

# Gastroesophageal Reflux Disease in Iran: SEPAHAN Systematic Review

## No. 2

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Date of Submission: Feb 21, 2011

Date of Acceptance: Apr 18, 2011

**How to cite this Article:** Fazel M, Keshteli AH, Jahangiri P, Daneshpajouhnejad P, Adibi P. Gastroesophageal reflux disease in Iran: SEPAHAN systematic review No. 2. *Int J Prev Med* 2012; Special issue, S10-17.

### ABSTRACT

**BACKGROUND:** Gastroesophageal reflux disease (GERD) is one of the most prevalent disorders affecting gastrointestinal tract with a wide range of frequency around the world. In this study, we aimed to review all of the published studies about GERD's prevalence in Iran systematically.

**METHODS:** We searched bibliographic databases including PubMed and Google Scholar and local databases (Scientific Information Database and Iran Medex) to achieve all relevant articles to our subject and included them based on predefined inclusion criteria.

**RESULTS:** Twenty-two articles were included in the study to estimate the prevalence of GERD in Iran. Based on these articles, the prevalence of GERD in Iran was within the range of 1.9 to 52%.

**CONCLUSIONS:** Due to the differences between studies, such as characteristics of the sampled population and the diagnostic criteria, the reported prevalence of GERD was remarkably different in the reviewed studies. Nonetheless, because of the high prevalence of GERD in Iran, conducting large-scale epidemiological studies should be considered to determine factors associated with the prevalence of GERD to prevent and control it.

**Keywords:** Gastroesophageal Reflux Disease, Heartburn, Acid Regurgitation, Iran, Systematic Review

### INTRODUCTION

Gastroesophageal reflux disease (GERD) is one of the most common disorders affecting the gastrointestinal (GI) tract. The major cause of it is the abnormal reflux of gastroduodenal contents into the esophagus,<sup>[1]</sup> which leads the patient to other complications including esophageal and extra-esophageal problems. Some of the considerable esophageal symptoms include esophagitis, esophageal ulcer, upper GI bleeding and Barrett's esophagus that could deteriorate patients' situation.<sup>[2]</sup> Extra-esophageal complications such as cardiac, respiratory and oropharyngeal diseases may affect the quality of life too.<sup>[3]</sup> Although a number of studies have been conducted to determine the prevalence of GERD in different populations in Iran, lack of a gold standard to diagnose the disorder properly has remained an important limitation.<sup>[1,2,4-6]</sup>

In the U.S., almost half of people experience reflux monthly, and 20% weekly.<sup>[7-9]</sup> Formerly, using the diagnostic criteria of "heartburn and/or acid regurgitation presented at least weekly", the considerable prevalence of 10-20% was estimated for GERD in Europe and North America; in Asia however, the prevalence was estimated to be lower.<sup>[10]</sup> In the epidemiological studies

conducted in Iran so far, a very wide range of prevalence has been reported for GERD, which was mainly due to the different methodologies or definitions. Based on significant dysfunctions caused by this disorder, considerable economic burden<sup>[11]</sup> and lack of sufficient population-based studies on the prevalence of GERD in Iran, it seems to be necessary to review the epidemiology of this disease and make recommendations for future studies.

Herein, we systematically reviewed the published literature on epidemiology of GERD in Iran. It is worthy to note that this review provided background knowledge for the “Study on the Epidemiology of Psychological, Alimentary Health and Nutrition” (SEPAHAN). The data of SEPAHAN will explore the epidemiology of GERD and functional gastrointestinal disorders and their related risk factors in Isfahan province.<sup>[12]</sup>

## METHODS

### *Search strategy:*

In January 2012, electronic databases including Google Scholar, PubMed, Iran Medex and Scientific Information Database were searched. The keywords used to search Google Scholar included “Gastro esophageal reflux disease”, or “GERD”, and “prevalence” and “Iran”. In addition, we searched PubMed using (“gastroesophageal reflux”[MeSH Terms] OR (“gastroesophageal reflux disease”[All Fields]) AND (“iran”[All Fields])) as search query.

After searching these electronic bibliographic databases, we also looked for evidences in Persian language. Two Iranian databases were searched including Scientific Information Database (www.sid.ir) and Iran Medex (www.iranmedex.com); and, we used GERD, gastroesophageal reflux disease, heartburn, acid regurgitation, reflux and their equivalents as keywords in Persian.

Hand searching of the reference lists of the related articles was also performed to find any potential relevant articles that may have been missed using the computer-assisted search.

### *Selection of studies:*

Two investigators independently evaluated all articles based on their titles and abstracts and their relevance to our aim. Studies that were (1)

designed to estimate the epidemiology of GERD among Iranians; (2) published in full manuscript; and (3) were in English or Persian language, were selected. Studies that were carried out in highly selected groups (e.g. pregnant women, diabetic patients) were excluded.

### *Data extraction:*

We extracted data presented in the articles on first author of the article, the province and city where the study was performed, sampled population, sample size, method of data collection, and demographic characteristics presented in the article, including age, gender, body mass index (BMI), smoking and marital status. Data on the diagnostic criteria used in each study and the reported prevalence was also extracted. The extracted data were summarized in table 1.

## RESULTS

Searching PubMed database, resulted in 66 articles and searching the Google Scholar with the specified keywords, resulted in 895 articles. Searching Persian databases including Iran Medex and Scientific Information Database resulted in identification of 31 relevant articles.

After screening of the titles and available abstracts of all articles based on the inclusion criteria by two independent reviewers, 27 articles were found to be eligible for the inclusion to the study.

Four additional articles were excluded due to recruiting a highly selected group.<sup>[12-15]</sup> One study was found to be a duplicate and was excluded.<sup>[17]</sup> Finally, 22 studies were selected for evaluation.<sup>[6, 11, 18-37]</sup>

Based on the articles included in this review and according to the different definition criteria that were used in these studies, the prevalence of GERD was as low as 1.9% to as high as 52%.<sup>[6, 11, 18-37]</sup> (Table 1).

## DISCUSSION

We found 22 articles that met our inclusion criteria. In these studies, prevalence of GERD were estimated within the range of 1.9% to 52%.<sup>[6, 11, 18-37]</sup> This wide range of reports could be the consequence of some differences in various methodological aspects of these studies (e.g. definition criteria, sampled population, sample size and data collection methods).

**Table 1.** Prevalence of gastroesophageal reflux disease in Iranian studies

#	Author	City	Study Population	Mean Age $\pm$ SD	Sample Size	Method	Definition	Reported prevalence								
								Heartburn			Acid Regurgitation			GERD		
								Daily	Weekly	Monthly	Daily	Weekly	Monthly	Daily	Weekly	Monthly
1	Nourae et al.(6)	Tehran	General population	36.1 $\pm$ 12.4	1202	Interview + Questionnaire	heartburn and/or acid regurgitation not mentioned	-	-	-	-	-	-	1.9%	6.8%	18.4%
2	Pourhoseingholi et al.(18)	Tehran, Varamin, Firoozkoush, Pakdasht, Damavand	General population	Not mentioned	30334	Interview + Questionnaire	heartburn and/or acid regurgitation not mentioned	-	8.6%	-	-	-	-	-	-	-
3	Rogha et al.(19)	Isfahan	General population	38.8 $\pm$ 12.9	2400	Interview + Questionnaire	heartburn and/or acid regurgitation	-	-	-	-	-	-	12.1%	12.9%	21.5%
4	Pourshams et al.(20)	Tehran, Gonbad	University students, Blood donors, Gonbad General population	University students: 19.1 $\pm$ 2.1 Blood donors: 37.3 $\pm$ 10.8 Gonbad general population: 51.3 $\pm$ 11.7	University students: 3008 Blood donors: 3517 Gonbad general population: 1066	Interview + Questionnaire	heartburn and/or acid regurgitation	-	-	-	-	-	-	More than 3 times: 2.1%, Blood donors: 4.7%, Gonbad: 18.4%	1-3 times : 16%, Blood donors: 8.8%, Gonbad: 15.1%	1-2 times: 5.1%, Blood donors: 5.6%, Gonbad: 12.7%
5	Ehsani et al.(21)	Tehran	General population	Range: 20-90 years	700	Interview + Questionnaire	heartburn and/or acid regurgitation	-	-	-	-	-	-	-	-	20.9%
6	Mahmoudi et al.(22)	Tehran	Medical students	Not mentioned	3008	Interview + Questionnaire	heartburn and/or acid regurgitation during past 12 months	-	-	-	-	-	2%	1-2 times: 7%	1-3 times per month: 16%	Once per 3 months : 10%
7	Mostaghni et al.(23)	Fars Province	Qashqai migrating nomads	43.1 $\pm$ 14.2	717	Interview + Questionnaire	heartburn and/or acid regurgitation at least once a week during past 12 months	-	-	-	-	-	-	33%	-	-

