers prescribe PPIs for management of patients with a diagnosis of GERD according to the ACG guidelines?
- Do primary care providers recommend follow-up visits to monitor symptoms, and refer to gastroenterology as indicated by the ACG guidelines for GERD?

### **Definition of Terms**

For this study, the researchers theoretically and operationally defined the following terms: patients, gastroesophageal reflux disease (GERD), primary care provider, education, lifestyle modifications, guidelines, proton pump inhibitor (PPI), management, follow-up visits, and gastroenterology.

#### ***Patients***

**Theoretical Definition.** An individual who is sick with, or being treated for, an illness or injury; an individual who is receiving medical care (Venes, 2021h).

**Operational Definition.** For the purpose of this study, a patient is defined as an individual seeking medical care from a primary care provider for the treatment of GERD.

### *Gastroesophageal Reflux Disease*

**Theoretical Definition.** A common condition in which acid from the stomach flows back into the esophagus, causing discomfort, and in some instances, damage to the esophageal lining (Venes, 2021d).

**Operational Definition.** For the purpose of this study, GERD is defined as a common problem, also known as acid reflux, with symptoms of heartburn.

### *Primary Care Provider*

**Theoretical Definition.** A professional who gives health care services, or an institution that supervises the rendering of such services, to provide and assume responsibility for the patient's comprehensive care (Venes, 2021i).

**Operational Definition.** For the purpose of this study, a primary care provider is defined as the individual (nurse practitioner, physicians' assistant, physician) who assesses, diagnoses, and treats patients, specifically with a diagnosis of GERD.

### *Education*

**Theoretical Definition.** Demonstrating, instructing, leading, or teaching clients, families, patients, or students (Venes, 2021a).

**Operational Definition.** For the purpose of this study, education is defined as providing adequate information on GERD and a treatment plan specific to a particular patient's needs.

### *Lifestyle Modification*

**Theoretical Definition.** The act or result of changing something about a person's pattern of living and behavior (Venes, 2021f).

**Operational Definition.** For the purpose of this study, lifestyle modifications are

defined as weight loss recommendations, head of bed elevation, tobacco and alcohol cessation, avoiding late-night meals, and elimination of drinks and foods that trigger reflux symptoms, such as caffeine, coffee, chocolate, spicy foods, and highly acidic foods as stated in the ACG guidelines (Katz et al., 2021).

### ***Guidelines***

**Theoretical Definition.** An instructional guide or reference to indicate a course of action in a specified situation (Venes, 2021e).

**Operational Definition.** For the purpose of this study, guidelines refer to a specific set of recommendations released by the American College of Gastroenterology in 2021 that indicate appropriate lifestyle modifications, medications, and further steps for management of patients with a diagnosis of GERD.

### ***Proton Pump Inhibitor***

**Theoretical Definition.** A class of medication that eliminates acid production in the stomach by irreversibly blocking the hydrogen/potassium adenosine triphosphate enzyme system, more commonly known as the gastric proton pump. The drugs are used to treat peptic ulcers, gastroesophageal reflux disease, infection with *Helicobacter pylori*, and related disorders (Venes, 2021j).

**Operational Definition.** For the purpose of this study, a PPI is a class of medication routinely prescribed by a primary care provider for a patient diagnosed with GERD.

### ***Management***

**Theoretical Definition.** The application of professional skill, support, and concern to provide health benefits to a person or community (Venes, 2021g).

**Operational Definition.** For the purpose of this study, management is defined as documenting lifestyle modifications, prescribing PPI therapy, and referring to gastroenterology when indicated.

### ***Follow-up Visits***

**Theoretical Definition.** The continued care or monitoring of a patient after the initial visit or examination (Venes, 2021b).

**Operational Definition.** For the purpose of this study, follow-up visits with the patient's primary care provider determine effectiveness of GERD management after eight-weeks of initiating PPI use to discuss future treatment and/or potential referral according to the ACG guidelines.

### ***Gastroenterology***

**Theoretical Definition.** The branch of medical science concerned with the study of the anatomy, physiology, and diseases of the digestive organs and their treatment (Venes, 2021c).

**Operational Definition.** For the purpose of this study, gastroenterology is defined as a branch of medicine including a doctor who specializes in treatment and management of gastrointestinal disorders, specifically GERD.

### **Assumptions**

For the purpose of this study, the assumptions were as follows:

- Primary care providers diagnosis and manage patients with GERD.
- Primary care providers are aware of the American College of Gastroenterology GERD guidelines.
- Primary care providers document lifestyle modifications for the treatment

of GERD.

- Primary care providers prescribe PPIs for the treatment of GERD.
- Primary care providers schedule follow-up appointments for patients diagnosed with GERD.
- Primary care providers refer patients who are unresponsive PPI therapy to gastroenterology.
- Primary care providers will gain awareness to the need for correct management of GERD as recommended by the ACG through this research study.

### **Limitations**

The researchers anticipated the possibility of several limitations. Among those limitations was the allotted time to collect and review patients' charts for the diagnosis, treatment, and management of GERD. Another limitation of the study was the reluctance of patients to seek care due to an increased risk of exposure to Coronavirus disease (COVID). Some patients with post COVID syndrome may also attribute GERD symptoms to the previous diagnosis of COVID, feeling complaints are residual issues and causing reluctance to return to the doctor for a new complaint. Patients may also find atypical symptoms, such as chronic cough, globus, clearing their throat, or dysgeusia, could be post COVID symptoms and would feel seeking treatment is unnecessary.

### **Summary**

Gastroesophageal reflux disease (GERD) is a widespread disease process and has well-known risk factors for Barrett's esophagus, reflux esophagitis, and

esophageal cancer (Groulx et al., 2020). Proper diagnosis and treatment of GERD is crucial in reducing adverse patient outcomes. The American College of Gastroenterology has released updated guidelines to recommend proper treatment options for GERD. The ACG guidelines recommend several management and treatment options for GERD. For the purpose of this study, the researchers focused on the recommendations of lifestyle modifications as first line treatment for GERD, an eight-week course of proton pump inhibitors (PPIs), and a referral evaluation for non-responders to PPIs. Primary care providers must adhere to the management guidelines because of the evidence-based research behind the recommendations made by the ACG.

## **Chapter II: Review of Literature**

Gastroesophageal reflux disease (GERD) is a prevalent diagnosis routinely treated in primary care clinics. If GERD is not appropriately treated or managed, patients can develop reflux esophagitis, Barrett's esophagus, or esophageal cancer (Katz et al., 2021). The purpose of this study was to determine if primary care providers follow the American College of Gastroenterology (ACG) guidelines in management and treatment of GERD. To assess the practice of primary care providers' implementation of the ACG guidelines, current literature was reviewed. Literature, including Pender's Health Promotion Model (HPM), was also reviewed and deemed most applicable as a framework for this study. Chapter II examines the latest literature relating to using the ACG guidelines in managing and treating GERD and articles identifying barriers to implementation of the guidelines in the primary care setting.

### **Literature Related to Conceptual Framework**

The HPM, which was first presented by Pender in 1982, is used worldwide for practice, education, and research (Alligood, 2018). Through ever-evolving research, the HPM has been revised over the years to remain applicable to current practice. The HPM describes the collaboration between the primary care provider and the client while also considering the role of the client's surroundings in personal health promotion. The model promotes analyzing future possibilities and impacts on the utilization of evolving technology on healthcare. Pender identified health promotion as a goal to be achieved in the 21st century and disease prevention a goal of the past (Alligood, 2018).

After obtaining a doctorate degree, Pender recognized a change in perception of defining nursing care goals (Alligood, 2018). Pender believed the goal of nursing care should be defined as striving to achieve the highest level of health possible. Pender applied the theory in a revised HPM to study the physical activity of young people in Taiwan. Health-promoting behaviors are influenced by three major variables including the following: person experiences and beliefs, individual behaviors, and interpersonal experiences and outcomes (Wu & Pender, 2005). The study revealed the outcomes of the three major variables on physical activity, showing that individual characteristics, such as gender and parent education, directly affected physical activity. Next, social support, such as interpersonal influences, had both direct and indirect effects on physical activity. Lastly, the immediate behavioral contingencies were studied by changes observed from beginning to end. (Wu & Pender, 2005).

Walker and Avant's (2021) article discussed the process of promoting healthy aging from the conceptual analysis of Pender's HPM. The descriptive and theoretical study, with a qualitative approach, used elements of Pender's HPM to model a healthy aging promotion process (Walker & Avant, 2021). In the conceptual analysis, seven antecedents, seven attributes, and three consequences of the concept of healthy aging were identified. Antecedents included spiritual support, family support, self-care, higher education, ability to perform activities of daily living, healthy lifestyle, and resilience. Attributes outlined were the absence of cognitive impairment, absence of physical impairment, disease, pain, psychological well-being, self-perceived health, and social engagement. Consequences included autonomy, independence, and quality of life. Walker and Avant's (2021) article laid the groundwork for the current study in

making a connection between the education provided by the primary healthcare provider and patient outcomes.

Phillips et al. (2000) applied Pender's theory to patient's attitudes and variables affecting attitudes toward nurse practitioners. Patients under the care of nurse practitioners reported overall greater compliance and improved patient outcomes due to the nurse practitioner's focus on health promotion activities (Phillips et al., 2000). Patients also scored higher on quality-of-care measures than physician colleagues. Utilizing the HPM cues individuals to partake in health promoting activities modified by the current situation, personal beliefs, and interpersonal factors. Cognitive-perceptual factors, such as the importance of health, perceived control of health, and perceived benefits and barriers of health-promoting behaviors, were the most important influencing aspects. The study consisted of a questionnaire distributed to 238 people from multiple sites in Pennsylvania. Results revealed no substantial differences related to the factors of gender or race; however, high school graduates, younger people, and those of higher socioeconomic status were more inclined to choose a nurse practitioner as a primary care provider (Phillips et al., 2020).

Being identified as healthcare providers who focus on education and empowerment of patients through methods of health-promoting behaviors as outlined in Pender's theory, nurse practitioners have become an essential component in the healthcare team. As nurse practitioners manage GERD, education will play a vital role in the patient care. This idea and focus were significant in the current study by evaluating the need for patient education. The current researchers evaluated the documentation of nurse practitioners' management of GERD and compared the

management to management practices of other disciplines, such as medical doctors, doctors of osteopathic medicine, and physicians' assistants. Evaluation of each primary care provider's diagnosis, treatment, follow-up care, and/or referral provided to patients with GERD was included.

Pender's HPM guided the current research study on the management of gastroesophageal reflux disease by primary care providers, which included aspects of health promotion. The model was useful because the model assisted the primary care provider in both developing interventions and understanding health risk behaviors associated with GERD. Pender's health promotion model defines health as a positive dynamic state and not merely the absence of disease (Alligood, 2018). Pender believed patients and primary care providers are more likely to participate in a behavior if there is a perceived benefit. Moreover, health promotion is directed at improving a patient's level of well-being. The HPM focused on the following three areas: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes (Alligood, 2018). The HPM was the theoretical framework appropriate to achieve proper management of GERD and detailing treatment options by primary care providers.

