

Search Popularity of Common Gastrointestinal Symptoms; an Infodemiological Study

Ortak Gastrointestinal Belirtilerin Arama Popülaritesi; İnfodemiyojik Çalışma

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ÖZET

AMAÇ: Gastrointestinal sistemin fonksiyonel bozuklukları toplumda oldukça yaygın görülmektedir. İçinde bulunduğumuz bilgi çağında; semptomların internette aratılması özellikle gençler arasında yaygındır. Mevcut çalışma yaygın gastrointestinal semptomlara ait Google search istatistiklerinin değerlendirilmesini amaçlamaktadır.

GEREÇ VE YÖNTEM: Bu infodemiyojik çalışma Google Trends verisi kullanılarak yapılmıştır.

Bulgular: İshal ve kabızlık kelimelerinin aratılma hacimleri mevsimsel özellikler göstermektedir. İshal terimi yaz aylarında daha çok aratılmaktayken diğer gastrointestinal semptomlar mevsimsel özellikler göstermemekteydi.

BULGULAR: İshal ve kabızlık kelimelerinin aratılma hacimleri mevsimsel özellikler göstermektedir. İshal terimi yaz aylarında daha çok aratılmaktayken diğer gastrointestinal semptomlar mevsimsel özellikler göstermemekteydi.

SONUÇ: Google Trends verisinin yaz aylarında görülen viral gastroenteritlerle ilişkili olduğu görülmüştür. Aratılma hacimleri bazı hastalıkların mevsimsel özelliklerini inceleme alternatif bir yöntem olarak kullanılabilir.

Anahtar Kelimeler: kabızlık, İsha,; Google Trends

ABSTRACT

OBJECTIVE: Functional disorders of the gastrointestinal system are very common in the general population. In the digital era, the search for information about their disorders is very popular, especially in the young population. The current study aimed to evaluate the Google search statistics of common gastrointestinal symptoms.

MATERIALS AND METHODS: This infodemiological study was performed using Google Trends data; which simply gives the search popularity of a given search term according to the given period and region.

RESULTS: Related search volumes for the terms constipation and diarrhea showed seasonal variations. Related search volume for diarrhea was detected to be higher in the summertime. Whereas, other gastrointestinal symptoms showed no seasonal variations.

CONCLUSION: Seasonal viral gastroenteritis outbreaks show a correlation with the Google Trends data. Related search volumes can be an alternative way to show the seasonality of other disorders.

Keywords: constipation, diarrhea, Google Trends

INTRODUCTION

Functional disorders of the Gastrointestinal System (GI) are very common in the western population (1, 2). With differences in the perception of the symptoms, it may affect up to 30% of the general population. The most common symptom seen is constipation, followed by indigestion, bloating, abdominal pain, and diarrhea.

With developments in the digital era, the way of having information about diseases has changed (3). In Turkey, searching for information about their diseases is very common, especially in the young population (4). Every day billions of searches are made on Google. Google Inc. shares

search information and trends with the public via Goggle Trends. Google Trends is free to use and provides information about the search terms with the date and geographical information.

Several studies are using Google Trends data (5, 6). Those kinds of studies are called infodemiological studies and they may provide uncommon relations between the disorders (7). Seasonal variations in some disorders such as hypothyroidism and heartburn are shown.

This study aims to evaluate seasonal variances in a google search of common GI symptoms in Turkey.

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MATERIAL & METHODS

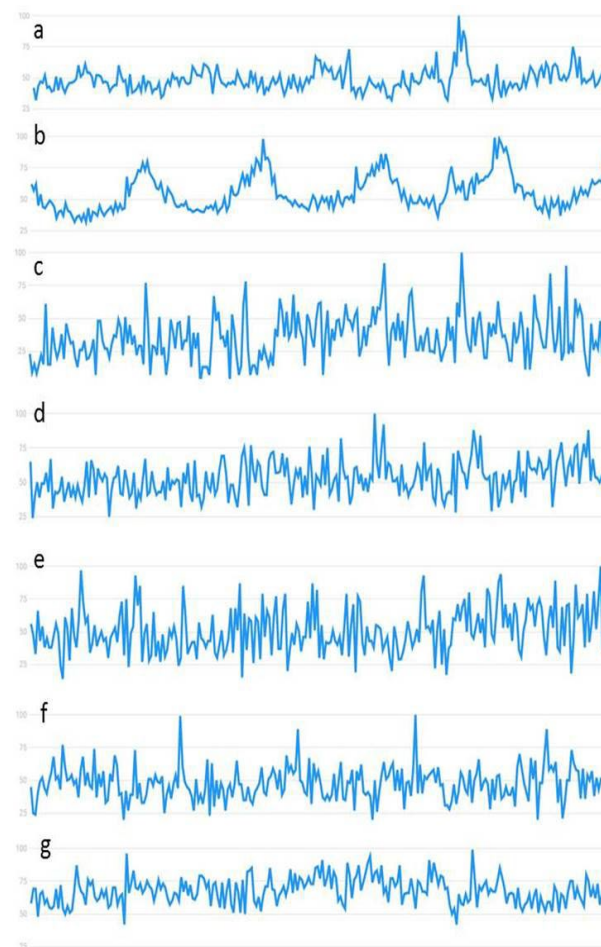
This infodemiological study was performed by using Google Trends data. Google Trends does not provide an exact search number. It provides Related Search volume (RSV) on a scale ranging from 0 to 100. This scale is calculated and normalized with the percentage related to the highest search volume in a given period. Google Trends data was obtained on 1st September 2021. The last five years' data from September 2016 to August 2021 were obtained. Search terms used were constipation (kabızlık), diarrhea (ishal), bloating (şişkinlik), indigestion (hazımsızlık), irritable bowel syndrome (irritable barsak sendromu and huzursuz barsak), hemorrhoidal disease (hemoroid, basur) and fatigue (halsizlik, yorgunluk). In an evaluation of seasonal variances, seasons were defined as spring (March, April, and May), summer (June, July, and August), autumn (September, October, and November), and winter (December, January, and February).

IBM SPSS 22 software was used for statistical analysis. Ranges obtained from Google Trends were compared by the Kruskal-Wallis test. A post hoc analysis was performed; Games Howell test was used. The level of statistical significance was accepted as 0.05.

RESULTS

Five years of related search volumes obtained from Google Trends are seen in Figure 1. Seasonal variations were detected in constipation and diarrhea (Table 1). However, there were no seasonal variances detected in other common symptoms. Seasonal variances of the symptoms are seen in Figure 2.

Figure 1. Related Search Volumes of the symptoms from September 2016 to August 2021



a. Constipation, b. diarrhea, c. indigestion, c. bloating, d. fatigue, e. irritable bowel syndrome, f. hemorrhoidal disease

In a post hoc analysis; RSV for constipation was significantly higher in autumn (September, October, and November) compared to all other seasons (Table 2). Besides, RSV for diarrhea was highest in summer (June, July, and August), compares to all other seasons.

Table 1. Seasonal distribution of relative search volume for common search terms

Search term	Spring		Summer		Autumn		Winter		P
	median	IQ range	median	IQ range	median	IQ range	median	IQ range	
Constipation	51	12.25	47.2	4.55	42.5	4.25	50.7	8.75	0.001
Hemorrhoidal disease	65.6	8.75	72	10.6	68	10.5	69.6	6.5	0.261
Diarrhea	44.5	9.6	60.2	15.9	48.6	15	39.7	5.15	0.001
Bloating	56	10.2	59.6	13.5	53	10.8	53.75	13	0.216
Indigestion	41.5	16.4	37.5	11.6	35.2	8.8	38.2	12.8	0.093
Fatigue	51.2	14.2	49.7	20.4	43	7.5	46.4	16.7	0.126
Irritable Bowel Syndrome	28.6	24	32.2	17	27.5	14.1	29.5	15.4	0.787

IQ:

Figure 2. Graphic showing the seasonal changes in the relative search volume of the symptoms

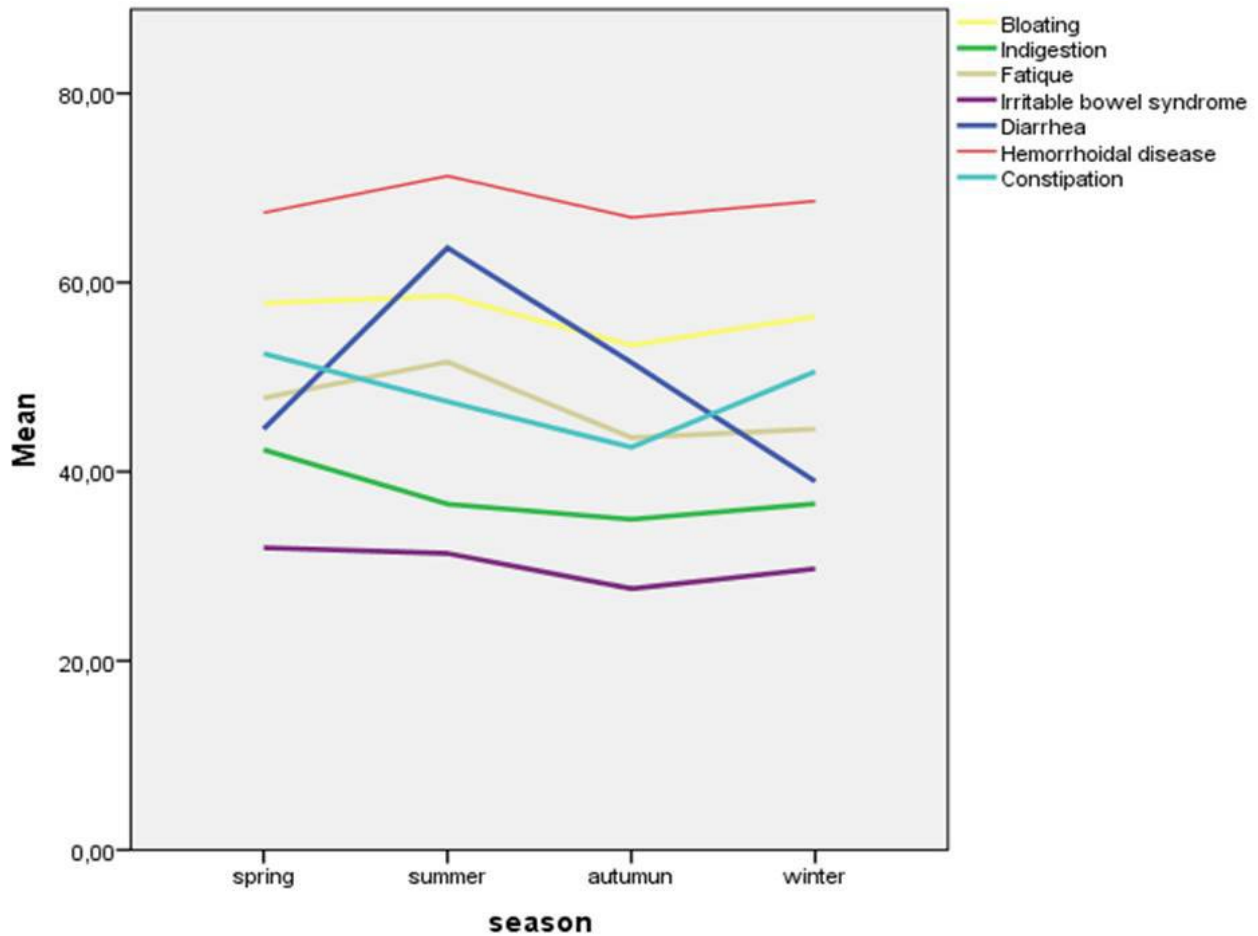


Table 2. Post hoc comparison of relative search volumes for “constipation” and “diarrhea”

	n	Average rank	Different from factor (p<0.05)
Constipation			
Spring (1)	15	51	3
Summer (2)	15	47.2	3
Autumn (3)	15	42.5	1, 2, 4
Winter (4)	15	50.7	3
Diarrhea			
Spring (1)	15	44.5	2
Summer (2)	15	60.2	1, 3, 4
Autumn (3)	15	48.6	2, 4
Winter (4)	15	39.7	2, 3

Kruskal-Wallis test statistic (K-W) = 24.551, p < 0.001 for “constipation”, K-W = 34.993, p = 0.031 for “diarrhea”

DISCUSSION

Like other infodemiological studies, our study is based on the behavior of seeking information about the diseases (8). The current study revealed seasonal differences in search terms “constipation” and “diarrhea”. However, other search terms for common GI symptoms did not reveal any seasonal variances.

Flanagan et al published the first article about irritable bowel syndrome search trends around the world (9). They

have reported increased search popularity in irritable bowel syndrome, however; they did not evaluate seasonal variability of the search popularity. Our study is the first study evaluating the seasonal variances in the search volume of common GI symptoms.

Previously the correlation of national prevalence of the influenza outbreak showed correlation with the google trends data (10). In the current study search volume for diarrhea was higher in summer. The reason for this high

search rate can be local outbreaks of viral gastroenteritis like rotavirus.

The main limitation of the current study is not being an epidemiological study. It is based on the public's internet search behavior of symptoms. Moreover, internet use may change according to age groups. In Turkey internet use and search for disease, symptoms are more common in the younger population (4). According to data from the Turkish Statistical Institute 79% of the Turkish population have internet access. Although, the study may not reflect the real symptomatology; it reflects the data collected from 79% of the Turkish population.

In conclusion population's search interests can be important data for the identification of the seasonality of some disorders. Common symptoms of the GI system showed no seasonality, however, diarrhea as a component of a chronic condition or as acute gastroenteritis showed peak search trends in summer.

Etik: Bu çalışmanın etik kurul onayına gerek yoktur.

Ethics committee approval is not required for this study.

Yazar katkı durumu; Çalışmanın konsepti; BS, ND, ET, dizaynı; BS, ND, ET, Literatür taraması; BS, ND, ET, verilerin toplanması ve işlenmesi; BS, ND, ET, istatistik; BS, ND, ET, yazım aşaması; BS, ND, ET,

Author contribution status; The concept of the study; BS, ND, ET, design; BS, ND, ET, literature review; BS, ND, ET, collecting and processing data; BS, ND, ET, statistics; BS, ND, ET, writing phase; BS, ND, ET,

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