



Irritable Bowel Syndrome Demographics: A Middle Eastern Multinational Cross-sectional Study

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ABSTRACT

BACKGROUND:

Irritable bowel syndrome (IBS) is the most frequent functional gastrointestinal (GI) disorder. In this study, we aimed to evaluate the different aspects of IBS among Middle Eastern residents.

METHODS:

During the study period, patients attending gastroenterology clinics of nine tertiary referral centers in four Middle Eastern countries (Iran, Egypt, Kuwait, and Turkey) were evaluated by Rome IV diagnostic criteria, and those who fulfilled the diagnostic criteria of IBS were asked to fill in a questionnaire covering different demographics and clinical aspects.

RESULTS:

Overall, during a 6-month period, 509 patients with IBS were included. 41.3% of the participants were male (210 patients), and 37.4% of them had academic education. 50% of the participants were Caucasian, and 34% were Arab, and originally, they were citizens of 18 countries. 77.4% of the participants were residents of subtropical areas, while 22.2% were living in temperate regions. The average age of the participants during the first presentation in subtropical and temperate areas were 38.4 ± 12.19 and 38.06 ± 12.18 years, respectively ($P = 0.726$). The most common subtypes of IBS in subtropical areas were unclassified (IBS-U, 44.4%), constipation dominant (IBS-C, 27.6%), mixed pattern (IBS-M, 21%), and diarrhea dominant (IBS-D, 6.8%) in descending order while in temperate areas the most common subtypes were IBS-U (43.3%), and IBS-D (22.1%), respectively ($P < 0.001$). Besides abdominal pain, the most common symptom of patients in each region was bloating (62.2% and 68.1%, respectively, $P = 0.246$). The rate of depression and anxiety were significantly higher among the residents of temperate areas in comparison with subtropical regions (41.6% vs. 16.5% and 80.5% vs. 58.4%, respectively, $P < 0.001$).

CONCLUSION:

Although the average age of IBS presentation is the same in subtropical and temperate areas, it seems that in temperate areas, the rate of IBS-D is more prevalent than in subtropical regions. The rate of anxiety and depression are significantly higher among those who searched social media and the internet to get information about their problems.

KEYWORDS:

Irritable bowel syndrome, Subtropical areas, Temperate regions, Bloating

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INTRODUCTION

Irritable bowel syndrome (IBS), which is characterized by abdominal pain and changing bowel habits, is the most common functional gastrointestinal (GI) disorder.¹ While the prevalence and clinical features of IBS greatly vary throughout the world, this chronic disorder has a noticeable impact on work productivity and quality of life, all among human societies.²⁻⁵ ROME (Functional Bowel Disorders and Functional Abdominal Pain, Multinational Working Teams to Develop Diagnostic Criteria for Functional Gastrointestinal Disorders) criteria, which is developed to screen for functional GI disorders, serves as inclusion criteria in clinical trials and supports epidemiological surveys. Although the definition criteria for IBS was developed by ROME foundation, it was revised several times, and the latest is ROME IV, which was released a few years back.⁶⁻⁹

The true economic burden of IBS is unclear, but it has been suggested that the annual direct costs for IBS are around \$US 41 billion in the eight most industrialized countries, and the direct cost per-patient for IBS ranged from \$1562 to \$7547 per year.^{10,11} Considering the global prevalence of 10%-25% worldwide, it is mandatory to find strategies to reduce the direct costs of IBS, including physicians and patients education, paramedical-based education and therapy, early consideration of psychosocial issues, and avoidance of unnecessary investigations by optimizing the doctor-patient relationship.^{10,12,13}

This international multicenter study was designed to evaluate the different aspects of IBS based on variables such as geographic region and climate to further clarify any novel dimension of this multi-modal entity for better recognition and diagnosis.

MATERIALS AND METHODS

During a 6-month-period, characteristics of the patients with IBS who attended outpatient GI clinics of nine tertiary centers in four countries (Egypt, Kuwait, Iran, and Turkey) with different climates (sub-tropical vs. temperate) were recorded by filling a questionnaire to evaluate different aspects of IBS based on geographic region (Figure 1). Diagnosis of IBS in the current study was confirmed by academic gastroenterologists following the ROME IV criteria with differentiation of the different sub-types of IBS (9). Inclusion criteria

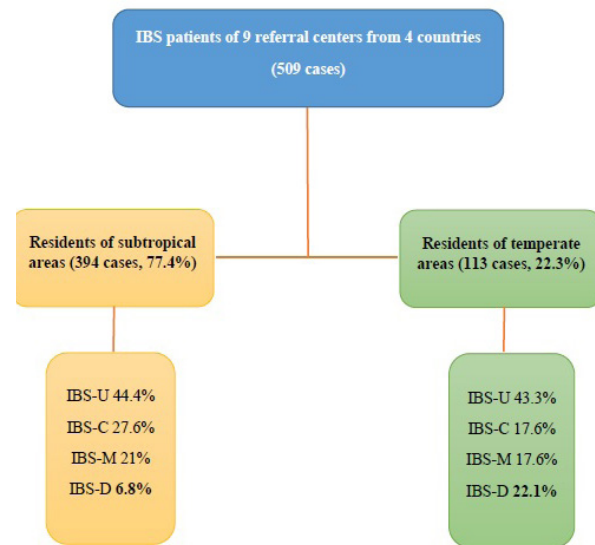


Fig. 1: Flowchart of the study.

were fulfilling the diagnostic criteria of IBS according to Rome IV criteria and acceptance of participating in the study. The exclusion criteria were severe GI disorders such as uncontrolled inflammatory bowel disease or hepatic failure, history of abdominal surgery, presence of any warning symptoms like recent significant weight loss or nocturnal diarrhea, bloody diarrhea, dysphagia, and any uncontrolled psychologic condition.

The collected data were gathered into a mother table and then inserted into the SPSS software, version 19 to be analyzed. Data from the analysis were presented in charts and graphs.

RESULTS

Patients Demographics

Overall during a 6-month-period, 509 patients with IBS from nine referral centers in four countries were included (Figure 2). 41.3% of the participants were male (210 patients) and 37.4% of them had academic education. The average age of the participants was 39.7 years with an age range of 15 to 79 years (mean for men 40.3 years, range: 16 to 79 & mean for women 39.2 years, range: 15 to 75 years). 71.5% of cases were married, and 24.5% were single. Socioeconomically, 24.7% had high monthly income, 49.3% had moderate, and 25.9% had low income. The average number of family members per living area was 4.3 persons (range 1 to 16).

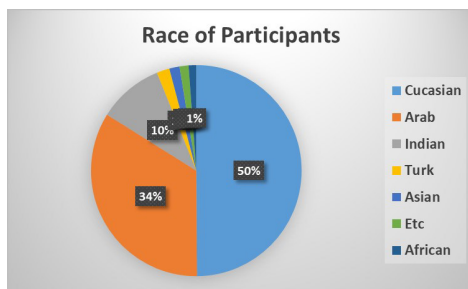


Fig. 2: Race of participants.

Geographical Peculiarities

50% of the participants were Caucasians, and 34% were Arabs. They were originally citizens of 18 countries (Figures 2 and 3). 77.4% of the participants were residents of subtropical areas, while 22.2% were living in temperate regions. The average age of the participants during the first presentation in subtropical and temperate areas were 38.4 ± 12.19 years and 38.06 ± 12.18 years, respectively ($P = 0.726$).

Disease Characteristics

The average duration of suffering from IBS was 5.6 years (from 6 months to 20 years). The most common sub-types of IBS in subtropical areas were unclassified (IBS-U, 44.4%), constipation dominant (IBS-C, 27.6%), mixed pattern (IBS-M, 21%), and diarrhea dominant (IBS-D, 6.8%) in descending order while in temperate areas the most common subtypes were IBS-U (43.3%) and IBS-D (22.1%), respectively ($P < 0.001$, Figure 4). Besides abdominal pain, the most common symptom of patients in each region was bloating (62.2% and 68.1%, respectively,

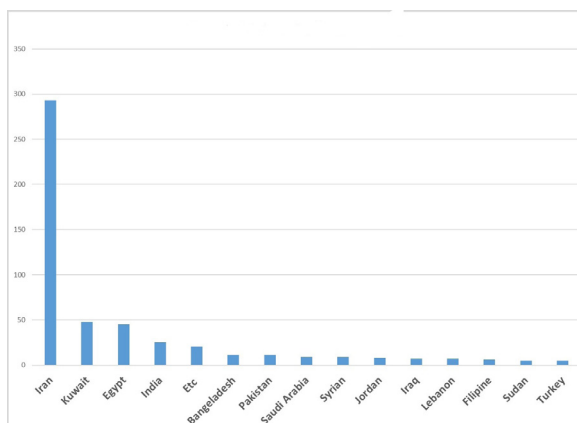


Fig. 3: Countries of origin of the participants.

$P = 0.246$). The rate of depression and anxiety were significantly higher among the residents of temperate areas in comparison with subtropical regions (41.6% vs. 16.5% and 80.5% vs. 58.4% respectively, $P < 0.001$, Figure 5). The rate of anxiety (85% vs. 47%) and depression (29.8% vs. 19.2%) were significantly higher among those who searched social media and the internet to get information about their problems ($P < 0.0001$ and 0.007, respectively, Figure 6).

Disease Associations

The most common concomitant GI disorders were gastroesophageal reflux disease, dyspepsia, and inflammatory bowel disease (overall 29.2%), and 30.8% of the participants had a history of other chronic disorders such as hypertension (12%) and diabetes mellitus (10%). Among our cohort, 37.7% had a history of medicine consumption (proton pump inhibitors and non-steroidal anti-inflammatory drugs as the most commonly used), 29.2% had a history of hospital stay, and 24.9% had experienced surgery. An important note is that 34.3% of the participants had first-degree relatives with a history of chronic GI disorders, and 9.4% had a history of GI malignancy in their first-degree relatives.

DISCUSSION

IBS is a multi-factorial condition with different aspects and its presentation could be affected by multiple psychosocial and environmental factors, including not only the level of education, socioeconomic condition, familial and emotional relations, and economic stability, but also geographic location, and climate and political issues.¹⁴⁻¹⁹ Environmental temperature and gut microbial composition have profound impacts on the digestive performance, and subsequently the diversity, composition, and function of gut microbial communities themselves are influenced by temperature.^{20,21}

In this international study, different patterns and relative prevalence of IBS subtypes were compared between subtropical and temperate regions and patients with different races and nationalities (Figures 2 and 3). While the average age of the patients with IBS at the first presentation was the same in both climates, the relative prevalence of diarrhea dominant IBS (IBS-D) was significantly higher in temperate regions²²⁻²⁴

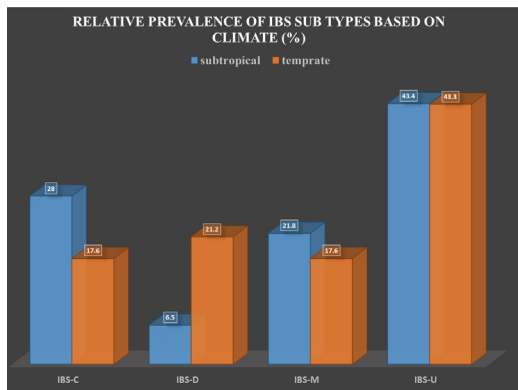


Fig. 4: Relative prevalence of IBS subtypes based on climate (IBS-c: constipation dominant; IBS-D: diarrhea dominant; IBS-M: mixed pattern; IBS-U: unclassified).

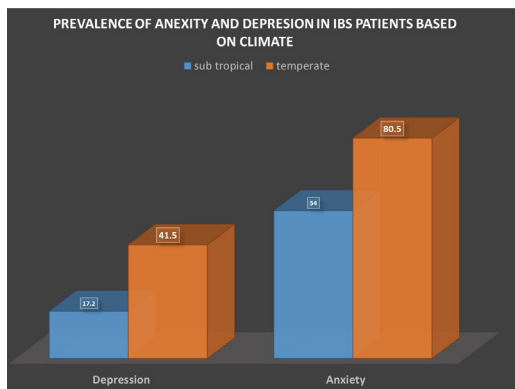


Fig. 5: Prevalence of depression and anxiety among residents of temperate areas in comparison with subtropical regions.

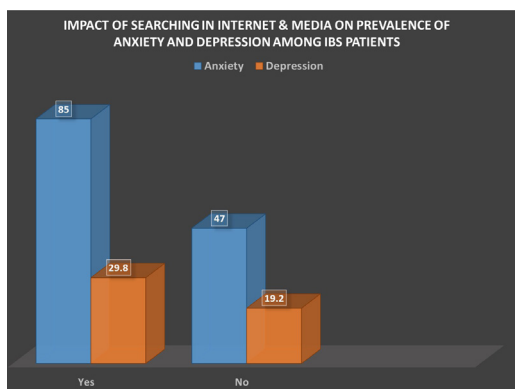


Fig. 6: Prevalence of anxiety and depression among those who searched social media and the internet.

in comparison with sub-tropical areas (22.1% vs. 6.8%, $P < 0.001$, Figure 4). This difference could be related to the effect of environmental factors such as temperature, oxygen concentration, moisture content, hydrodynamic effects, and microbial interactions on

biofilm formation and bacterial growth or even dietary habits.²⁵⁻²⁷ On the other hand, it could be presumed as post-infectious IBS that commonly presents as a diarrhea-predominant subtype and occurs in up to 10%-30% of individuals after acute gastroenteritis.²⁸

When interpreting the relative prevalence of IBS subtypes based on geographic regions and climate, our findings of the prevalence in temperate areas were in concordance with the data presented in an interesting meta-analysis by Lovell and Ford, who reported that IBS-D was the most prevalent subtype (40.0%),²⁹ but the data of subtropical regions were not in agreement with the current study and were compatible with another study by Hassanzadeh Keshteli and colleagues,³⁰ who reported IBS-C to be more prevalent. These differences in the relative prevalence of IBS subtypes notify that we should further consider the impact of climate and geographical environment in our epidemiological studies and do not globalize the results of regional surveys. To the best of our knowledge, this is the first Middle Eastern study of its kind focusing on populations in this very wide area with its two aspects of weather; temperate and subtropical. It seems that populations in this region are not identical in their IBS prevalence patterns following climate change.

When the prevalence of individual countries in the regions was analyzed, it was obvious that different prevalence rates were reported following three important variables. First, the definition criteria for IBS as Manning or Rome criteria and even among Rome, which criteria have been applied. Second, which communities and regions were surveyed; rural versus urban and hot versus temperate etc. Third, the subgroups of individuals who included. In a country like Saudi Arabia, the prevalence rates among different subgroups of individuals in different regions with different definition criteria ranged between 8.9% to 40.7%.³¹ The data from Egypt is, however, reported,³² and among medical students, the prevalence was 31.7%.³³

Besides abdominal pain, the most common complaint was bloating, which is compatible with studies by Ringel et al³⁴ and Jiang et al,³⁵ and further emphasizes the importance of this clinical symptom and its impact on the quality of life.^{36,37} Abdominal bloating has a great impact on the daily lives of subjects

diagnosed with IBS.^{38,39} Although the sensation of bloating may be related to enhanced sensitivity to visceral afferent stimulation, abdominal distension in more severely affected patients may be related to the triggering of a visceromotor reflex affecting the tone of abdominal wall muscles.³⁶ Based on the prevalence and importance of bloating, it is postulated that in the future, a separate sub-group will pertain to bloating dominant IBS patients.⁴⁰⁻⁴³

Another finding of the current study is the high prevalence of anxiety (85% vs. 47%) and depression (29.8% vs. 19.2%) among those IBS patients who searched the internet and social media to get information about their medical problems ($P < 0.0001$ and 0.007 , respectively). Currently, people often turn to search engines to learn about serious or highly stigmatic conditions. A surprising amount of sensitive health information is also sought and shared via social media.⁴⁴ Especially youths are significantly more likely to disclose personal health issues with peers online and hold the highest level of trust towards health-related information on social media.⁴⁵ A significant proportion of social media users reported that health-related information received on this platform influenced decisions regarding their family's health care, and decisions regarding family health care were more likely to be influenced when they used two or three types of platforms.⁴⁶ Several studies have shown that health information on the internet is of variable quality.^{47,48} Silberg and colleagues concluded that medical information on the internet contains too much incomplete, misleading, and inaccurate information, which could result in harmful effects for both patients and healthcare professionals who fail to use the internet properly.⁴⁹ These reports are in concordance with the findings of the current study. In the absence of a global standard and policy on control of the quality of presented medical information for the public, health education in the digital era needs to be accurate, evidence-based, and regulated.

CONCLUSION

Although the average age of IBS presentation is the same in subtropical and temperate areas, it seems that in temperate areas, the rate of IBS-D is more prevalent than in subtropical regions because the climate is more suitable for microorganisms growth. It seems that the

rates of anxiety and depression are significantly higher among patients with IBS who search social media and the internet to get information about their problems.

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ETHICAL APPROVAL

This study was performed in accordance with the Declaration of Helsinki, Good Clinical Practice, and applicable regulatory requirements. Written informed consent was obtained from all patients after an explanation of the research idea.

CONFLICT OF INTEREST

The authors declare no conflict of interest related to this work.

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