Table 1: Continue

8	Aletaha et al.(24)	Gonbad Kavoods, Kalale	General population	27.35±6.1	1000	Interview + Questionnaire	heartburn and/or acid regurgitation at least once a week during past 12 months	-	-	-	-	-	-	-	12.3%	-
9	Nourai et al.(25)	Tehran	General population	Range: 18-65years	2561	Interview	heartburn and/or acid regurgitation at least once a week during past 6 months	-	-	-	-	-	-	-	21.2%	-
10	Nasseri-Moghaddam et al.(26)	Tehran	General population	34.8±13	2057	Interview + Questionnaire	heartburn and/or acid regurgitation during past 12 months	Daily or Weekly : 9.6%	Monthly or Yearly: 10.6%	Daily or Weekly: 12.2%	Monthly or Yearly: 22.4%	Daily or Weekly: 18.2%	Monthly or Yearly: 28.7%			
11	Solhpour et al.(27)	Damavand, Firoozkouh	General population	37.9±14.3	5733	Interview + Questionnaire	heartburn and/or acid regurgitation once a week during last 3 months	-	-	-	-	-	-	-	5%	-
12	Moghimi-Dehkordi et al.(11)	Tehran	General population	>18	18180	Interview + Questionnaire	heartburn and/or acid regurgitation once a week during last 3 months	-	-	-	-	-	-	-	2.8%	-
13	Saberi 1 et al.(28)	Kashan	Shift working nurses	37.9	160	Questionnaire	presence of heartburn and/or acid regurgitation "most of the time" in the past 4 weeks		39%		52%				-	
14	Khoshbaten (29)	Tabriz	General population	Not mentioned	4207	Interview + Questionnaire	heartburn occurring at least thrice in the recent two weeks	-	2.7%	-	-	-	-	-	-	-
15	Somi et al (30)	Tabriz	Hospital staffs	40.02±10.72	530	Interview + Questionnaire	heartburn and/or acid regurgitation during the past 12 months	-	-	-	-	-	-	-	26.8%	34.1%

Table 1: Continue

16	Saberi-Firoozi et al (31)	Shiraz	General population	49.90± 11.14	1978	Interview + Questionnaire	heartburn and/or acid regurgitation at least three times a week during the past 12 months	-	-	-	-	-	-	-	15.4%	-
17	Honarkar et al (32)	Bam	People injured in earthquake	30±14	737	Interview + Questionnaire	not mentioned	25.5%			10%				-	
18	Moghimi-Dehkordi et al.(33)	Damavand, Firoozkouh	General population	Not mentioned	782	Interview + Questionnaire	heartburn and/or acid regurgitation during the past 6 months	-	-	-	-	-	-	-	29.2%	-
19	Somi et al.(34)	Tabriz	University students	22.48± 1.98	620	Interview + Questionnaire	heartburn and/or acid regurgitation at least once a week	-	-	-	-	-	-	-	6.3%	13%
20	Safaei et al(35)	Firoozkouh	General population	50.68±17.73	571	Interview + Questionnaire	heartburn during the last three months with onset at least six months before diagnosis	28%								
21	Rezailashkajani et al(36)	Tehran	Patients referred for upper endoscopy to an outpatient gastroenterology clinic	44.7± 15	501	Interview + Questionnaire + endoscopy	any evidence of reflux esophagitis in endoscopy or heartburn and/or acid regurgitation at least once a week during the past 3 months	-	-	-	-	-	-	-	65%	-
22	Hoseini-assal et al(37)	Shahrekord	General population above 20 years old	37.9± 14.3	4762	Interview	heartburn and/or acid regurgitation at least once a month during the past 12 months	-	-	-	-	-	-	-	-	25.5%

SD: Standard deviation, GERD: Gastroesophageal reflux disease,

In Iranian studies, GERD was defined as the presence of heartburn and/or acid regurgitation during a “specified period”. In these studies, the presence of GERD symptoms were investigated on daily, weekly, monthly, or yearly basis. Therefore, it is rational to assume that studies reporting the prevalence of GERD on a weekly basis of the presence of heartburn and/or acid regurgitation, would present a lower rate, in comparison to those defining GERD based on the presence of symptoms during one year.

Difference in sampled populations can be another reason for the heterogeneity in the prevalence of GERD in Iranian studies. For example, in Tehran, the prevalence of GERD in medical students<sup>[22]</sup> and the general population<sup>[26]</sup> was 35.9% and 18.2%, respectively. Another study that was carried out on shift-working nurses reported the prevalence of heartburn and acid regurgitation to be 39% and 52%, respectively.<sup>[28]</sup> Therefore, when different studies are interpreted in Iran, it is very important to consider the characteristics of the sampled population.

There were also some population-based studies that investigated the epidemiology of GERD in Iran.<sup>[6,11,18,19,24-27,29,31,33,35]</sup> One study, which was conducted on a large sample (30334) of people living in Tehran, reported that the prevalence of heartburn was 8.6%.<sup>[18]</sup> The prevalence of GERD in other population-based studies in Tehran was 2.8-29.2%.<sup>[6,11,25,26,33,35]</sup> The study in Shiraz reported that of the 1978 subjects studied, 13.4% had GERD.<sup>[31]</sup> The prevalence of GERD in Gonbad and Kalaleh (North of Iran) was 12.3%.<sup>[24]</sup> Another study reported that the prevalence of Heartburn was 2.7% in Tabriz.<sup>[29]</sup> In Isfahan, Rogha et al. reported the prevalence of heartburn and/or acid regurgitation on a weekly and monthly basis, were 12.9 and 21.5%, respectively.<sup>[19]</sup> Different definition criteria, differences in the social factors, cultural background and lifestyle in different cities or populations could be the reason of such significant variations in the prevalence of GERD in different studies.

In Iranian studies, the prevalence of GERD was investigated in relation with different demographic or lifestyle related factors too. The role of Age<sup>[6,11,18,21,23-27,30-35]</sup> gender,<sup>[6,11,18-20,22-27,30-34,38]</sup> overweight/obesity<sup>[19-21,23,24,26,30,31,34,37]</sup>, education<sup>[19-22,24,26,30,31,34,37]</sup>, and marital status<sup>[18,23,26,34]</sup>

have been investigated in different studies with controversial results. However, smoking was indicated to have a relationship with increased prevalence of GERD.<sup>[20,21,26,30,38]</sup>

GERD is a highly prevalent disorder worldwide. However, its epidemiology differs significantly in different societies. Western countries are more affected in comparison to the Asian communities because of industrialization and its effects on individuals' lifestyles.<sup>[7-9,38-42]</sup> Half of Americans experience GERD symptoms monthly, 20% weekly and more than 7% have symptoms of GERD daily.<sup>[7-9]</sup> The prevalence of GERD in Asian communities was reported to be 3.1-8.5%.<sup>[43-46]</sup>

Although, the prevalence of GERD in Iran varies significantly in different studies, many studies reported it to be high. In the future, the prevalence of GERD may increase due to Western lifestyle that is currently observed in Iran and many Asian countries. To conduct large-scale population-based studies, employing valid assessment tools is highly suggested to investigate different epidemiological aspects of GERD in Iran.

## ACKNOWLEDGMENTS

This study was carried out by a grant from the Vice Chancellery for Research and Technology, Isfahan University of Medical Sciences.

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**Source of Support:** Nil **Conflict of Interest:** None declared