The impact of online information on health-related decisions – a review of findings

Monika Wójta-Kempa
Department of Humanities and Social Science, Division of Health Humanities and Social Science, Wrocław Medical University, Poland
E-mail address: monika.wojta-kempa@umw.edu.pl
ORCID: https://orcid.org/0000-0002-0027-1033

Andrzej Jarynowski
Interdisciplinary Research Institute in Głogów, Poland
Institute of Veterinary Biometry and Epidemiology, Free University of Berlin, Germany
E-mail address: ajarynowski@interdisciplinary-research.eu
ORCID: https://orcid.org/0000-0003-0949-6674

Abstract

The amount of medical knowledge on the Internet is growing systematically. There are more and more professional platforms and quasi-professional health portals, personal blogs of individuals experiencing illness (pathographies), and other broadcasters who introduce both truthful and false information into circulation. The enormous volume of information, often featuring contradictory opinions, can lead to confusion and a loss of trust in medical professionals and conventional medicine. The existence of various professional and non-professional, educational and commercial "circles" of medical knowledge fosters a deprofessionalisationu of medicine, which facilitates the spread of false and harmful medical myths. Online content can affect the health-related decisions users make.

In this article, we present the outcomes of review of data from research on the influence of online health information (OHI) on health decisions among the general population and in specific patient groups. We describe the diversity of OHI across various online platforms and outline the main subpopulations of users. We also briefly discuss the methodology used to research the influence of OHI on medical decisions.

Research findings show that the strength of the impact of online-acquired information on medical decisions ranges from 11% to 80% of the population examined, with most studies placing it between 30% and 60% (Thapa et al., 2021). One differentiating factor in the strength of OHI's influence on medical decisions was the type of decision (e.g., choice of treatment method), the health literacy level of study participants, as well as decisions about self-care and self-medication. This paper offers a typology of OHI functions in the cognitive, emotional, and behavioural dimensions of medical decisions. From a sociological perspective, the study of human behaviour in the health sphere raises questions about the ethics of online media and their responsibility for user health.

Keywords: Online Health Information (OHI), medical decision-making, deprofessionalization of medicine

Introcuction

There is no doubt today that the Internet has revolutionised the availability of medical knowledge and medical services. People experiencing anxiety about their own or their relatives' health— patients and those in distress—are increasingly using the Internet to search for online health information (OHI) regarding their health status. Seeking explanations for symptoms and their significance often precedes a face-to-face visit to a medical professional. Easily accessible, user- friendly content is a highly competitive source of information about health and possible courses of action in the face of health threats, especially when patients face difficulties accessing professional medical services. Meanwhile, patients already dealing with diagnosed illnesses create their "own" shared with other patients' virtual space for exchanging information, beliefs about the illness, assessments of medical staff (and their effectiveness), as well as experiences of the illness and mutual support. While practitioners of conventional medicine continue to represent a world of specialised, exclusive knowledge that is often not openly accessible, patients (and future patients) aim at "taming" the risk of potential or already diagnosed illness. Growing appreciation for health, along with the desire to maintain well-being in many areas of life—both personal and professional— creates a demand for information that "draws in" online materials. In this way, a process of medicine's deprofessionalisation takes place. Medical issues are no longer attributable for medical staff only - they belong to the patient and his/her social environment. During the COVID-19 pandemic, an "infodemic" further altered the role of existing (especially so-called "new") media, turning them even more into sources of strictly medical knowledge, as well as pseudomedical content, with alternative treatments experiencing surges in viewership. Thus, there is also information circulating that can negatively impact health.

Information found online is often the basis for making decisions, including consumer decisions. OHI can potentially shape attitudes and decisions concerning an undiagnosed or already diagnosed illness, the method or direction of treatment, and the choice of physician or medical facility. A patient's active approach to obtaining medical information via the Internet can reflect both a high sense of responsibility for one's own (or someone else's) health and fear (for example, fear of illness or treatment). On one hand, OHI may increase a patient's engagement in treatment; on the other hand, it can further fuel fear (e.g., of vaccination), reducing the willingness to seek information or cooperate with the doctor. From an economic standpoint, well-conducted online education can help reduce the number of (unnecessary) doctor visits, shorten visits, and improve doctor-patient communication. On the negative side, OHI may also erode trust in medical personnel. Considering how widespread this phenomenon is, it is

important to describe and monitor how online information influences the decisions of those facing health problems.

Purpose of the Article

The purpose of this article is to show the positive and negative consequences of searching for medical information online and to understand how such searches affect the decisions made by consumers of healthcare services. The article takes the form of a thematic review (a "scopus review"). Based on a review of the literature in databases such as MedLine, Scopus, and CEJSH, the authors aimed to present the most important findings and research trends in the area of how internet-sourced information affects health and treatment decisions.

The issue of the consequences of patient activity on the Internet is highly relevant. The abundance, fragmentation, and low quality of some OHI can lower health and e-health literacy (Suarez-Lledo & Alvarez-Galvez, 2021; Wong & Cheung, 2019) while, on the other hand, potentially increate patients' knowledge and skills (patient empowerment) (Bass et al., 2006; Pourrazavi et al., 2022). Increasingly, studies that monitor online behaviour use more in-depth analyses, for example, those concerning "filter bubbles" and how users search for information in line with their existing beliefs (the so-called "bias seeking") (Suzuki & Yamamoto, 2021). The health information patients find online significantly influences how frequently they use medical services, the choice of medical facility or a specific doctor (Bujnowska-Fedak & Węgierek, 2020), and strongly impacts relationships with medical professionals (Dong et al., 2022; Luo et al., 2022; Tan & Goonawardene, 2017). Decisions taken on the basis of online searches became widespread during the COVID-19 pandemic, when scant medical knowledge about the new virus and disease was insufficient for making decisions about whether to use mitigating measures or get vaccinated (An et al., 2021).

How to Measure the Influence of Internet-Sourced Information on Health Decisions?

A key methodological issue involves determining how to measure the impact of OHI on medical decisions. Existing systematic reviews on online behaviour (Jia et al., 2021) and on the influence of OHI on medical decisions (Thapa, 2020; Luo et al., 2022) indicate that researchers use several scales to measure how frequently OHI is sought, such as:

- The Problem Solving in Medicine Questionnaire (Chen et al., 2018)
- The Internet Health Information Quality questionnaire (Lu et al., 2018)
- The Trust in Online Health Information questionnaire (Sillence et al., 2019)
- MHISB - the mobile health information-seeking behaviour (MHISB) questionnaire in people with cancer (Zhang, 2023)

These scales show users' subjective evaluations of the quality and reliability of the information they find online. There are also proposals for theoretical models, such as the Planned Risk Information Seeking Model (PRISM), which identify the socio-psychological correlates of online information use and the intentions of those searching for such information (Link et al., 2021).

The impact of "processed" online information on health-related decisions is most frequently measured by self-assessment questionnaires addressing, for example, decisions about where to seek treatment, the method of treatment, deciding whether to schedule a (medical) consultation, the number of physician visits (including telemedicine consultations), compliance with medical recommendations, and changes in health behaviour (e.g., beginning a diet, physical activity, self- care). Among these measurement tools are also standardised scales, such as:

- the Online Health Information Utilisation questionnaire (Chen et al., 2018)
- the Morisky Medication Adherence Scale (Graffigna et al., 2017), measuring compliance with medical recommendations
- Well-being Health Changes (Mano, 2015)
- the Decision-Making Preference Scale of the Health Information Wants Questionnaire (Xie et al., 2013)

In a study by Bujnowska-Fedak of the Polish population, the authors used a custom set of diagnostic questions (Bujnowska-Fedak & Węgierek, 2020). Another approach involves employing analytical tools for monitoring Internet traffic and identifying those generating content in digital media— traditional (linear, sender-to-receiver) or social (feedback loops between sender and receiver)—as well as the affective dimension (various forms of likes or emotional tone in comments) and users' behavioural patterns (online interactions and content propagation).

Content available in apps dedicated to patients (e.g., those that provide personalised information based on individual patient data) can also influence medical decisions. The COVID-19 era additionally expanded research on how people respond to online information exposure and which medical decisions they make (e.g., spreading disinformation reduces the likelihood of getting vaccinated against COVID-19 (Betsch et al., 2010; Eitze et al., 2021)). Telemedicine solutions dedicated to specific diseases or health risks are appearing more frequently, helping patients follow through on previously made decisions. This supports a patient-centered care model.

Profile of Online Medical Knowledge Users (Poland)

In Poland, medical decisions are often preceded by information-seeking. Over three-quarters of adults (77%) go online at least once a week—9 percentage points more than before the COVID-19 pandemic (CBOS, 2022). Nearly 80% of Internet users (53% of the overall population) look for medical information

online. The Internet is used for contacting medical facilities (56% of Internet users, which is 38% of the general population) and purchasing medications, dietary supplements, medical accessories, or rehabilitation equipment (32% of Internet users) (CBOS, Healthcare Online, 2020).

More than half of Internet users (54%) visit health-related websites covering illnesses, treatments, medications, and dietary supplements. A small percentage (4%) do so regularly, one-quarter (25%) from time to time, and another 25% occasionally. Forty-six percent do not visit such sites at all, but that does not mean they never see this information—it may reach them indirectly through social networks (from "information gatherers" to "consumers," e.g., from women to other users: children, parents, partners). It is crucial whether these "information gatherers" can accurately interpret and apply what they read. Over one-fifth (22%) of Internet users take part in forums and groups related to health and medicine; a small minority among them (4%) post messages themselves instead of merely reading others' posts. Slightly less than one-fifth (17%) visit forums and groups discussing healthy lifestyles and nutrition, while somewhat fewer (14%) visit those devoted to health issues and diseases. Over the last four years, not only has interest in health-related forums and discussion groups increased by 7 percentage points among Internet users, but also those specifically addressing certain illnesses and health concerns (up by 4 points). One can anticipate that, along with rising health awareness, the new e-patient model, and the staffing shortages and systemic inconsistencies in healthcare services (including an unstructured telemedicine sector), this trend will continue growing.

Which topics are searched most frequently? Nearly two-thirds (67%) of Internet users experiencing some health issue look online for information about those symptoms or ailments. About one-fifth (19%) do so always or often, one-quarter (24%) do so sometimes, and another quarter (24%) do so rarely. More than a quarter (27%) ask questions on the Internet about their symptoms or ailments, and 5% do so often or always. One-fifth (21%) of Internet users say they set their own course of treatment using information found online and do not consult a doctor: 2% do this often, 6% occasionally, and 13% rarely. One in ten (11%) Internet users reported doing all three activities (CBOS, Healthcare Online, 2020).

Compared to a 2016 study, there has been no change in the overall scale of searching online for health problems—but more people now say they do so frequently when unwell. The number of people who self-prescribe a course of treatment using information they find online (and do not consult a doctor) has risen too. CBOS findings show a clear link between searching for health information online and making decisions based on it.

A significant portion of Poles use the Internet for health purposes, mostly to find information or opinions about doctors and medications, or to learn about their own health concerns. Less often— though much more so than four years ago—they use it to contact doctors or clinics and to buy medications. The increase in the popularity of online medical services and purchasing pharmaceutical items may be linked not only to growing digitalisation but also to the pandemic, which made it harder to access them in person. COVID-19 may also

have contributed to a rise in the number of people who go online to inquire about health complaints and who then self-treat based on the information they find, without consulting a doctor.

Women are notably more active than men regarding medical use of the Internet. Higher education levels, higher income, and residence in a large city are also significant factors in regularly using online health knowledge. Searching online for information about doctors and medications, contacting medical facilities, and purchasing drugs online are also more often declared by respondents who use non-reimbursed private medical services (CBOS, Healthcare Online, 2020).

When coping with health issues, women and younger users (25–34), better-educated individuals, those living in big cities, and those with the highest incomes use the Internet more frequently. This sociodemographic profile (women, under 35, incomes over 3,000 PLN per capita, large-city residents, using private healthcare services) currently characterises in Poland a person who, to a clearly greater extent than others, determines how to manage health problems based on online information and does not consult a doctor. We can assume these OHI users have high e-health literacy or believe they do. This pattern, along with posting questions about health problems online, is also more common among people who exhibit low trust in their physicians (CBOS, 2022).

Each type of online medium by definition targets a particular user profile and influences medical decisions differently. Health information published online (OHI) varies depending on the purpose and characteristics of each platform. Users of each medium have a distinctive (predominant) sociodemographic profile and specific information needs. Table 1 provides a brief overview of the types of medical information found on various Internet platforms. In Poland, the use of OHI increased notably during the COVID-19 pandemic, with approximately 80% of internet users seeking health-related information online (CBOS, 2020). Typical searches involve symptoms, treatment options, and healthcare facilities. Women, younger individuals, urban residents, and those with higher education and income levels are most active, frequently demonstrating higher autonomy in healthcare management, including self-medication and choosing medical providers (Bujnowska-Fedak & Węgierek, 2020). ~43% of adults used pacjent.gov.pl by 2023.

Table 1.
Characteristics of medical information found on different Internet platforms *(Jankowski & Gujski, 2022; Waszak & Kasprzycka-Waszak, 2018; Wawrzuta et al., 2022; Zoghlami Bellalouna & Saied Ben Rached, 2018)*

Medium	User population	Characteristics
Google (search engine)	>95% of Polish residents who can read in Polish	Often called "Dr. Google." After entering a query, users are redirected to thematic forums, encyclopedias, medical services, blogs, or more rarely to social media, sorted by algorithms such as PageRank. AI may now suggest answers directly, but the primary function is to show sites the user can visit.
Online medical encyclopedias and scholarly articles	Less than 10% population; overrepresented among students and people with higher education	For example, "Interna Szczeklika," Wikipedia, or Mayo Clinic D&C in English. These typically use language aimed at medical professionals and rarely address typical patient queries. No interaction available.
Specialist blogs	Fewer than 30% the population	Examples: PanTabletka, MamaPediatra. Accessible texts and multimedia in a first-person narrative with personal experiences. Sometimes contains factual errors (misinformation). Very limited opportunities for interaction.
Popular medical portals	About half of the population	Examples: Medonet.pl ~7.66M/mo, ABCzdrowie.pl ~7.26M/mo. Content is produced for consumers (clickbait). Interaction is minimal, limited to posting comments.
Non-medical portals	Over half of the population	Usually covers common diseases. Accessible texts and multimedia integrated with other topics, e.g., social issues. Some factual errors (misinformation). Interaction is mostly limited to posting comments.
Specialist forums	<10% of the population; overrepresented among individuals with higher education	Many case descriptions (a user can find a case similar to their own). Peer-to-peer interaction (horizontal medical education). To share opinions i.e. ZnanyLekarz. To seek peer support ForumGinekologiczne.pl ~370k/mo. Large quantity of factual errors, including deliberate attempts to mislead (mis- /disinformation).
Streaming platforms	Over half of the population	Primarily YouTube, though Netflix and other platforms increasingly address medical topics. I.e. Medonet channel. Video format is attractive – also shorts. Very limited interaction via comments. Large number of factual errors, sometimes deliberate (mis-/dis-/malinformation).
Facebook	half of the population	Discussions often have a strong emotional tone. Easy peer-to-peer interaction (horizontal medical education). Large number of factual errors of all types (mis-/dis-/malinformation).
Twitter/X, Instagram, TikTok, etc.	25% of the population, demographically diverse	Mainly short posts, graphics, or video clips. Easy peer-to-peer interaction (horizontal medical education). Large number of factual errors of all types (mis-/dis-/malinformation).

Psychosocial Factors in Receiving Online Health Information (OHI)

In the context of medical decisions, factors such as health literacy, information sensitivity, and the psychological and social profile of OHI users are particularly important.

Searchers, gatherers, and consumers of health information are three distinct categories of OHI users. In some cases, one person may fill all three roles, but in other situations, for example, one person (a parent or partner) may search for information regarding a child's or partner's illness, filter the information, and then share it through the social communication system. The ultimate consumer is the patient, who - for various reasons - may not be able or willing to search for information personally. Levels of involvement in actively seeking information differ (for example, women are more frequently involved), as do abilities to interpret and apply knowledge appropriately (e.g., what to do if the user finds reports of side effects from a therapy recommended by their doctor).

From the standpoint of public health, the primary challenge remains users' ability to verify (fact- check) the knowledge they acquire. This has a psychological dimension. Fear about one's own or others' health, for instance, is a strong motivator for both information seeking and for making certain medical decisions. Navigating the information space of social media can be frustrating and overwhelming due to the rapid rate and unregulated nature of how information is gathered, the contradictory nature of certain messages, and difficulties assessing credibility (e.g., challenges in detecting a sender's real motives). Intensive information seeking, or frequent forum participation, can lead to user fatigue or emotional overload (Ngien & Jiang, 2022), even addiction (Kobryn & Duplaga, 2021). Negative emotions tied to seeking information can heighten stress levels, causing users to drop out of social media entirely, thereby losing a potentially important source of social and informational support (Dai et al., 2020), including the inclination to verify the accuracy of what they've found. Jiang (2022) has shown that media fatigue clearly reduces a user's tendency to fact- check.

Since the Internet is an open space where anonymity is sometimes possible, it also creates a field for unethical practices. Inexperienced users may be misled by unreliable or unverified information and inadvertently harm themselves by making inappropriate medical decisions. The Internet (especially the darknet) allows the purchase of illegal medications or forbidden psychoactive substances. It also provides natural ground for social movements that question the safety of medical solutions or the ethics of the medical profession. At the same time, it is a repository of medical myths and disinformation, spreading stories of medical errors and iatrogenic harm, heightening public anxiety, and fueling a crisis of confidence in conventional medicine.

Recipients of online medical knowledge often report difficulty assessing the credibility of what they find. It can also be challenging to determine whether an author is a reliable expert, is unbiased, or is working on commission to promote specific paid services. They also report difficulties locating the information that's truly relevant for them. Sometimes users end up joining virtual "therapeutic

groups," where the group's moderators or participants—often with no medical education—curate and interpret information.

How do patients evaluate the credibility of information? Among cancer patients, the most popular approach is to compare content from multiple sources (71%), to discuss it with a doctor (56%), or to go directly to official sites run by scientists or government bodies (53%). Around 32% of patients found the OHI difficult to understand, but ultimately 91% considered it useful (Chang et al., 2020). Activity on social media, such as indiscriminately sharing superficial medical content, can lead to dangerous oversimplification or stereotyping of medical information, even cognitive and moral trivialisation (Baccarella et al., 2018). The work of Suzuki and Yamamoto (2021) shows that individuals with low health literacy and negative prior beliefs about medical intervention spend less time verifying and are more prone to selecting information that confirms their preconceptions (i.e., a "bias in web page selection"). Meanwhile, users with high health literacy devote more time to search and review websites that present contrasting opinions.

In the social realm of filtering medical information, important factors include health literacy, disease- related beliefs (stereotypes), the individual's available means to act, the functioning of family networks, and other conditions that influence the time spent searching for information, the user's cognitive capabilities, critical thinking skills, and vulnerability to persuasion. Among those who search for information, there are both "heavy users" who frequently and "fluently" gather information in areas they find important (a few percent of the population), and occasional users who check a small selection of well-known websites (not necessarily aligned with conventional medicine). Polish versions of scales measuring e-health literacy exist (e.g., Burzyńska et al., 2022).

In medical sociology, the lay referral system is a well-known construct that explains beliefs and decisions (Freidson, 1970). The social networks surrounding a patient filter medical knowledge even before the patient visits the doctor (or pharmacy). It is in these social networks that we find deprofessionalisation of knowledge (through blogs, patient support groups) and the influence of social networks on health-related decisions.

The willingness to seek and verify information grew especially during the COVID-19 pandemic. Many studies noted a huge interest in health information alongside difficulties in judging its credibility, for example, regarding vaccination (Dadaczynski et al., 2021; Gunasekeran et al., 2022).

Table 2 provides a condensed overview of user profiles that may emerge among Polish users of online medical information. The table outlines factors including level of interest in health, e-health literacy, susceptibility to information (i.e., how likely are they to adjust their views/decisions on the basis of new information), susceptibility to manipulation (vulnerability to misinformation, inability to assess credibility), and online activity (whether the user creates/transforms content or merely passively consumes or transmits it).

Table 2.
Selected user populations of OHI in Poland based on certain profile features *(Boguszewski et al., 2021; Bujnowska-Fedak et al., 2019; Burzyńska & Kruk, 2021; Ćwiklicki et al., 2022; Duplaga, 2019, 2020, 2022; Duplaga & Grysztar, 2022; Duszyński et al., 2021; FitzPatrick et al., 2019; Jankowski & Gujski, 2022; Luo et al., 2022; Siuda & Pluta, 2020; Thapa et al., 2021; Tsao et al., 2021; Wawrzuta et al., 2022)*

User Type	Health Interest	e-health Literacy	Susceptibility to Information	Susceptibility to Manipulation	Online Activity	Population Description
Opinion leaders with "negationist" views (e.g., antivaxxers)	High	High	Low	High	Active	<2%. Many of their medical decisions are based on OHI. Not receptive to arguments outside their information bubble.
Those who adopt negationist views e.g. ,antisanitary"	Low	Mixed	High	High	Passive	~20%. Some of their medical decisions are based on OHI. They internalise conflicts between standard medical information and disinformation.
Youth engaged in risky health behaviors	Low	High	Mixed	High	Mixed	<2%. They use OHI but do not typically make major medical decisions based on it. Social media play a major role in shaping their health attitudes.
Interested in popular knowledge, Family Caregivers	High	Mixed	High	Mixed	Passive	~20%. Primarily adult women. A significant portion of their medical decisions is based on OHI.
Excluded	Low	Low	Low	Mixed	No	~10%. Mainly older men. