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*Research Article*

### RELATIONSHIP BETWEEN GERD AND HEARTBURN AND ASSOCIATED DISEASE IN KSA

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**Abstract:**

*The purpose of this study is to determine whether there is a significant association between GERD and heart burn, and common comorbidities and associated diseases. GERD is a chronic disease in which gastric contents reflux back into the esophagus. It's a reasonably prevalent condition among populations. Results of this study showed significant relationship between this condition and others like: DM, HTN, Anxiety, respiratory, colon diseases, in addition to connective diseases. This is consistent with other evidence on GERD and its associated conditions. Results also showed somewhat weak recognition of participants upon whether they have actually GERD, with only nearly 55% knowing the meaning of GERD.*

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**INTRODUCTION:**

GERD is a chronic disease in which gastric contents reflux back into the esophagus. Symptoms include acidic taste in the throat, heartburn, halitosis, chest pain, regurgitation, breathing issues, and tooth loss. Complications include esophagitis, esophageal stricture, and Barrett's esophagus, which eventually can lead to esophageal cancer if left untreated.

In Western countries, GERD affects approximately 10% to 20% of people and 0.4% newly develop the disease. For instance, nearly 3.4 million to 6.8 million of Canadians have GERD. The prevalence rate of GERD in developed countries is also linked with age, with adults aged 60 to 70 being the most commonly affected. In the United States, 20% of the population have symptoms in weekly and 7% daily. No data is available on sex predominance regarding GERD.

**METHODOLOGY:****1. Study design:**

An analytical cross-sectional study.

**2. Study setting and period:**

This is an analytical cross-sectional study conducted at universities, hospitals, malls (from general population), KSA from March 21, 2021 until October 2021

**3. Inclusion criteria:**

General population above 18 years

**4. Exclusion criteria:**

Any case under 18 years of age.

**5. Sampling method:**

Random sampling.

**6. Sampling size:**

Sample more than 500 case.

**Measurements:**

Variables

1. Sociodemographic characteristics: age, gender.
2. Disease related information: smoking, risk factors, chronic disease and knowledge about disease.

**Outcome measures:**

The outcome measure is by counting the ratio of the number of patients who suffering from GERD and patient suffering from heartburn this will be measured by:

Determining the extent of disease and risk factors in addition to other diseases.

Prevalence study: will be carried to test the questionnaire if easily understood and the response of the participants.

Data from the cross-sectional study will be used to calculate the sample size.

**Data management and analysis:**

Data were entered and analyzed using Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics were displayed as frequencies and percentages for categorical variables. Measures of central tendencies (the median), and measures and dispersion (minimum – maximum) were used to summarize continuous variables, as the continuous variables were not normally distributed when tested by Shapiro-Wilk test. Univariate analysis was performed to investigate the association between the exposure factors with the outcome on the one hand, this was performed using Chi-squared test. Multivariate analysis to investigate factors independently was performed using binary logistic regression. P value was set at a significance level of < 0.05.

**Literature review:**

A healthy individual typically has a physiological backflow of the gastric contents to the esophagus. When these refluxes cause uncomfortable symptoms such as heartburn and/or acid regurgitation, additional to an injury of the esophageal mucosa for not less than once per week, that is called "gastroesophageal reflux disease (GERD).

Risk factors of GERD include obesity, smoking, pregnancy, hiatus hernia, and certain medicines. Those medications include benzodiazepines, calcium channel blockers, tricyclic antidepressants, NSAIDs, certain asthma medicines. Acid reflux is due to poor closure of the lower esophageal sphincter, which is at the junction between the stomach and the esophagus.

Symptomatology of GERD has a wide spectrum, starting from acidic taste, heartburn and regurgitation, which are the most common symptoms of GERD in adults. Less common symptoms can present as pain with swallowing/sore throat, hypersalivation, nausea, chest pain, along with cough.

GERD in some occasions injures the esophagus. That includes:

Reflux esophagitis – inflammation of esophageal covering epithelium that can ulcerate near the gastroesophageal junction. This can result in another, which is esophageal stricture, resulting in narrowing of the esophageal diameter.

Barrett's esophagus, which describes intestinal metaplasia (changes of the epithelial cells from

squamous to intestinal columnar epithelium) of the distal part of the esophagus. Barret's esophagus also increases the risk for esophageal adenocarcinoma if left untreated.

GERD also causes laryngeal injury sometimes. Other complications include aspiration pneumonia.

Compared to studies conducted in the Western countries, there is limited evidence on GERD prevalence in the MENA region. However, in one study conducted in Saudi Arabia, GERD prevalence was 28.7%, more in divorced or widowed women (nearly 34%), with no statistically significant association with age, race, gender, level of education, residence status, occupation or blood group.