### **Review of Literature**

A review of literature was conducted by analyzing primary research studies on GERD management according to the American College of Gastroenterology (ACG) guidelines to support the current research. Tosetti et al. (2021) performed a perspective study for the purpose of identifying, in the primary care setting, the incidence of foods capable of triggering GERD symptoms. Nearly a quarter of the

general population in Western countries experience some symptom related to GERD, such as heartburn and regurgitation (Tosetti et al., 2021). There is a rising prevalence of GERD with 20-25% of the general population already reporting the disease. Despite prevalence, diagnosis for individuals experiencing symptoms happen in a more latent stage. The individuals typically contact a general practitioners when symptoms begin to affect activities of daily living, which leads to a later diagnosis of GERD after progression of the disease has altered sleep patterns, food intake, or work habits (Tosetti et al., 2021).

According to the ACG guidelines for the diagnosis and management of gastroesophageal reflux disease, there is a recommendation to eliminate foods that are known to trigger GERD, such as chocolate, alcohol, caffeine, acidic, or spicy foods. Tosetti et al. (2021) built the hypothesis of the research upon the ACG guidelines. Though not stated, the researchers hypothesized the elimination of trigger foods would cause a reduction in the occurrence of GERD symptoms and a subsequent discontinuation of proton pump inhibitors. The purpose of the study was to identify the foods that elicited typical symptoms of GERD, and to verify whether a consequent specific food elimination diet may result in clinical improvement in GERD patients evaluated in the primary care setting (Tosetti et al., 2021).

The researchers identified diet to play a key factor in the precipitation of GERD symptoms (Tosetti et al., 2021). Previous studies have been inconclusive in identifying the correspondence between the ingestion of a particular food and experiencing pathophysiological symptoms. Though previous studies have failed to show a direct relationship, patients have reported increased reflux symptoms with the

ingestion of certain foods, such as citrus, mint, chocolate, and tomato-based products. For this reason, the researchers recommended to reduce intake of such foods to reduce symptomology (Tosetti et al., 2021).

The perspective study was conducted from March to October of 2019 and consisted of 12 general practitioner outpatient clinics (Tosetti et al., 2021). Practitioners were asked to select adult patients with no previous diagnosis of GERD who were presenting for the first time with typical symptoms of GERD. Patients with alarm symptoms, such as chest pain or difficulty swallowing, were excluded from the study. Other patients ruled out from the study were those in therapy with antisecretory drugs for non-GERD reasons, such as gas prevention and upset stomach, or previously submitted to esophagogastroduodenoscopy. Diagnosis of GERD and quantification of symptoms were made with the GERD-Q questionnaire. The GERD-Q questionnaire assessed symptoms occurring in the week prior to assessment and was included in the professional software the general practitioners used. Individuals with a score of eight or higher on the GERD-Q questionnaire were recruited for the study. Recruitment was considered completed after the 100th participant had been selected (Tosetti et al., 2021).

The study was performed as a routine patient evaluation and included components, such as race, age, gender, medical records, ongoing treatments, and body mass index (Tosetti et al., 2021). Practitioners documented every trigger food related to GERD symptoms reported by the patients. Additionally, patients were asked to look at a precompiled list of foods not reported that had been compiled from previous studies as possible trigger foods for GERD. At the end of the first visit, patients were

asked to eliminate all identified trigger foods from the comprehensive list and follow-up in two weeks. During the two week of trigger food elimination, patients were not to use antisecretory drugs. The use of antacids was allowed. During the follow-up visit, the GERD-Q questionnaire was administered again and documented in the database along with a statement on the elimination of GERD triggering foods and the outcome (Tosetti et al., 2021).

The researchers found, out of 100 participants, all patients reported at least one trigger food via self-report or from the precompiled list at baseline (Tosetti et al., 2021). At the two-week follow-up, 1% of patients reported failure to eliminate the identified triggering food, whereas 46% reported elimination of the trigger foods from the diet. The GERD-Q questionnaire re-administered at the two-week follow-up showed 55% of patients had positive symptom relief with only diet modifications. The frequency of heartburn experienced more than one day a week (scoring >1) decreased from 93% to 44%, while the frequency of regurgitation (scoring >1) decreased from 72% to 28% (Tosetti et al., 2021).

Tosetti et al. (2021) asked patients to make diet changes to improve health outcomes. Reduction in trigger foods also induced weight loss among participants. Promotion of healthy behaviors through reduction of trigger foods contributed to the overall reduction of PPI use, decreased GERD symptoms, and promoted weight loss (Tosetti et al., 2021).

Tosetti et al. (2021) contributed to the current study by reiterating the effects of diet modification on GERD. The study laid the foundation for the current study by showing management options when foods identified as causing GERD symptoms are

eliminated from the diet. A nonpharmacological approach can be used with diet modification and no other endoscopy or consultation is required (Tosetti et al., 2021). The study showed a positive correlation between the elimination of trigger foods and improvement of clinical GERD symptoms experienced by patients, further validating the relevance of guideline number three introduced by Katz et al. (2021).

In addition to evaluating primary care providers' education on trigger foods and aggravating factors contributing to GERD, the current research study analyzed primary care providers' documentation of education on lifestyle modifications. Edman et al. (2017) conducted a study to assess the relationships between perceived stress, quality of life (QOL), and self-reported pain ratings in patients with GERD and other gastrointestinal diseases. The researchers monitored factors that contributed to levels of stress, such as pain, sleep quality, and fatigue, to make a correlation of higher incidences with GERD and lower QOL (Edman et al., 2017). The primary hypothesis of the study concluded a decreased QOL increased with gastrointestinal symptoms (Edman et al., 2017).

Edman et al. (2017) conducted the study through the Duke Clinical Research Institute (DCRI) with enrollment of participants between January 5, 2008, through August 16, 2010, to assess the relationships between perceived stress, QOL, and self-reported pain ratings in patients with GERD and other gastrointestinal diseases. There were participants from a larger study who reported a diagnosis of GERD, irritable bowel syndrome (IBS), or irritable bowel disease (IBD) from a clinician and/or medical chart (Edman et al., 2017). The participants included were at least 18 years old and English literate. The demographics analyzed were gender, age, alcohol and

tobacco use, and education level. Through multiple surveys, Perceived Stress Scale (PSS), 12-Item Short Form Health Survey (SF-12v1), 20-item Center for Epidemiologic Studies Depression Scale (CES-D), and four self-report numerical rating scales (NRS), the researchers studied stress perception, QOL, mood, fatigue, quality of sleep, and pain in all participants (Edman et al., 2017).

There were increased perceptions of stress and decreased QOL in the majority of 188 participants with a diagnosis of GERD (Edman et al., 2017). The study revealed the mental and physical components of QOL was 1/2 and 3/4 standard deviation below the normal for the general population. Although many of the factors assessed within the study were subjective, researchers aimed to prove the significance of symptoms on poor QOL. A lower QOL correlated with higher incidences of GERD symptoms and severity (Edman et al., 2017).

The current researchers focused on management of GERD and lifestyle factors that contribute to the severity of the disease. The study proposed evaluation of documentation on lifestyle modification by primary care providers (Edman et al., 2017). Through management of stress and factors that contribute to decreased QOL, the proposed study assessed techniques on reduction of symptomology and severity of GERD initiated by primary care providers (Edman et al., 2017).

Vaezi et al. (2020) found the prevalence GERD is progressively increasing, although proton pump inhibitors (PPIs) maintain the role of first line treatment. Researchers found 30% of patients with GERD experience refractory symptoms despite adhering to the treatment plan of a once daily PPI; 20% of the adult U.S. population reporting weekly symptoms and 7% reporting daily symptoms (Vaezi et

al., 2020). The researchers conducted a trial to evaluate the effectiveness and safety of adding a bile acid sequestrant, known as IW-3718, in combination with the prescribed once daily PPI for treatment in patients with refractory GERD. Due to research proving prolonged exposure to bile acids can lead to increased esophageal mucosal injury, the researchers sought to determine if adding a gastric-retentive formulation of a bile acid sequestrant would help reduce or eliminate the troublesome symptoms (Vaezi et al, 2020).

The study included 280 patients with confirmed cases of GERD who progressed through screening, pretreatment, and treatment stages (Vaezi et al., 2020). The group of patients included men and women 18 years of age or older who experienced reflux symptoms four or more times a week while taking once daily PPIs for at least eight weeks. Participants were randomly divided into groups to receive either a placebo, 500 mg, 1000 mg, or 1500 mg IW-3718. Throughout the study, each participant documented medication use and daily symptoms via the Modified Reflux Symptom Questionnaire Electronic Diary (mRESQ-eD). The mRESQ-eD was utilized during the pretreatment and treatment periods, and participants rated the severity of symptoms. Each patient and the reported symptoms were reevaluated after two weeks, four weeks, and eight weeks (Vaezi et al., 2020).

Upon completion of the study, 29 patients ended treatment early for assorted reasons, and of the remaining, 73% of participants presented with pathologic acid reflux, while 52% presented with erosive esophagitis (Vaezi et al., 2020). Patients treated with 1500 mg IW-3718 exhibited the largest percentage change in heartburn severity score from the beginning of the trial to week eight with a total of 52.9%,

while only 37.1% of patients who received the placebo reported improvement in heartburn symptoms. Regarding the reduction of regurgitation symptoms, all patients reported a reduction; however, 46.3% of patients treated with 1500 mg IW-3718 reported improvements compared to 34.3% of patients treated with the placebo. The researchers discovered maintaining the previously prescribed PPI dosage with adjunct IW-3718 therapy led to a significant improvement of GERD related symptoms (Vaezi et al., 2020).

Based on results from the study, the researchers determined the use of IW-3718 to be a beneficial addition to GERD management and treatment and would also be appropriate for continued development in trials related to symptom relief in patients with refractory GERD (Vaezi et al., 2020). The current research study evaluated if physicians were managing GERD according to ACG guidelines, which include PPI administration and maintenance. The current researchers determined through chart review if the addition of any adjunct pharmacologic or nonpharmacologic treatment was being utilized. If healthcare providers were unaware of the study findings, the current researchers would share this information to increase provider knowledge and result in an increased use of adjunct IW-3718 when applicable.

Additionally, Walsh et al. (2016) conducted a descriptive quality improvement project with the primary purpose of developing a guideline for proton pump inhibitor (PPI) use as well as deprescribing when appropriate. Proton pump inhibitors are utilized for the treatment of GERD; however, long-term PPI use may lead to increased risk of *Clostridium difficile* infection, community acquired pneumonia, fractures, and malabsorption (Walsh et al., 2016). Gastroesophageal reflux disease is

often evaluated and treated solely in primary care clinics unless additional interventions are necessary. A common issue with GERD management in primary care is the lack of knowledge by primary care providers and appropriate interventions in a prompt manner. A result of inappropriate primary care management would be receiving PPI treatment for a longer duration than necessary (Walsh et al., 2016).

Walsh et al. (2016) developed an intervention tool to be utilized for treatment, reassessment, and documentation of GERD in a primary care setting. The first goal was tailored to generating a deprescribing tool utilizing current GERD guidelines (Walsh et al., 2016). The deprescribing tool was merged into a single document and submitted for review by a local gastroenterologist. Identifying baseline PPI dosages assisted in establishing a foundation for GERD management. Implementation of the deprescribing tool was vital to measure the ease of providers prescribing PPIs without adequate treatment follow-up. Primary care providers are pivotal in the implementation of the deprescribing tool solely due to prior patient relationship and health history awareness. Secondly, the next goal focused on reassessment of PPI effectiveness. Measurement of medication effectiveness was conducted via EMR reminder of the deprescribing tool at the time of patient visit. The third goal focused on appropriately documenting the indications and time limitations for PPI use, which implemented a time parameter for administration of PPIs to prevent the loss of therapeutic effectiveness (Walsh et al., 2016). Chart reviews were conducted to review current PPI use to evaluate appropriateness during the current study.

Nurse practitioners, family medicine residents, and staff physicians conducted the study over a timeframe of 10 weeks at Toronto Western Family Health Team

primary care clinics with a total of 14,000 participants (Walsh et al., 2016). The average patient age in the study was 59 years. Patients were first selected via chart review if the patient was 18 years of age and older while actively being treated with a PPI medication for eight weeks. Initially, the provider received a notification reminder of time for reevaluation if the patient still required PPI use. Once initial notification was received by the provider, a PPI deprescribing tool was uploaded to the patient medical record to serve as a second reminder during the patient visit. The deprescribing tool was completed by the provider via a questionnaire with the patient. The questionnaire served as a provider's secondary method of verification of prescribing PPIs. Utilizing the PPI deprescribing tool provided providers with adequate documentation to supplement proof of continued PPI use. Implementing frequent reevaluations of PPI status prevented chronic, inappropriate use (Walsh et al., 2016).

A beneficial outcome of the study was improved documentation PPI use (Walsh et al., 2016). Utilizing the PPI deprescribing tool required a thorough explanation for PPI use. Another favorable outcome of the deprescribing tool was a decrease in the number of patients taking PPI medications without adequate indications for use. An instrumental aspect of achieving success was directly correlated to the medical record reminders to reassess effectiveness at each visit. The most important outcome was performing quarterly medication audits at primary care visits to update home medications appropriately. Primary care providers play a key role in preventing polypharmacy when providing care to patients over an extended span of life (Walsh et al., 2016).

The current research utilized the latest recommendations for GERD management to perform a retrospective chart review in primary care clinics. The research conducted by Walsh et al. (2016) was applicable to the current study due to the implementation of appropriate management of GERD in primary care. The study verified the overuse of PPIs in the population analyzed and reiterated the need for ongoing evaluation and management of GERD (Walsh et al., 2016). The overall goal of performing the research was to evaluate if GERD was managed in the primary care setting according to the ACG guidelines. Additionally, the research reviewed what primary care providers are documenting in management of GERD.

Gastroesophageal reflux disease can present as varying symptoms to primary care providers and one study took time to evaluate one such atypical symptom. Akst et al. (2014) performed a cohort study to understand the everchanging national trends in the diagnosis and management of GERD. Reflux, or GERD, has grown exponentially over the past 25 years (Akst et al., 2014). In 2005, the National Ambulatory Medical Care Survey (NAMCS) reported an increase of ambulatory reflux visits from 3,090,000 per year in 1990 to 1993 to 9,455,000 in 1998 to 2001. Current estimates for adults affected by GERD daily or weekly are 20% (Akst et al., 2014).

As reflux is on the rise, there is also an awareness and increase in laryngopharyngeal reflux (LPR). Laryngopharyngeal reflux occurs when acid refluxes from the stomach into the esophagus with a rise in this regurgitate to the level of the larynx and pharynx (Akst et al., 2014). The delicate tissue of the larynx and pharynx can be easily irritated and inflamed due to the presence of acid

regurgitant material. Many common symptoms, such as hoarseness, globus pharyngitis, cough, and throat clearing, have been linked to LPR. Other more serious conditions, such as reactive airway disease, laryngeal cancer and leukoplakia, sinusitis, and otitis media, have been reported by the American Academy of Otolaryngology-Head and Neck Surgery (AAO-HNSF) as linked to LPR. Treatment for LPR is not recommended by the American Gastroenterological Association (AGA) without the presence of GERD by (Akst et al., 2014).

Akst et al. (2014) identified one major hypothesis with diagnosis and treatment of LPR. The hypothesis was LPR was over diagnosed, which led to unnecessary costs and misdiagnosis of non-reflux conditions presumed LPR. Gastroenterology and otolaryngology communities emphasized the need to critically think about LPR care (Akst et al., 2014). The ACG guidelines further agreed LPR complaints be treated with PPI only for patients with heartburn and that esophagogastroduodenoscopy (EGD) should not be used to diagnose LPR. The recommendation differs from otolaryngologic practice where PPIs are commonly used to treat hoarseness. Patients who do not respond to a PPI are then referred for an endoscopy (Akst et al., 2014).

The National Ambulatory Medical Care Survey (NAMCS) database was queried for visits related to GERD diagnosis and management (Akst et al., 2014). Data was collected using ICD-9 diagnosis codes for reflux esophagitis and GERD. The data used were estimates of annual ambulatory care for the entire US population from years 1998 to 2001 and recalculated years 2002 to 2005 and then again in 2006 to 2009. Results were weighted to provide national estimates of care. The primary outcome of ambulatory visits for GERD was totaled and then categorized by age,

gender, race, and physician specialty. The physician specialties included in the data sets were internal medicine, family and general practice, gastroenterology, otolaryngology, and other. Secondary data was collected to include medications and education, including both over the counter and prescription medication, such as H2 antagonists, PPI, motility agents, and acid neutralizing agents. The same ICD-9 codes were used for all otolaryngology visits and then calculated. The results were then compared to previously reported time periods from 1990 to 2001 to establish a pattern in all visits (Akst et al., 2014).

The data showed the total number of ambulatory reflux visits increased each period with 8,684,000 annual visits from 1998 to 2001 and nearly doubling to 15,750,000 from 2006 to 2009 (Akst et al., 2014). In relation to gender, diagnosis in females grew more quickly, which made up 61.2% of the visits in 2006 to 2009. Visits for patients from both genders greater than 44 years old also increased more quickly than another other age groups. The US population increased from 277,548,000 in 1998 to 2001 to 302,889,000 in 2006 to 2009, which can account for a small percentage of increased ambulatory visits for GERD. The data revealed an increase in visits of 4.2 per 100 persons in 1998 to 2001 to 5.9 per 100 persons in 2002 to 2005 and 6.9 per 100 persons in 2006 to 2009. The analyzed data revealed a reflux diagnosis in 1.9% of the over 17.7 million annual otolaryngology visits in 1998 to 2001, 2.8% of the over 20.1 million visits in 2002 to 2005 and 2.4% of the over 19 million visits in 2006 to 2009. Other notable increases were the use of anti-reflux medications. Total use of reflux medications jumped from 4,930,000 in 1998 to 2001 to 8,372,000 from 2002 to 2005 and then to 11,512,000 from 2006 to 2009.

Counseling rates, defined as diet and nutrition, medication use, and knowledge of GERD/ LPR diagnosis remained low across all regions throughout the years (Akst et al., 2014).

Factors that may account for the obvious increase in reflux visits can be a direct result of the increase in obesity, population aging, changes in lifestyle and diet, and increased rates of *Helicobacter pylori* infection, which has been proven to cause peptic ulcer and gastric cancer (Akst et al., 2014). Obesity's statistical data mirrored all other increases, where in 2007, 66% of adults were overweight or obese, and by 2015, projecting 75% of US adults would be overweight or obese. Census data also projects the US population over 65 years of age will increase from 12.4% in 2000 to 19.6% in 2030 thereby surmising a continued trend of increased ambulatory reflux visits. Overdiagnosis of GERD may be due to inaccurate medical workup and/or errors in coding, with an overuse of ICD-9 codes for GERD and reflux esophagitis skewing the data. Unfortunately, there is not a diagnosis code specific for LPR or a consensus of how to treat LPR. Evaluation of treatment trends revealed a continual increase in prescribing of PPIs with some statistical data revealing use of PPI for LPR as controversial. Some meta-analysis of PPI verses placebo for chronic laryngitis has shown no benefit, while other randomized controlled trails revealed a positive impact of PPI for extra-esophageal symptoms. Accurate diagnosis and treatment of LPR remains difficult. The AAO-HNSF LPR position statement recommends simultaneous esophageal and pharyngeal pH probe for diagnosis; however, to date, pharyngeal and esophageal pH measurement for a correlation of acid reflux and LPR remain poor. No clear gold standard relative to pH testing for LPR has been determined for best

practice in reflux care for LPR (Akst et al., 2014).

The study was significant to the current research due to the increase in the number of patients being diagnosed with GERD. Primary care providers and gastroenterologists are no longer the only providers diagnosing reflux, but other specialties like otolaryngologists and pulmonologists are making the diagnosis as well (Akst et al., 2014). With the increase in diagnosis, an increase in PPI overuse or failure to look for outlying causes of atypical reflux symptoms may occur. Although the current research did not evaluate primary care providers' diagnosis of GERD, management of the condition was evaluated. The study findings provided excellent feedback for primary care providers to manage, treat, and educate patients on GERD.

The following reviewed article correlates with the final question of the current research study. Gawron et al. (2020) investigated endoscopy procedures that are often considered after the original GERD management option is unsuccessful. Proton pump inhibitors account for over 50% of medications prescribed for all gastrointestinal disorders; however, 40% of patients treated with PPIs experience partial or no response in symptoms. Consequently, patients may require further specialized treatment, like surgical or endoscopic management options (Gawron et al., 2020). The study to evaluate the opinions of expert surgical and therapeutic endoscopy perspectives on the treatment of GERD. The researchers sought to determine what a diverse group of experts would do in various patient scenarios (Gawron et al., 2020).

The researchers utilized the RAND Appropriateness method throughout the study conducted over a six-month period, evaluating the expert opinions of eight foregut surgeons and eight therapeutic gastroenterologists (Gawron et al., 2020). A

foregut surgeon is an expert in the surgical treatment of disease of the esophagus, stomach, and upper small intestines, also known as the upper gastrointestinal tract (Medical College of Wisconsin, n.d.). The RAND method has proven stable in previous studies and allows a meticulous approach to revealing areas of agreement and disagreement in clinical care and present knowledge gaps for future generations of evidence (Gawron et al., 2020). With the documented success of past research studies utilizing the method, the experts were asked to rank the appropriateness of certain interventions regarding the patient scenario. The hypothetical scenarios were grouped according to symptom response to PPIs, which included complete responders, non-responders, and partial responders; six medical and surgical interventions were considered (Gawron et al., 2020).

After review of a variety of patient scenarios, anti-reflux surgery with LF and MSA were ranked as appropriate for all complete and partial PPI responder scenarios (Gawron et al., 2020). TIF was ranked as appropriate in all complete and partial PPI responders without a hiatal hernia. Radio-frequency energy delivery was not ranked as appropriate for complete or partial responders and the panel of experts could not reach an agreement on the appropriateness of LF and MSA for non-responders. Regarding the optimization of medical therapy, several experts favored the option stating increasing the dosage of PPIs could potentially help decrease or alleviate symptoms, while others deemed increasing the dose unfavorable due to undesirable side effects of prolonged PPI use (Gawron et al., 2020). The study provided highlights on agreement for invasive therapeutic approaches for GERD, providing evidence for future research and trials to determine effective treatment and care options (Gawron et

al., 2020).

The study served as a solid foundation for the current research because the study explored treatment options if management with PPI therapy was ineffective while also reiterating the importance of accurate use of PPIs (Gawron et al., 2020). The current researchers responded to a recommendation by determining what management interventions primary care providers were initiating in situations of ineffective PPI therapy and whether the interventions included referral to gastroenterology and possible surgical or endoscopic management. The information gathered from the study was provided to healthcare professionals current researchers encountered and aided in additional and/or necessary treatment for individuals with continued GERD.

### **Summary**

The review of literature provided a foundation for current researchers and guidance for insight on management practices and rationales for care provided by primary healthcare providers regarding GERD and associated symptoms. The student researchers utilized Pender's HPM for the theoretical framework to guide research, depict lifestyle modifications, PPI usage, and compliance with medication regimens to decrease effects of clinical manifestation of GERD. In evaluating the guidelines for the management of GERD, each article contributed an aspect of management in accordance with the guidelines that was evaluated by student researchers. Tosetti et al. (2021) evaluated trigger foods and the effect on management of GERD from a pharmacological and non-pharmacological perspective for treatment of GERD. Edman et al. (2017) evaluated GERD's effects on daily living and function, and

clinical significance of symptoms to improve quality of life. Vaezi et al. (2020) evaluated the effectiveness of PPIs in combination with other treatments to prevent GERD. Walsh et al. (2016) evaluated the deprescribing of PPIs and homed in on documentation for providers. Akst et al. (2014) evaluated the misdiagnosis and over treatment with costly procedures for GERD disorders. Gawron et al. (2020) evaluated invasive treatment options for the management of GERD after the progression of the disease and referral made for intervention. Though each article's content varied widely, all provided a solid foundation to depict variation of treatment and progression of symptoms regarding management of GERD among primary healthcare providers.

### **Chapter III: Design and Methodology**

Gastroesophageal reflux disease (GERD) is a prevalent diagnosis routinely treated in primary care clinics. If GERD is not appropriately treated or managed, patients can develop reflux esophagitis, Barrett's esophagus, or esophageal cancer (Katz et al., 2021). The purpose of this study was to determine if primary care providers follow the American College of Gastroenterology guidelines in treatment of GERD. A retrospective chart review was completed in various primary care clinics located in Mississippi. The data collected from each chart was used to determine if primary care providers were implementing into practice the ACG guidelines for GERD treatment. This study evaluated charts of patients over the age of 18 with a diagnosis of GERD, or any other diagnosis listed on the data collection worksheet from 2018 to present. Chapter three further details the design and methodology implementation in data analysis that were used to conduct this study.

#### **Design**

The design of this study was a quantitative, retrospective, chart review performed in various primary care clinics in the state of Mississippi. A convenience sample of patients 18 years of age and older were included. Any person with a diagnosis of GERD, dyspepsia (functional), heartburn, and/or other upper gastrointestinal issues were included in this study. This research design was appropriate to address the research questions of the study and allowed the reviewing of documentation by primary care providers.

**Setting**

The setting of this study took place in various primary care clinics in the state of Mississippi.

**Population of the Sample**

The population of this study was primary care providers in various primary care clinics in the state of Mississippi. Primary care providers frequently manage patients with GERD; therefore, the focus of this study was on the providers' management of GERD according to the ACG guidelines. The population of primary care providers included nurse practitioners, medical doctors, doctors of osteopathic medicine, and physician assistants. The researchers reviewed 465 patient charts from various selected primary care providers' offices in Mississippi utilizing a nonrandomized convenience sample. The goal was to include 100 charts from each office.

**Methods of Data Collection**

After obtaining consent from Mississippi University for Women's Institutional Review Board (See Appendix B) and the appropriate personnel at each primary care clinic, each of the five members of the research team performed a chart review at a specified clinic in Mississippi. A letter of informed consent was sent to participants (See Appendix C). Each chart was reviewed for the primary care provider's management of GERD, such as lifestyle modification recommendations, prescribing of PPI, and follow-up visit or referral to gastroenterology as indicated by the guidelines. The charts were selected by the diagnosis of GERD and utilizing a data collection worksheet to include ICD-10 codes K21 GERD, K30 Dyspepsia, R12 Heartburn, and other for patients 18 years of age and older. Data was collected from the chart reviews and entered in a data

collection worksheet (See Appendix D) with the use of a coded data collection legend (See Appendix E). The data collection worksheet captured the following information: age; gender; ICD-10 code; type of provider; visit type; PPI; H2 receptor blockers and/or other pharmacologic management; and documentation of lifestyle modifications such as weight loss, elevating the head of the bed (HOB), avoid eating two to three hours before bedtime, and avoiding trigger foods. The types of providers included medical doctors, doctors of osteopathic medicine, nurse practitioners, and physicians' assistants. The type of visits included initial, follow-up, chronic, and problem/acute. The initial visit was the first time the patient had a documented diagnosis of GERD in the chart. The follow-up was the second visit with the diagnosis of GERD in the chart. A problem or acute visit was determined if the patient already had a diagnosis of GERD and was coming in with a complaint related to GERD. A chronic visit included any remaining visit that was not classified by the other determinants. Further data collected assessed the following: follow-up, evaluating if therapeutic results were achieved or any additional interventions were needed. Possible additional interventions included increased PPI dosage, changed to a different medication, addition of supplemental pharmacologic therapy, and referral to a specialist or another provider. There was no breach in confidentiality of the charts selected, and patient information was unavailable to students after research was completed.

### **Methods of Data Analysis**

Data collected from the chart reviews was entered on a data collection worksheet utilizing a data collection legend. After the researchers collected the data from chart reviews, the information was compiled in Microsoft Excel. The data was

then sent to a statistician for statistical analysis using *IBM SPSS Statistics Software, version 27*. The findings were reported using numbers and percentages. These findings will be discussed further in Chapter IV.

### **Summary**

Chapter III examined the design, implementation, data collection, and data analysis methods utilized in the study to assess primary care providers' implementation of the ACG guidelines for GERD. The study was a quantitative retrospective chart review of 465 primary care clinic charts with a diagnosis of GERD and any other correlated diagnosis. Data was confidentially and systematically obtained from a convenience sampling of patients' charts. The data was analyzed to determine whether primary care providers in the state of Mississippi were using ACG guidelines to treat and manage GERD. The results of the study were beneficial in determining the need for further education for primary care providers in relation to the ACG guidelines of GERD.

## Chapter IV: Results

Gastroesophageal reflux disease (GERD) has reached a prevalence of 10-20% of the United States population (Tabrez et al., 2018). Now known as a widespread condition amongst the adult population, GERD continues to affect up to 30 million individuals in the United States. Sixty percent of the adult population will experience GERD symptoms over the course of a 12-month period and 20-30% of those individuals will experience weekly symptoms (Tabrez et al., 2018). Gastroesophageal reflux disease is associated with five to seven times increased likelihood of developing esophageal adenocarcinoma (Groulx et al., 2020). To avoid the serious complications related to GERD, management techniques must be initiated in a timely manner (Katz et al., 2021). Gastroesophageal reflux disease is one of the most common gastrointestinal diseases seen by primary care providers. The condition is defined as symptoms of heartburn two or more times a week or when the esophagus becomes damaged, which causes narrowing, erosions, or precancerous lesions. Gastroesophageal reflux can be common in the elderly, obese, and pregnant women (Katz et al., 2021).

The American College of Gastroenterology (ACG) has released updated guidelines to recommend proper treatment for GERD. The ACG guidelines recommend lifestyle modifications with elimination of trigger foods as first line treatment for GERD. The guidelines also recommend an eight-week course of PPIs as therapy of choice for symptom relief. Non-responders to PPI therapy should be referred to a specialist for evaluation. Primary care providers must adhere to evidence-based recommendations to avoid inefficient treatment that results in poor patient outcomes.

The purpose of this study was to evaluate Mississippi primary care providers' management of GERD according to the ACG guidelines. Since GERD is so commonly seen in primary care, the providers should know how to properly manage the condition. Through assessing documentation by various primary care providers, the researchers evaluated how providers were managing GERD in accordance to current ACG guidelines. Chapter IV will include data analysis followed by outcomes of data analysis related to the research questions, including significant findings.

### **Profile of Study Participants**

Data for this study was collected by method of convenience sampling. The retrospective chart review was performed on 465 charts from four primary care clinics in the state of Mississippi. The convenience sampling of charts included patients 18 years of age and older. Persons with an ICD-10 diagnosis code of GERD K21.9, K30, or R12 were included in the convenience sample. The data was manually extracted and recorded into a data collection worksheet with the use of a coded data collection legend. The data collection worksheet captured the following information: age; gender; ICD-10 code; provider type; visit type; PPI; H2 receptor blockers and/or other pharmacological management; and documentation of findings including lifestyle modifications such as weight loss, elevating the head of the bed (HOB), avoid eating two to three hours before bedtime, and avoiding trigger foods. Further data assessed follow-up, evaluating if therapeutic results were achieved or if any additional interventions were needed. If additional follow-up visits were needed or if additional interventions were necessary, chart reviews analyzed if proper referrals were made according to the ACG guidelines.

The data was compiled in Microsoft Excel using a coded system with subsequent analyses using *IBM SPSS Statistics Software, version 27*.

### ***Gender***

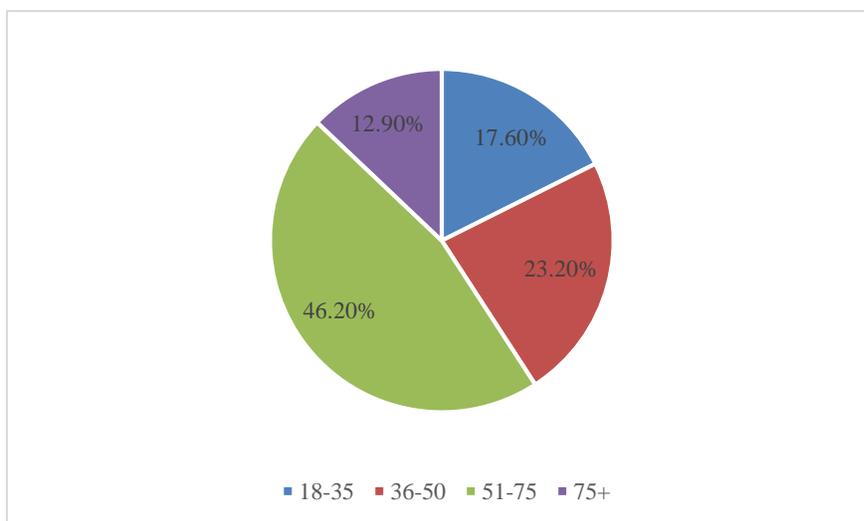
A total of 465 (N= 465) patient charts were reviewed retrospectively. The patients' gender was majority female. Data included 306 (66.0%) female and 159 (34%) male GERD patients.

### ***Age***

For the purpose of this study, only patients over the age of 18 years were included because the ACG guidelines addressed to the adult population. The largest percentage of patients were between 51 and 75 years (46.2%), as shown in Figure 1.

**Figure 1**

*Distribution of Patient Age*



### ***Type of Primary Care Provider***

The two types of primary care providers included in the data collection were physicians and nurse practitioners. Physicians' assistants were included in initial data

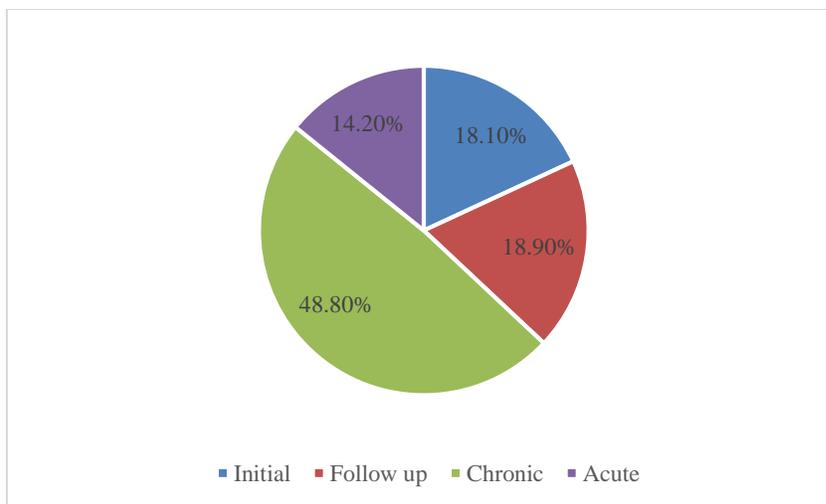
collection; however, the clinics where data were collected did not employ physician assistants.

### **Statistical Outcomes**

The patient charts contained at least one GERD related ICD-10 code, and some charts had more than one related code. The prevalence of codes was 95.3% K21 GERD, 4.1% K30 dyspepsia, 13.5% R12 heartburn, and 9.7% other related diagnoses. Other related diagnoses included dysphagia R13.12 and epigastric pain R10.13. The majority of patients were seen by a nurse practitioner (76.6%), and only 23.0% of patients were seen by a physician. No patients were seen by a physician assistant. The types of visits are exhibited in Figure 2. The most common visit type was a chronic visit (48.8%).

**Figure 2**

*Distribution of Visit Types*



### ***Statistical Outcomes Regarding Research Questions***

The researchers collaborated with a professional statistician to organize the information from the data collection tools into Microsoft Excel spreadsheet. The data was

then analyzed by the statistician using *IBM SPSS Statistical Software, version 27*. The following research questions were investigated:

- For patients with a diagnosis of GERD, do primary care providers document education on lifestyle modifications according to the ACG guidelines?
- Do primary care providers prescribe PPIs for management of patients with a diagnosis of GERD according to the ACG guidelines?
- Do primary care providers recommend follow-up visits to monitor symptoms, and refer to gastroenterology as indicated by the ACG guidelines for GERD?

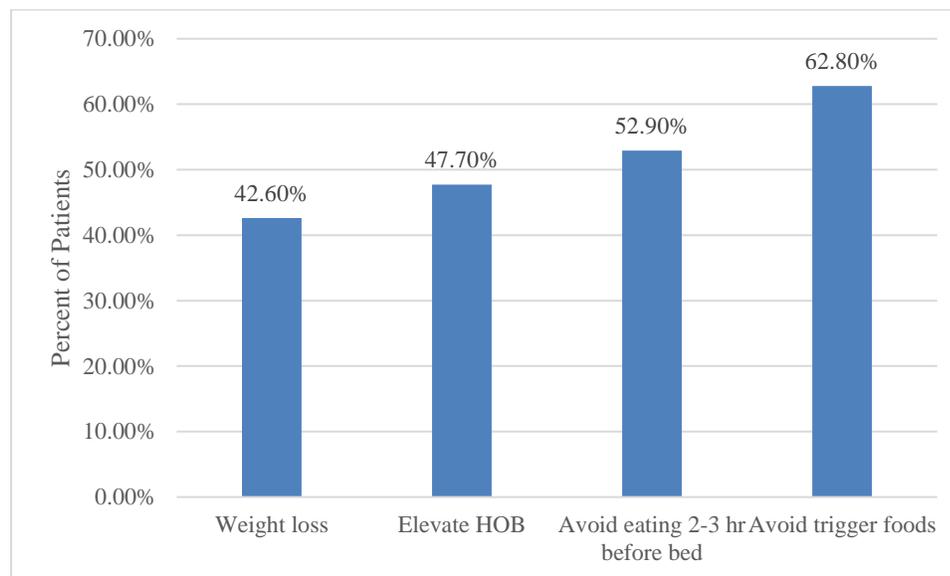
**Research Question 1.** To collect charts of patients diagnosed with GERD, the researchers began the search by dates of January 2018 to present time. The researchers were able to search by the GERD ICD 10 diagnosis codes of K 21.9, K 30, and R12. The researchers categorized the lifestyle modifications documented with each GERD patient into weight loss, elevation of the head of the bed, avoidance of eating two to three hours prior to bed, and avoidance of trigger foods. The prevalence of lifestyle modifications is shown in Figure 3. The most common recommendation was to avoid trigger foods, which was recommended by the primary care provider to 62.80% of the patients.

As shown in Table 1, there were statistically significant differences on prevalence of lifestyle recommendations based on demographics. There were no significant differences based on gender. Regarding age, younger patients were more likely to be recommended weight loss. Nurse practitioners were more likely to recommend all

lifestyle changes, but weight loss was the least recommended lifestyle modification among nurse practitioners

**Figure 3**

*Frequency of Lifestyle Modifications*



**Research Question 2.** In addition to evaluating primary care providers' education on lifestyle modifications, the researchers also evaluated providers prescription usage of PPIs as management for the diagnosis of GERD according to the ACG guidelines. When considering only the charts noting an initial visit (n=84), 84.5% (n=71) noted PPIs being prescribed. Of 465 charts, 69% reported desired therapeutic effectiveness of PPI achieved with no change in treatment. Nine percent required an increase in PPI dosage to achieve therapeutic effects. There were no statistically significant differences in prescription prevalence based on demographics, as configured in Table 2.

**Table 1***Chi-Square Analysis of Lifestyle Recommendations by Demographic Groupings*

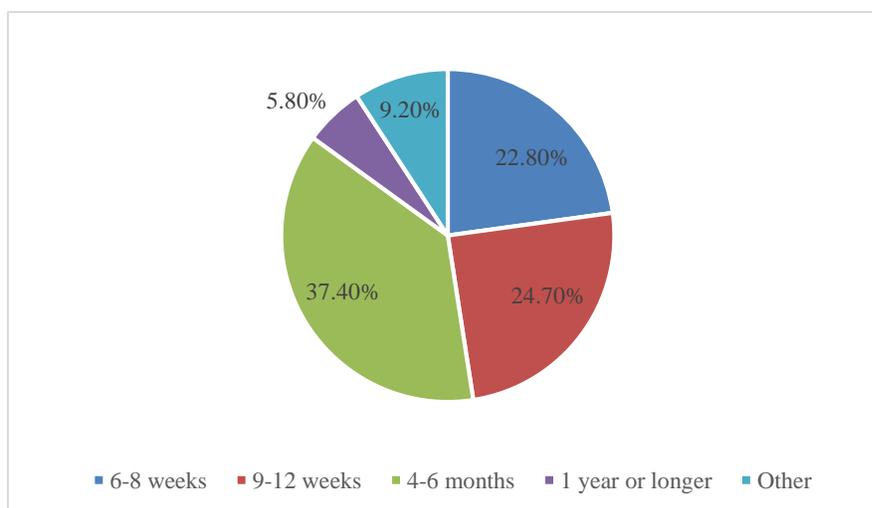
	<b>Weight loss</b>	<b>Elevate HOB</b>	<b>Avoid eating 2-3 hr before bed</b>	<b>Avoid trigger foods</b>
<b>Overall</b>	<b>42.60%</b>	<b>47.70%</b>	<b>52.90%</b>	<b>62.80%</b>
<b>Gender</b>	NSD	NSD	NSD	NSD
Female	43.0%	46.9%	50.2%	62.9%
Male	41.8%	49.4%	58.2%	62.7%
<b>Age</b>	<b>(<math>\chi^2(3, N=465)=27.750, p&lt;0.001</math>)</b>	NSD	NSD	NSD
18-35	48.8%	47.6%	64.6%	69.5%
36-50	53.7%	51.9%	56.5%	67.6%
51-75	42.8%	46.5%	47.9%	60.9%
75+	13.3%	45.0%	48.3%	51.7%
<b>Provider Type</b>	NSD	<b>(<math>\chi^2(1, N=463)=35.710, p&lt;.001</math>)</b>	<b>(<math>\chi^2(1, N=463)=42.801, p&lt;0.001</math>)</b>	<b>(<math>\chi^2(1, N=463)=76.166, p&lt;0.001</math>)</b>
NP	43.0%	55.3%	61.2%	73.6%
MD/DO	41.1%	22.4%	25.2%	27.1%
<b>Visit Type</b>	<b>(<math>\chi^2(3, N=465)=18.103, p&lt;.001</math>)</b>	<b>(<math>\chi^2(3, N=465)=17.299, p=.001</math>)</b>	<b>(<math>\chi^2(3, N=465)=9.620, p=.022</math>)</b>	<b>(<math>\chi^2(3, N=465)=11.386, p=0.010</math>)</b>
Initial	60.7%	35.7%	46.4%	72.6%
Follow Up	43.2%	56.8%	61.4%	56.8%

*Note.* NSD = no significant difference.

