

Sources of medical information of patients referred to colorectal surgery outpatient clinic for hemorrhoidal disease

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Abstract

Background: We surveyed patients with hemorrhoids about their behavior regarding searching for information about that disease and confronted it with data obtained from Google Trends website and Google searches. We aimed to determine sources of information on hemorrhoids used by patients. Secondary aim was to assess the quality of information provided by Internet in particular. **Materials and methods:** We collected 78 surveys from patients of the outpatient surgical clinic at Medical University of Gdańsk, in which we asked about sources of information about hemorrhoids. We used Google Trends to analyze most often used search queries associated with that topic. In result, we analyzed the content of top 10 Google search results of that queries in order to verify reliability. **Results:** Over 80% of surveyed patients looked for information about that disease online, 50% of whom were satisfied with the quality of information obtained. Our Google Trends analysis showed that term hemorrhoids has overwhelming prevalence in comparison to remaining terms. Analysis of top 10 Google search results showed that 7 in 10 organic links lead to websites with professional information about hemorrhoids. **Conclusions:** Patients use the Internet as a source of knowledge about hemorrhoids and find it satisfactory. Moreover, our research indicates that this information is reliable.

Keywords: hemorrhoids • Internet/Patient Preference • Google Trends • search engine

Citation

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Introduction

Nowadays, patients' self-consciousness is rising with World Wide Web as one of the most important sources of medical knowledge [1]. It is caused both by the growing amount of medical content in the Internet and by the growing percentage of population with Internet access [2-3]. Besides medical literature, newspapers and pamphlets, patients often choose the Internet which seems to be more accessible source of information about bothersome symptoms than a visit in physician's office. While self-diagnosing techniques (e.g. self palpation of the perianal area or self examination per rectum) which are explained on the Internet may seem sufficient in some cases, hemorrhoids should be diagnosed by a medical practitioner. Hemorrhoidal disease should be diagnosed after detailed history-taking and an accurate physical examination, including *per rectum* examination [4]. Moreover, internal hemorrhoids, which do not prolapse, can only be diagnosed by physician [5].

In this study we aim to determine sources of information on hemorrhoids used by patients. Secondary aim of the study is to assess the quality of information provided by Internet in particular.

Materials and methods

Study concept

We hypothesized that patients often search for information about hemorrhoidal disease independently and that Internet may be an important source of this information. Therefore, we designed this study in three-stage manner. As a first step we collected from patients surveys on hemorrhoidal disease. As a second step, based on the information gathered from surveys, we conducted a Google Trends analysis. In the final step we analyzed information on the patients' search behavior and assessed the quality of information they found in the Internet.

Survey

We collected 78 surveys from 78 patients of the outpatient surgical clinic at the Medical University of Gdańsk. The survey was anonymous and voluntary. Only the patients referred from general practitioner with either a suspicion or diagnosis of hemorrhoids were asked to complete the survey. Survey established following information: respondents' demographics, availability of an Internet connection, cause of the visit, presence or suspicion of hemorrhoids, source of

knowledge about symptoms and treatment, reliability of that information and information about self-medication. Statistical calculations were made with Statistica 12 software (2014, Stat Soft, Inc., Tulsa, USA).

Google Trends

On 14.09.2018 we queried Google Trends and downloaded the data for the following search input ["hemorrhoids"+"anal varices"+"anal bleeding"] [original polish queries: "hemoroidy"+"żylaki odbytu"+"krawawienie z odbytu"] Based on methodology suggested by Nuti et al [6]. Although hemorrhoids and anal varices are synonymous but rather two different diagnoses, we chose to include them in the search query as in common language they are often used interchangeably by mistake [7]. We searched within Poland from January 1st 2006 to September 1st 2018. All query categories were used. We narrowed regional interest to Poland, because of language specificity of the query.

Upon initial Google Trends search we narrowed the queried terms to "hemorrhoids" because it was the most often used term according to Google Trends in comparison to remaining terms (79 vs 6 vs 6 respectively).

Results in Google Trends are shown in a relative manner. Numerical data values represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. Popularity is measured in comparison to all of Google searches in specified time and location. A value of 50 means that the term is half as popular. Likewise, a score of 0 means the term was <1% as popular as the peak results [8].

Internet reliability

Based on the previously determined search term we conducted a Google search and analyzed results from the first page and screened professional or non-professional websites. Each link was categorized into: organic (if it was an organic Google search result) or advertisement (if it was part of the Google Ad Words campaign); professional (if it was authored by a Medical Doctor (MD) or based on medical literature) or non-professional (drug company website, health-promoting website, outpatient clinic website or an open encyclopedia).

The first page of search results represents over 90% of the traffic and thus second and further pages weren't included into the study [9]. We chose not to assess data from either MSN or Yahoo! due to Google's overwhelming market-share in Poland [10]. On 21.08.2018 and 28.08.2018 two researchers with medical background performed 2 separate series of searches for the term "hemorrhoids" using Google

Chrome, Firefox, Opera, Google Chrome Mobile, Safari Mobile web browsers. All searches were done in "incognito mode" to exclude any interference from cached files. Four most popular Google Ad Words results were chosen to be included into the study.

Survey

Abbreviated results are presented in Table 1. Full results are available in Appendix 1. Median age of participants was 47 years. Definite majority of respondents were female, university-educated and living in urban areas. Almost 9 out of 10 patients had Internet access. Most common causes for referral to the colorectal surgery outpatient clinic were: suspicion of hemorrhoids (53.8%) and diagnosed hemorrhoids (28.2%). Most patients (73.1%) diagnosed themselves, while physician diagnosing remaining 26.9% was either GP or a specialist. Less than 1 in 4 patients were ever examined per rectum.

Majority of patients (80.8%) undertook Internet search regarding hemorrhoidal disease and half of them were satisfied with the results. Among most common sources of knowledge on the diseases and their treatment (% respectively) were: physicians (44.9%; 53.8%) and the Internet (44.9%; 32.1%). Over half of the respondents self-medicated, most often with suppositories (46.2%) and creams or ointments (44.9%). Almost 1/3 changed their diet. In over 7 of 10 of cases those efforts were at least partially successful.

Personal computer was the most common device used to access the Internet (74.4%) while mobile devices placed second (27%). Scientific associations' WebPages, scientific journals' WebPages and National Health Fund (NFZ) webpage were generally found to be trustworthy while Internet forums, popular media, pharmaceutical companies' WebPages and WebPages for patients were not. Only 1 in 5 respondents chose to attach suggestions regarding improvement of the available information. The most frequently mentioned ideas were: the physician should collect a more detailed patient history (25%), pamphlets in outpatient clinics (19%), creating a dedicated medical web service (19%) and easier access to specialists (41%).

Table 1. Abbreviated results of the survey

Did you look for information about hemorrhoids?		
	n = 78	%
Yes	63	80.8%
No	13	16.6%
Not answered	2	2.6%
Were you satisfied with the information you obtained?		
	n = 78	%
Yes	40	51.3%
No	30	38.4%
Not answered	8	10.3%

What was your source of information about symptoms of hemorrhoid disease? (multiple choice question)		
	n = 78	%
Physician	35	44.9%
Newspapers	30	38.5%
Pamphlets	25	32.1%
Internet	35	44.9%
How many sources of information about symptoms did you use?		
	n = 78	%
One	23	29.5%
More than one	55	70.5%

Was this information helpful?		
	n = 78	%
Yes	67	85.9%
No	6	7.7%
Not answered	5	6.4%
Have you tried self-treatment?		
	n = 78	%
Yes	42	53.9%
No	27	34.6%
Not answered	9	11.5%
Was the treatment successful?		
	n = 78	%
Yes	22	28.2%
Partially	34	43.6%
No	9	11.5%
Not answered	13	16.7%
What type of treatment have you used? (multiple choice question)		
	n = 78	%
Diet	25	32.1%
Hygiene	16	20.5%
Ointments and creams	35	44.9%
Suppositories	36	46.2%
Tablets	10	12.8%
How many types of treatment did you use?		
	n = 78	%
One	30	38.5%
More than one	35	44.9%
Not answered	13	16.6%

Appendix for table 1. Abbreviated results of the survey

Do you have access to the Internet?			
		n = 78	%
At home, tablet, smartphone		68	87.1%
At friend's or family's home		0	0.0%
Other		2	2.6%
No		7	9.0%
Not answered		1	1.3%
What is the cause for your visit?			
		n = 78	%
Suspicion of hemorrhoids		42	53.8%
Confirmed hemorrhoids		22	28.2%
Else		10	12.8%
Not answered		4	5.2%
Did your GP performed a per rectum examination?			
		n = 78	%
Yes	26.3% (n=19)	5	6.4%
No	73.7% (n=19)	14	18%
Not answered		59	75.6%
Did you look for information about hemorrhoids?			
		n = 78	%
Yes		63	80.8%
No		13	16.6%
Not answered		2	2.6%

Appendix for table 1. Abbreviated results of the survey

What kind of device did you use to access information about symptoms of hemorrhoid disease? (multiple choice question)		
	n = 78	%
Personal computer	58	74.4%
Tablet	8	10.3%
Smartphone	13	16.7%
TV	9	11.5%

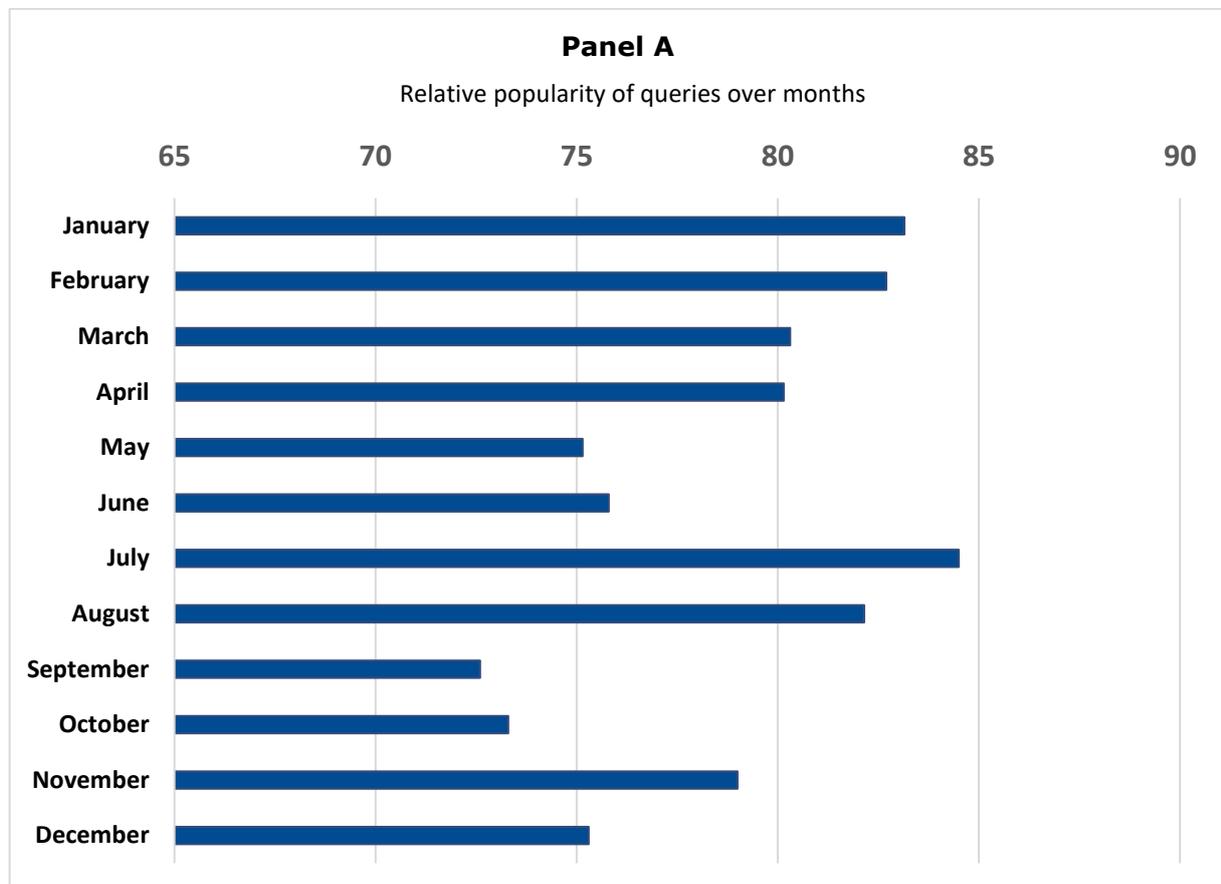
Google trends

Changes in the amount of search queries over last 12 years were observed with median at 82 and minimal interest at 54 (maximal at 100 - as a result of calculation method). However there is a visible yearly pattern with lowest interest before and after holidays and during Christmas (respectively in May, June, September, October and December (75.2; 75.8; 72.6; 73.3; 75.3)) and highest during holidays and after Christmas (respectively January, February, July and August (83.2; 82.7; 83,4; 82.4)). (Graph 1, Panel B)

Variation in the amount of search queries across geographical location was observed with the lowest interest in Lodzkie and Zachodniopomorskie (87) voivodships and highest in Opolskie, Podlaskie, Swietokrzyskie and Lubuskie voivodships (100).