### RESULTS:

Descriptive data:

Total count of sample is 863 cases. Age distribution as shown in the figure falls into 5 groups, 18 – 25 with 41.7%, 26 – 33 with 18.5%, 34 – 41 with 16.6%, 42 – 49 with 10.4%, and 50 years and more with 12.7%. Sex distribution is

39.6% males, and 60.4% females. Smoking categories are divided into three: non-smokers with 73.1%, smokers with 20.5%, and ex-smokers with 6.4%. Conditions associated with GERD are prevalent on participants as follows: obesity (12.1% of cases), hiatal hernia (8.3%), connective tissue disease (e.g. scleroderma) (0.7% of cases), and delayed emptying of gastric contents (10.5%).

When asked specifically about GERD, 16.9% of participants reported having GERD, while when asked about heartburn, 15.9% reported having frequent heartburns, and 41.7% reported having some heartburns at some occasions.

Comorbidities in participants are as follows: DM (5.6%), HTN (7.8%), Colon disease (15.2%), cardiovascular disease (2.7%), respiratory disease (4.2%), Anxiety (20%), Recurrent otitis media (2.9%), and sinusitis (20.2%).

When asked about prior knowledge of GERD, 55.9% of participants knew about GERD participating in the study.

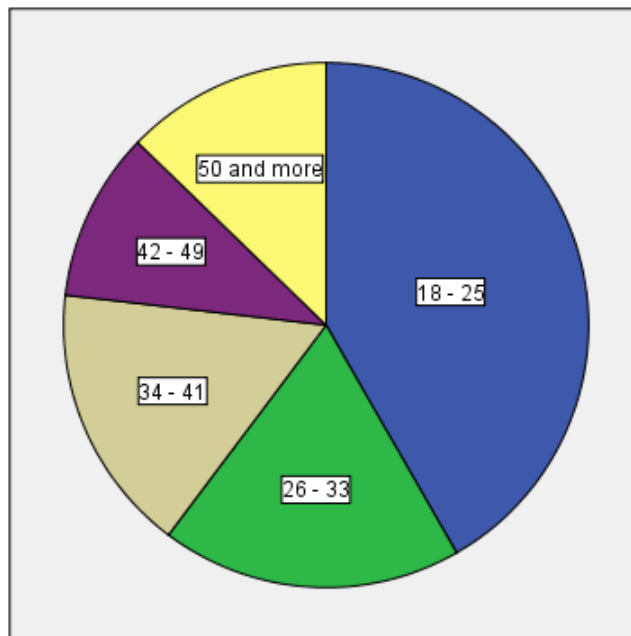


Figure 1: Age distribution

Tabulation of relationship between GERD and heartburn, and associated conditions on the other hand.

	GERD (n)	GERD (p-value)	Heartburn (n)	Heartburn (P-value)
Smoking	32	.506	110	.239
Ex-smoker	12		34	
Obesity	20	.502	70	.061
Hiatal Hernia	16	.210	40	.522
C.T. disease	3	.03	6	.099
Delayed gastric emptying	19	.287	58	.369
DM	16	.002	37	.009
HTN	20	.03	48	.002
CVD	6	.234	14	.823
Colon disease	43	.000	104	.000
Respiratory disease	13	.002	27	.072
Anxiety	43	.002	125	.000
Recurrent otitis media	7	.134	20	.002
Sinusitis	46	.000	119	.000

Significant association is found between: GERD and connective tissue disease, DM, HTN, colon disease, Respiratory disease, Anxiety, and sinusitis. Heartburn complaint is significantly related to DM, HTN, colon disease, anxiety, recurrent otitis media, and sinusitis.

#### DISCUSSION:

This study is showing similar evidence found in many regional and international studies concerning different aspects of GERD.

According to Marco G. Patti et. all, 40 – 60% of connective tissue diseases patients has GERD. This supports our finding that is suggesting a strong significant relation between experiencing GERD, and having a connective tissue disease.

Comorbidities also are associated with GERD. In a study published by H. Kase, et. all, nearly 24% of diabetics has GERD, in some degree, and this also supports our finding of significant relationship with DM. HTN is also associated with GERD, this is according to our study, and another research study done by Gudlaugsdottir S, et.all, which resulted that HTN is significantly associated with reflux esophagitis. Respiratory diseases including otitis media and sinusitis are found to be associated with GERD. This is true according to Fouad YM, whose study included a clear association between bronchial asthma and chronic cough, and having GERD symptoms. As for otitis media. There is limited evidence on the relationship with GERD in adults. However, its treatment and outcome can be improved with treating GERD with anireflux drugs in pediatric population.

Anxiety association is supported by a large cohort Australian study, that showed association between GERD, and anxiety, sleep disorders, and depression.

On the other hand, Obesity, which is a main risk factor of GERD according to several studies included in an epidemiological review by Hashem El-Serag, et.all, doesn't have a significant relationship with GERD, this could be not clearly seen because the study didn't contain an objective measurement of obesity, which makes a subjective estimation very poor.

#### Data availability:

Data is available upon reasonable request.

#### Conflict of interest:

Authors have no conflict of interest to declare.

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#### Ethical considerations:

Administrative approval is sought from the unit of biomedical ethics research committee Ethical approval is sought from the ethical committee of the faculty of medicine, King Abdelaziz University. An informed consent is sought from the participants.

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