**Research Question 3.** Along with primary care providers' documentation of education on lifestyle modification and correct medical management for the GERD patient, the researchers also evaluated if the primary care providers recommended follow-up visits to monitor symptoms relief or referral to gastroenterology as indicated by ACG guidelines for GERD. The distribution of follow-up schedules is shown in Figure 4.

**Table 2***Chi-Square Analysis of PPI Prescription by Demographic Groupings*

	PPI Prescribed	PPI Not Prescribed
<b>Overall</b>	<b>84.5%</b>	<b>15.5%</b>
<b>Gender (<math>\chi^2(2,N=84)=0.774, p=0.679</math>)</b>		
Female	88.14%	11.86%
Male	95.00%	5.00%
<b>Age (<math>\chi^2(6,N=84)=6.519, p=0.368</math>)</b>		
18-35	94.14%	2.86%
36-50	88.89%	11.11%
51-75	80.00%	20.00%
75+	100.00%	0.00%
<b>Provider Type (<math>\chi^2(2,N=84)=1.286, p=0.526</math>)</b>		
NP	90.67%	9.33%
MD/DO	75.00%	25.00%

**Figure 4***Distribution of Follow-up Schedules*

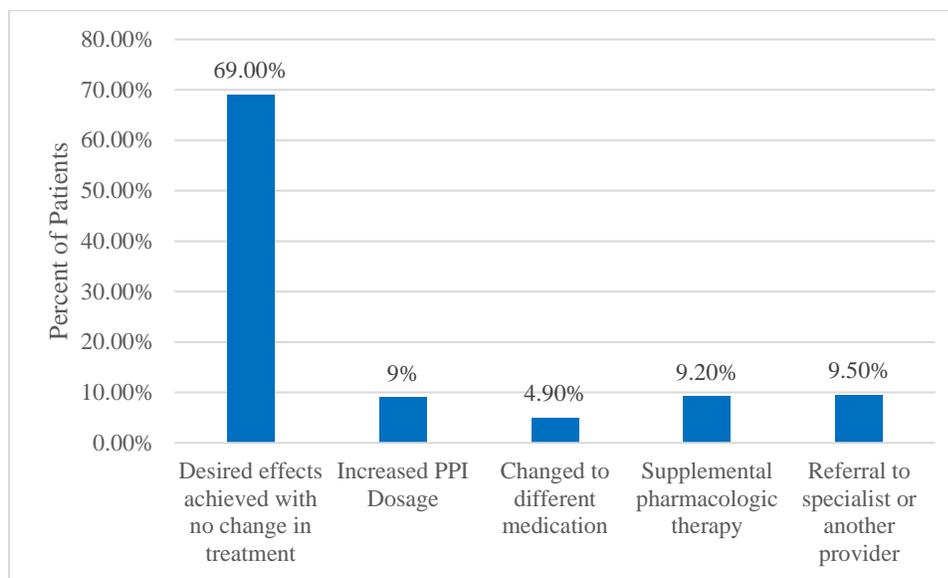
The most common follow-up frequency was four to six months (37.40%). As demonstrated in Table 3, there was a significant difference in follow-up schedules based

on age and provider type. Younger patients and patients seen by nurse practitioners were statistically more likely to have a shorter follow-up schedule. The responses to therapy noted in the patient's chart is shown in Figure 5, with the most common being "desired effect achieved."

**Table 3**

*Chi-Square Analysis of Follow-up Schedules by Demographic Groupings*

	<b>6-8 weeks</b>	<b>9-12 weeks</b>	<b>4-6 months</b>	<b>1 year or longer</b>	<b>Other</b>
Overall	22.8%	24.7%	37.4%	5.8%	9.2%
<b>Gender (<math>\chi^2(4,N=465)=4.681, p=0.322</math>)</b>					
Female	24.1%	24.1%	36.8%	4.6%	10.4%
Male	20.3%	25.9%	38.6%	8.2%	7.0%
<b>Age (<math>\chi^2(12,N=465)=42.298, p&lt;0.001</math>)</b>					
18-35	37.8%	19.5%	23.2%	1.2%	18.3%
36-50	26.9%	24.1%	32.4%	4.6%	12.0%
51-75	18.6%	26.0%	43.3%	7.4%	4.7%
75+	10.0%	28.3%	45.0%	8.3%	8.3%
<b>Provider Type (<math>\chi^2(4,N=463)=51.644, p&lt;0.001</math>)</b>					
NP	28.1%	22.5%	36.8%	2.5%	10.1%
MD/DO	5.6%	32.7%	38.3%	16.8%	6.5%
<b>Visit Type (<math>\chi^2(4,N=465)=92.023, p&lt;0.001</math>)</b>					
Initial	47.6%	17.9%	19.0%	2.4%	13.1%
Follow Up	37.5%	28.4%	23.9%	5.7%	4.5%
Chronic	7.0%	26.4%	51.5%	7.0%	7.9%
Acute	25.8%	22.7%	30.3%	6.1%	15.2%

**Figure 5***Prevalence of Responses Noted in Patient Charts***Summary**

The purpose of this study was to determine if Mississippi primary care providers are managing GERD according to the ACG guidelines. After examining the statistical analysis of the data collected from reviewing 465 patient charts, the researchers determined most providers are following guidelines, except for scheduled follow-up visits. Regarding the first research question, the recommendation of each lifestyle modification was closely correlated and almost always chosen. The lifestyle modification to avoid trigger foods was the most common recommendation at 62.80%, followed by avoid eating two to three hours before bed at 52.90%, elevating the head of the bed at 47.70%, and lastly, weight loss at 42.60%. Lifestyle modifications were recommended less often for patients with the single K21 GERD diagnosis.

Regarding research question two, patient visits were primarily conducted by a nurse practitioner. Chronic healthcare visits accounted for 48.80% of total visits with 192

charts requiring no change in PPI treatment. Of those initial visit charts, 84.5% (n=71) noted a PPI being prescribed compared to 15.5% reflecting no initiation of a PPI. There was no statistically significant difference in prescription prevalence based on patient demographics. A total of 44 patients (9.50%) received a referral to a specialist or another provider for further evaluation and treatment.

Analysis of the results regarding research question three revealed the most common follow-up visit schedule was four to six months (37.40%), followed by nine to 12 weeks (24.70%), six to eight weeks (22.80%), other (9.20%), and one year or longer (5.80%). Statistics disclose that younger patients and patients seen by a nurse practitioner were more likely to have a shorter follow-up schedule than older adults and those seen by another provider type. According to ACG guidelines, the suggested follow-up time to evaluate disease management and/or progression is eight weeks; therefore, based on statistics, the results from question three reveal primary care providers are not following ACG recommendations exclusively. Overall, statistics from the data collected revealed Mississippi primary care providers are frequently following ACG guidelines in the management of GERD.

## Chapter V: Implications

Gastroesophageal reflux disease is one of the most common gastrointestinal diseases seen by primary care providers and one of the most prevalent disorders, affecting approximately 30 million individuals in the United States. If not appropriately treated, GERD can lead to esophageal damage, which causes narrowing, erosions, or pre-cancerous lesions. Gastroesophageal reflux disease is associated with five to seven times increased likelihood of developing esophageal adenocarcinoma (Groulx et al., 2020). To avoid the serious complications related to GERD, management techniques must be initiated in a timely manner (Katz et al., 2021). The ACG is a national organization with a primary focus on advancing gastroenterology and improving patient care. The ACG released updated management and treatment guidelines for GERD in November 2021. According to the guidelines, a strong recommendation for patients with classic GERD symptoms of heartburn and regurgitation, who have no alarming symptoms, should begin an eight-week trial of empiric PPI once daily before a meal. For the management of GERD, ACG conditionally recommends lifestyle modification with elimination of trigger foods.

The purpose of this study was to determine if primary care providers manage GERD according to the current guidelines developed by the ACG by assessing the following research questions:

- For patients with a diagnosis of GERD, do primary care providers document education on lifestyle modifications according to the ACG guidelines?

- Do primary care providers prescribe PPIs for management of patients with a diagnosis of GERD according to the ACG guidelines?
- Do primary care providers recommend follow-up visits to monitor symptoms, and refer to gastroenterology as indicated by the ACG guidelines for GERD?

Pender's Health Promotion Model was the theoretical framework used to guide this study. Once the framework was determined, a retrospective chart review of 465 patients was performed utilizing a data collection tool and a data collection legend. A summary of the findings, implications of the results, and recommendations for further research are presented in this chapter.

### **Discussion of the Findings**

The retrospective chart review conducted by the researchers examined a total of 465 patient charts from four primary care clinics in the state of Mississippi. Statistics from the data revealed Mississippi primary care providers followed the ACG guidelines more than half the time in the management of GERD. The current findings reflect most primary care providers have implemented the latest evidence-based guidelines for the management of GERD. Tosetti et al. (2021) performed a study in primary care settings to identify the incidence of foods that triggered GERD symptoms. The study also aimed to verify if diet modifications would result in clinical improvement (Tosetti et al., 2021). The current researchers evaluated primary care providers' recommendations on lifestyle modifications, which included avoidance of trigger foods. The current study revealed the most common recommendation was to avoid trigger foods, which was recommended to 62.8% of patients. There was a positive correlation between the elimination of trigger

foods and improvement in clinical GERD symptoms experienced by patients, further validating the relevance of guideline number three introduced by Katz et al. (2021).

Edman et al. (2017) conducted a study that assessed the relationships between perceived stress, quality of life, and self-reported pain ratings in patients with GERD and other gastrointestinal diseases. The study primarily focused on the management of stress and factors that contribute to decreased quality of life (Edman et al., 2017). The study discovered increased perceptions of stress and decreased quality of life in the majority of 188 participants with a diagnosis of GERD. Similarly, the current study evaluated the management of GERD and lifestyle factors that contribute to the severity of the disease by analyzing primary care providers' documentation on lifestyle modifications. The current study did not collect specific data on the patients' reports of stress perception, quality of life, quality of sleep, and pain; however, evaluating such factors could be a suggestion for future research. Overall, the study performed by Edman et al. (2017) shared a similar purpose with the current study.

Vaezi et al. (2020) conducted a study to evaluate the effectiveness and safety of adding adjunct therapy in combination with the prescribed once daily PPI for treatment in patients with refractory GERD. Researchers in the study discovered that 30% of patients with GERD experience refractory symptoms despite adhering to the treatment plan of a once daily PPI (Vaezi et al., 2020). Likewise, the current researchers questioned if primary care providers manage GERD according to the ACG guidelines, which includes PPI administration and maintenance. The researchers determined through chart review if the addition of any adjunct pharmacological or nonpharmacological treatment was being utilized. While Vaezi et al. (2020) evaluated the effectiveness of adding a bile acid

sequestrant, the current researchers evaluated the addition of H2 receptor blockers and/or antacids only. Future research can question whether additional pharmacological adjunct therapy, like bile acid sequestrants, are utilized.

Walsh et al. (2016) conducted a quality improvement project with the purpose of developing a guideline for PPI use as well as deprescribing when appropriate. The study was conducted over 10 weeks and included a total of 14,000 participants, with the average patient age being 59 years (Walsh et al., 2016). Like the current study, participants were first selected via chart review if they were 18 years old or older with a diagnosis of GERD. Walsh et al. (2016) included active treatment with a PPI medication for eight weeks in the selection criteria. The researchers focused on appropriately documenting the indications and time limitations for PPI use, which implemented a time parameter for PPI administration to prevent the loss of therapeutic effectiveness. The study verified the overuse of PPIs in the population and reiterated the need for ongoing evaluation and management of GERD. The current researchers utilized the latest recommendations from the ACG guidelines for the management of GERD to determine if primary care providers are prescribing PPIs appropriately or if adjunct therapy or additional interventions are needed; however, the researchers did not evaluate if primary care providers are deprescribing PPIs as needed. Overall, the study performed by Walsh et al. (2016) was applicable to the current study due to the implementation of appropriate management of GERD in primary care.

Akst et al. (2014) performed a study to evaluate the national trends in the diagnosis and management of GERD. The results collected by Akst et al. (2014) correlated with several findings of the current research study. The researchers discovered

GERD was more frequently diagnosed in females compared to males (Akst et al., 2014). Likewise, statistical analysis from the current study revealed of the 465 patient charts reviewed, the majority were females (66%) compared to males (34%). Askst et al. (2014) also discovered among both genders, individuals aged 44 years or older had a diagnosis of GERD or were diagnosed more frequently, and counseling rates such as diet and nutrition, medication use, and knowledge of GERD diagnosis remained low throughout the years of the study. The statistical analysis of the current study revealed that of the 465 patient charts reviewed, the largest percentage of patients were aged 51 to 75 years old (46.2%). Counseling rates varied from younger patients, who were more likely recommended to lose weight, and elevation of the head of bed and avoidance of eating late were more likely recommended at follow-up and chronic visits. Overall, lifestyle modifications were not recommended consistently. Although the current researchers did not evaluate primary care providers' diagnosis of GERD, management of the condition was evaluated, which provided feedback for primary care providers to manage, treat, and educate patients on GERD.

Gawron et al. (2020) investigated endoscopy procedures that are often considered after the original GERD management option is unsuccessful. The researchers divided participants into complete responders, partial responders, and non-responders and evaluated the opinions of expert surgeons on the treatment of GERD (Gawron et al., 2020). Patient scenarios were created and managed accordingly through either pharmacological therapy or potentially surgical therapy. Overall, the researchers discovered agreement among the panel of experts for invasive therapeutic approaches for GERD in the event pharmacological therapy was ineffective. The study by Gawron et al.

(2020) served as a great foundation for the current study because Gawron et al. explored treatment options if management with PPI therapy was ineffective while also reiterating the importance of appropriate PPI use. The current researchers responded to a recommendation by determining what management interventions primary care providers initiated in situations of ineffective PPI therapy and whether the interventions included referral to gastroenterology and/or possible surgical management. Although the most common response to therapy noted in patient charts was “desired effects achieved” (69%), 9.5% of patients were referred to a specialist or another provider, 9.2% received supplemental pharmacologic therapy, 9% were prescribed an increased PPI dosage, and 4.9% were changed to a different medication.

The studies conducted by Tosetti et al. (2021), Edman et al. (2017), Vaezi et al. (2020), Walsh et al. (2016), Akst et al. (2014), and Gawron et al. (2020) contribute to the current study by focusing on the management of GERD. The studies varied in comparison, but each involved a certain aspect of ACG guidelines, if not multiple aspects. The current researchers focused on current ACG guidelines while reviewing the previous research and while the current research was conducted. The study revealed the majority of primary care providers frequently followed the current ACG guidelines in the management of GERD; however, future research should be performed because of the prevalence of GERD and the risk of complications if GERD remains untreated.

### **Limitations**

Throughout this project, multiple limitations to research were found that contributed to decreased accuracy of results and representation of findings. First, the data retrieved were from four small clinics in Mississippi, which does not inclusively

represent the vast general population. A larger research study throughout multiple states and regions could analyze if primary care providers are following ACG's guidelines of management and treatment of GERD. The lack of previous research about GERD management was also a barrier to research. There was very limited resources and data on proper management by primary care providers specific to the United States within the last five years. Another limitation was a health record conversion from paper charting to electronic health records during data collection at one clinic. This decreased the number of charts utilized for review due to the availability of charts compounded with the time constraints for completion of data collection.

Inconsistencies with coding of diagnoses was another limitation discovered during data collection. The various providers either documented by symptoms or diagnoses which provided decreased uniformity in coding. Also, as mentioned above, the research study had to be completed in under one year, which contributed to the limitations of the project. In addition, COVID restricted access to some clinics and fell directly in the middle of the research timeline, leading to possible skewing of results due to inadequate clinic care and follow-up. In 2020, clinics often did not see patients in person and the symptoms manifested by GERD potentially went untreated due to the urgency and fear of COVID.

Also, the ACG published new guidelines for the management and treatment of GERD in November 2021. Although the changes to the guidelines were not substantially different than those released in 2013, the new guideline provided a definite limitation to the research project since the guideline was released mid-project. The release of a new guideline could result in a hinderance to management and treatment of GERD by primary

care providers as well since there was no awareness of when the latest guidelines were due to be released. Lastly, another limitation of the project regarding the data collection worksheet was omission of an option for question number nine discussing responses to therapy and additional interventions. There was no option of discontinuation of PPI therapy according to the ACG guidelines, which could possibly skew the data for proper guideline adherence by primary care providers.

### **Conclusions**

The purpose of this study was to assess primary care providers' implementation of the American College of Gastroenterology's guidelines of gastroesophageal reflux disease management. The patients' charts contained at least one GERD related ICD-10 code, while some charts had more than one code. Ninety-five percent of patients presented with a diagnosis of GERD (ICD-10 code K21), 13% with heartburn (R12), and only 4% presented with dyspepsia (K30). Overall, more nurse practitioners than medical doctors were implementing ACG guidelines.

In addition to diagnosing GERD according to the ACG guidelines, documentation of lifestyle modifications, PPI prescribing, follow-up visits to monitor symptoms, and referral to gastroenterology as indicated were also reviewed to determine primary care providers' compliance. The documentation of lifestyle modifications included weight loss, elevation of head of the bed, avoidance of food two to three hours before bed, and avoiding trigger foods. Nurse practitioners and medical doctors both recommended weight loss at an average of 42% during each office visit. The other three lifestyle modifications were reviewed with patients twice as often by nurse practitioners than physicians. The researchers found there were

statistically significant differences on prevalence of lifestyle recommendations based on demographics. There were also no significant differences based on gender.

Regarding age, younger patients were more likely to be recommend all lifestyle changes except weight loss. According to ICD-10 code, all lifestyle recommendations were made less often for patients with a solo K21 GERD diagnosis.

The initiation of ant reflux medical therapy, in the form of PPI, was another aspect that assessed primary care providers' implementation of ACG guidelines and was found to be prescribed 90.67% by nurse practitioners and 75% by medical doctors. This result revealed the majority of primary care providers were compliant in prescribing PPI therapy to patients with GERD. The data showed that 100% of patients aged 75 and older were prescribed PPI therapy. The second largest age group to be prescribed PPI, at 94.14%, was ages 18 to 35 years. Age ranges 36 to 75 years were prescribed PPIs at an average of 80% to 89%. Overall, gender differences revealed males were prescribed PPIs at 95% and females at 88.14%.

Along with the accurate diagnosis of GERD and documentation of lifestyle modification, PPI therapy and documentation for follow-up visits were also reviewed in each patient chart to determine primary care providers' implementation of ACG guidelines. Distribution of follow-up visits were documented as six to eight weeks, nine to 12 weeks, four to six months, or one year or longer. The researchers also had another category for "other," which would be any other follow-up visit schedule other than listed previously. A large majority of patients were followed up in the four to six months range to document compliance of lifestyle modifications and medication regimen. The researchers discovered through the retrospective chart review and

statistical data collection and analysis that primary care providers in the state of Mississippi are compliant more than half the time in following ACG guidelines for the diagnosis and management of GERD.

### **Implications**

There are several implications that can be concluded from the results of this study. With GERD remaining prevalent in the United States, affecting 30 million Americans, all providers must diagnose and treat GERD based upon the guidelines set forth by the ACG as a standard of care. The ACG provides the latest recommendations of evidence-based research and practice regarding the management of GERD. The organization has been publishing evidence-based guidelines since 1943. Though the ACG is a longstanding organization, there were very few studies on providers' implementation of guidelines for GERD, as evidenced by the review of literature. With untreated GERD being problematic, primary care providers should remain current on guidelines to produce better patient outcomes.

### ***Implications for Clinical Practice***

Ineffectively managed GERD has been linked to esophagus damage, which causes narrowing, erosions, or pre-cancerous lesions. The results from this study were an evaluation of implementation of the latest guidelines for the management of GERD among providers in the primary care setting. The current study's results concluded most primary care providers were utilizing the guidelines published by ACG in the management of gastroesophageal reflux disease. This brings into focus a clearer reflection on primary care providers in the clinical practice setting regarding GERD management practices. The majority of providers from this study were nurse

practitioners, which implies nurse practitioners remain up to date on guidelines and practice accordingly. Gastroesophageal reflux disease is frequently diagnosed and managed in the primary care setting and should be addressed appropriately. Primary care providers should educate patients on the management of GERD, including the recommended use of PPIs. Providers should schedule a follow-up visit after an eight-week trial of PPI therapy to discuss the effectiveness of treatment. Lastly, providers should provide patient education on lifestyle modifications, and circumstances that warrant a referral to a specialist. For continued positive outcomes for GERD patients, primary care providers should continue to remain up to date on clinical practice by remaining knowledgeable of evidence-based guidelines.

#### ***Implications for Education***

The results of this study provide implications for education among primary care providers. Primary care providers face the challenge of staying up to date on the current guidelines for the diagnosis, management, and treatment of GERD. Statistically, the primary care providers in this study did an excellent job of following ACG evidence-based guidelines while managing GERD patients; however, with guidelines ever changing, providers must stay abreast to changes via continuing education opportunities.

#### ***Implications for Research***

There are many implications for future research that can be taken from the conclusions of this study. The research study revealed most all primary care providers were implementing the ACG guidelines in the diagnosis and treatment of GERD patients. The ACG released new updated guidelines in 2021; however, minimal changes were made from the older guidelines released in 2013. This study was limited to

the diagnosis of GERD with primary diagnosis codes of heartburn, dyspepsia, and GERD. A future study to include extraesophageal symptoms, such as chronic cough, throat clearing, hoarseness, globus, asthma, and laryngitis would benefit primary care practices. Future researchers could produce a larger scale study to include more than four clinics in Mississippi.

### ***Implications for Nursing Theory***

Pender's Health Promotion Model was used to guide this study. This theory provided a framework for the researchers to understand possible factors that affect patients' decisions regarding healthcare. The model focuses on encouraging wellness through a movement toward personal accountability and personal health practices. Pender based the theory on the idea that individuals who are motivated will modify lifestyle behaviors to attain certain goals and be in control of personal health. The focus throughout this study was the importance of primary care providers implementing the AGC guidelines for the diagnosis, management, and treatment of GERD. Patients were found to be more compliant with management of their GERD if primary care providers educated patients on the disease process.

### **Recommendations**

Upon completion of the study, and based upon the results yielded, there were multiple recommendations made for primary care providers and future researchers. The current study was confined to a small patient population that included a limited sample size of primary care providers. The results revealed nurse practitioners, medical doctors, and doctors of osteopathic medicine were the only providers included in the study, which indicated there were no physician assistants involved. A recommendation

for future research includes a study with a larger sample size involving more primary care providers. A larger research study across multiple states and regions would provide additional insight on the implementation of the current ACG guidelines for the management and treatment of GERD. The replication of this study may reveal the need for additional education regarding the updated guidelines.

All primary care providers should utilize the ACG guidelines for the management of GERD. The ACG guidelines are the latest evidence-based guidelines and are recommended to be followed by all primary care providers. To ensure providers are practicing by the current ACG guidelines, the need for education on the revised edition must be met. Becoming involved in professional organizations allows providers to be aware of guideline changes in a timely manner, as up to date information would be readily available. Remaining knowledgeable on the recommended guidelines for the management of GERD helps decrease the risk of serious complications.

The ACG has a primary focus of improving patient care, which is achieved through early initiation of appropriate management techniques. By conducting research on the management and treatment of GERD, the latest evidence-based guidelines are promoted to the primary care providers involved. To optimize the health of patients with GERD, future research needs to continue and expand to include more of the general population. Ultimately, this ensures primary care providers are made aware of the updated ACG guidelines and are better equipped to properly treat patients.

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## Appendix A

### ACG's Recommendations for Management of GERD

#### Diagnosis of GERD

##### Recommendation 1

For patients with classic GERD symptoms of heartburn and regurgitation who have no alarm symptoms, we recommend an 8-week trial of empiric PPIs once daily before a meal (strong recommendation, moderate level of evidence).

##### Recommendation 2

We recommend attempting to discontinue the PPIs in patients whose classic GERD symptoms respond to an 8-week empiric trial of PPIs (conditional recommendation, low level of evidence).

##### Recommendation 3

We recommend diagnostic endoscopy, ideally after PPIs are stopped for 2–4 weeks, in patients whose classic GERD symptoms do not respond adequately to an 8-week empiric trial of PPIs or whose symptoms return when PPIs are discontinued (strong recommendation, low level of evidence).

##### Recommendation 4

In patients who have chest pain without heartburn and who have had adequate evaluation to exclude heart disease, objective testing for GERD (endoscopy and/or reflux monitoring) is recommended (conditional recommendation, low level of evidence).

**Recommendation 5**

We do not recommend the use of a barium swallow solely as a diagnostic test for GERD (conditional recommendation, low level of evidence).

**Recommendation 6**

We recommend endoscopy as the first test for evaluation of patients presenting with dysphagia or other alarm symptoms (weight loss and GI bleeding) and for patients with multiple risk factors for Barrett's esophagus (strong recommendation, low level of evidence).

**Recommendation 7**

In patients for whom the diagnosis of GERD is suspected but not clear, and endoscopy shows no objective evidence of GERD, we recommend reflux monitoring be performed off therapy to establish the diagnosis (strong recommendation, low level of evidence).

**Recommendation 8**

We recommend against performing reflux monitoring off therapy solely as a diagnostic test for GERD in patients known to have endoscopic evidence of Los Angeles (LA) grade C or D reflux esophagitis or in patients with long-segment Barrett's esophagus (strong recommendation, low level of evidence).

**Management of GERD****Recommendation 9**

We suggest against performing reflux monitoring off therapy solely as a diagnostic test for GERD in patients known to have endoscopic evidence of LA grade C or D reflux

esophagitis or in patients known to have long-segment Barrett's esophagus (strong recommendation, low level of evidence).

#### **Recommendation 10**

We recommend weight loss in overweight and obese patients for improvement of GERD symptoms (strong recommendation, moderate level of evidence).

#### **Recommendation 11**

We suggest avoiding meals within 2-3hr of bedtime (conditional recommendation, low level of evidence).

#### **Recommendation 12**

We suggest avoidance of tobacco products/smoking in patients with GERD symptoms (conditional recommendation, low level of evidence).

#### **Recommendation 13**

We suggest avoidance of "trigger foods" for GERD symptom control (conditional recommendation, low level of evidence).

#### **Recommendation 14**

We suggest elevating head of bed for nighttime GERD symptoms (conditional recommendation, low level of evidence).

#### **Recommendation 15**

We recommend treatment with PPIs over treatment with H2RA for healing EE (strong recommendation, high level of evidence).

#### **Recommendation 16**

We recommend treatment with PPIs over H2RA for maintenance of healing for EE (strong recommendation, moderate level of evidence).

**Recommendation 17**

We recommend PPI administration 30-60 min before a meal rather than at bedtime for GERD symptom control (strong recommendation, moderate level of evidence).

**Recommendation 18**

For patients with GERD who do not have EE or Barret's esophagus, and whose symptoms have resolved with PPI therapy, an attempt should be made to discontinue PPIs (conditional recommendation, low level of evidence).

**Recommendation 19**

For patients with GERD who require maintenance therapy with PPIs should be administered in the lowest dose that effectively controls GERD symptoms and maintains healing of reflux esophagitis (conditional recommendation, low level of evidence).

**Recommendation 20**

We recommend against routine addition of medical therapies in PPI nonresponders (conditional recommendation, moderate level of evidence).

**Recommendation 21**

We recommend maintenance PPI therapy indefinitely or antireflux surgery for patients with LA grade C or D esophagitis (strong recommendation, moderate level of evidence).

**Recommendation 22**

We do not recommend baclofen in the absence of objective evidence of GERD (strong recommendation, moderate level of evidence).

**Recommendation 23**

We recommend against treatment with a prokinetic agent of any kind for GERD therapy unless there is objective evidence of gastroparesis (strong recommendation, low level of evidence).

**Recommendation 24**

We do not recommend sucralfate for GERD therapy except during pregnancy (strong recommendation, low level of evidence).

**Recommendation 25**

We suggest on-demand/ or intermittent PPI therapy for heartburn symptom control in patients with GERD (conditional recommendation, low level of evidence).

**Appendix B**  
**Institutional Review Board Approval**

To: Ms. Claire Harrelson and Mrs. Emily Stidham

From: Irene Pintado, IRB Chair 

Date: 03/22/2022

Project: Management of Gastroesophageal Reflux Disease (GERD) by Primary Care Providers in Mississippi.

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The Mississippi University for Women IRB committee has determined that your project is exempt under 45 CFR 46.101 (b)(4). Your project, Management of Gastroesophageal Reflux Disease (GERD) by Primary Care Providers in Mississippi, is a quality assurance project. If any changes are made to the study, the Committee must be notified. If the project is still running twelve months after the date of this memo, please be advised that we will need an update for our files.

Good luck with your work!

## Appendix C

### Letter of Informed Consent

To:

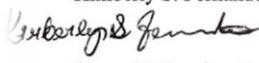
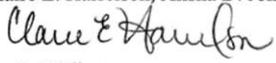
We are graduate students from Mississippi University for Women in Columbus, MS in the Family Nurse Practitioner Program. As required supplementation to the program, we are conducting a retrospective chart review to assess management of Gastroesophageal Reflux Disease (GERD) by primary care providers. Our data collection will include patients 18 years and older with a documented diagnosis of GERD from 2018 to present. We are requesting permission to gather information from electronic health records meeting the minimal criteria.

We are aware that inclusion of this research is strictly voluntary, and we agree to uphold all HIPAA requirements set forth by your practice and federal law. We will maintain confidentiality and patient privacy regarding all data collected from medical records obtained within your facility. All information gathered will be documented on a Data Collection Worksheet with the omission of any identifying information of the facility and patients. It will then be stored on an electronic flash drive in a secure location, accessible only to the pertinent researchers. Upon completion of the research project, all files containing information will be destroyed per HIPAA guidelines.

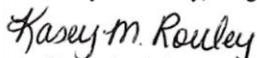
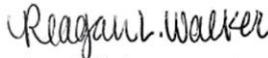
Since your participation is voluntary, you may withdraw your consent and participation in this study at any time. The concluding results of the study will be made available upon completion and may contribute to quality improvement measures implemented within your practice. If you have any questions or concerns pertaining to this study, please contact the following: Mrs. Emily Stidham, MSN, FNP-C (committee chair) at (662) 329-7323 or ejstidham@muw.edu.

Sincerely,

Kimberly S. Fernando, Claire E. Harrelson, Alisha D. Jones

Kasey M. Rowley, Reagan L. Walker

By signing below, you acknowledge review of this document and agree to the utilization of this clinic for the above-mentioned research project. You also understand HIPAA regulations will be strictly adhered to and confidentiality of the clinic and all charts included will be maintained, and the results of the study will be provided to you upon completion of the research project.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



**Appendix E**  
**Data Collection Worksheet Legend**

1. Patient Age:
  - A. 18-35
  - B. 36-50
  - C. 51-75
  - D. 75+
  
2. Patient Gender:
  - A. Female
  - B. Male
  - C. Not Disclosed
  
3. ICD-10 Code Used:
  - A. K21 GERD
  - B. K30 Dyspepsia (functional)
  - C. R12 Heartburn
  - D. Other
  
4. Provider Type:
  - A. NP
  - B. MD/DO
  - C. PA
  
5. Visit Type:
  - A. Initial
  - B. Follow up
  - C. Chronic
  - D. Problem Visit/Acute Visit

**If A, refer to questions 6-9.**

**If B, refer to questions 7-9.**

**If C, refer to questions 7-9.**

**If D, refer to question 7-9.**

6. PPI Prescribed on Initial Visit:
  - A. Yes
  - B. No
  - C. Other medication(s)

7. Lifestyle Recommendations: **Select all that apply.**
  - A. Weight loss
  - B. Elevate HOB
  - C. Avoid eating 2-3hr before bed
  - D. Avoid trigger foods
  
8. Follow Up Scheduled:
  - A. 6-8 weeks
  - B. 9-12 weeks
  - C. 4-6 months
  - D. 1 year or longer
  - E. Other
  
9. Response to Therapy/Additional Interventions: **Select all that apply.**
  - A. Desired effects achieved with no change in treatment
  - B. Increased PPI Dosage
  - C. Changed to different medication
  - D. Supplemental pharmacologic therapy such as: H2 Blocker, bile acid sequestrant, anti-acids, etc.
  - E. Referral to specialist or another provider