Internet reliability

First page of Google results for search term “hemorrhoids” was analyzed. Each contained 10 organic links and varying amount (from 1 to 4) of Ad Words



Graph 1: Panel A. Relative popularity of queries over the months of the year 2006-2018

advertisement links [11]. Ad Words is a Google Inc. advertisement campaign tool which allows vendors to advertise their products and services in text-based search ads. Content of the displayed ads depends on searched terms, cached files and other factors [12]. Below we present results from analysis of links provided by the first page of Google search results. One hundred and twenty-one links were analyzed of which 21 were advertisements and 100 were organic. Only those ads that were displayed in at least 2 separate searches were included.

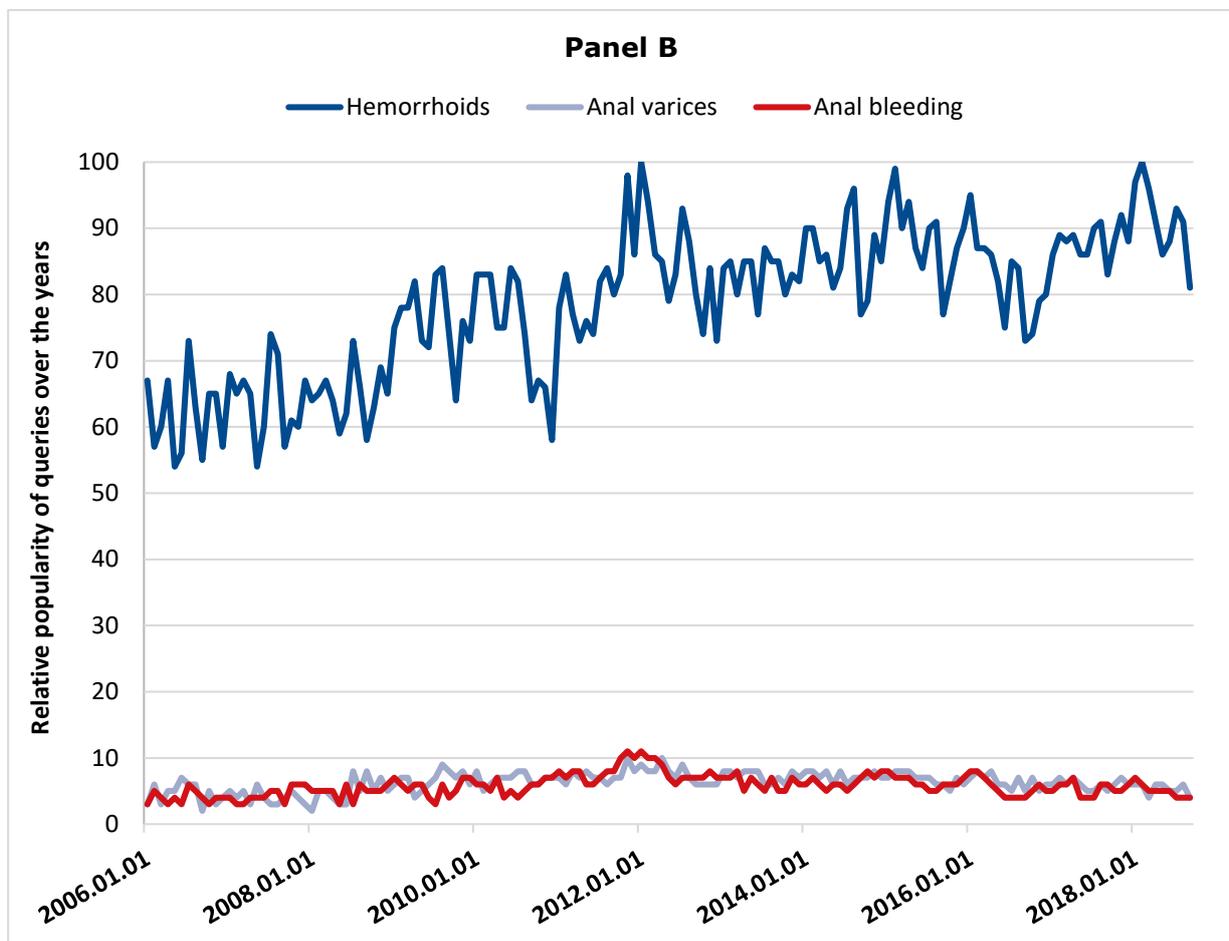
Total of 21 Ad Words ads linked to 4 websites of which 3 were non-professional and provided by drug companies, whereas 1 was categorized as professional (provided by a private practice outpatient clinic and authored by a MD).

Every analyzed Google search page contained the same 10 organic links of which 3 were non-professional and 7 were professional. Two out of three of the non-professional websites were provided by drug companies and presented modes of treatment and remaining one was a health-promoting website however it lacked literature sources or authorship information. Of the 7 websites classified as professional, 1 was an

encyclopedia (therefore based on medical literature) and the remaining 6 were health-promotion websites (1 based on literature, the rest were authored by MD). Results with links to analyzed websites are in Table 2.

Discussion

Over 80% of the patients referred to our surgical outpatient clinic previously looked for information about hemorrhoids, thus showing a great demand for knowledge among them. Moreover, 73% of patients stated that they performed a self-diagnosis of hemorrhoids. In our group, Internet was used as often as professional advice to research the topic of hemorrhoids and overall percentage of patients that used Internet was 45% and similar to the findings of Diaz et al [13]. In contrast, over 87% (1016/1162) of the patients analyzed by Wong et al used the Internet to find health information. The most common sought topic was symptom 81.59% (829/1016) and the most common reason for choosing Internet was convenience 55.41% (563/1016) [14].



Graph 1: Panel B. Relative popularity of queries over the years (cumulated data from years 2006-2018)

Table 2. Complete results of the internet reliability analysis

Lp	Links in order of search results	Category	Authorship	Organic/Ad	Type of website
1	http://jmalys.pl/hemoroidy.html	Professional	MD	ad	outpatient clinic
2	http://www.criorectum.pl	Non-professional	lack of data	ad	drug company
3	http://procto-hemolan.pl	Non-professional	lack of data	ad	drug company
4	http://www.fine6.pl	Non-professional	lack of data	ad	drug company
5	http://www.poradnikzdrowie.pl	Professional	MD	organic	health website
6	http://www.poradnikzdrowie.pl	Professional	MD	organic	health website
7	http://www.medonet.pl	Non-professional	lack of data	organic	health website
8	http://wylecz.to	Professional	MD	organic	health website
9	http://proctohemolan.pl	Non-professional	lack of data	organic	drug company
10	https://pl.wikipedia.org	Professional	based on literature	organic	encyclopedia
11	http://www.criorectum.pl	Non-professional	lack of data	organic	drug company
12	https://portal.abczdrowie.pl	Professional	based on literature	organic	health website
13	http://gastrologia.mp.pl	Professional	MD	organic	health website
14	http://lubikowski.pl	Professional	MD	organic	health website

Medical professionals often have to struggle against their patients' misinformation. While it is a common belief that information that can be found on the Web is of low quality, our research shows that it is not necessarily true. Majority of the analyzed websites are authored by MDs or are based on medical literature, and are easy to understand. That may explain why as many as 63% of patients that researched hemorrhoids were satisfied with the information they

obtained. On the other hand, quality of the information on the Web concerning different colon diseases is not always satisfactory. Yeung et al showed that out of 200 websites about surgery for diverticular disease only 60 (30%) provided patient-oriented information. Despite the fact that, symptoms, complications, investigations and treatment options were thoroughly described, only 22 (36.7%) of the websites were found as information relevant [15]. In addition, analyzing 100

sites about surgical treatment for Crohn's disease only half of them provided details on treatment options and only one was recognized as informative [16].

Our study has some potential limitations. We observed a much higher percentage of women in our patient group what is not explained by published epidemiology of hemorrhoidal disease this however may be a random occurrence [17]. Moreover, our data may be biased due to the fact that surveys were collected in a specialized surgical outpatient clinic. Localization of our clinic in a large city may have influenced the demographics of our study group. The mechanisms of Google search engine may be another limitation. While organic links are presented in the same order for every user due to SEO (Search Engine Optimization), Ad Words are specific for every internet user's location, search patterns and cached files. That is why every search is unique to the user and cannot be fully reproduced. In addition, we expect that some of our participants may have used advertisement blocking tools which prevent

many ads from appearing on their screens, thus making the searches completely different.

Conclusions

We would like to underline the fact that Internet is a source of medical information which patients prefer and consider as important. Additionally, the knowledge available on the Internet is freely accessible and of good quality. Both doctors and public campaigns should consider patients' preferences in obtaining medical knowledge and point them to quality sources.

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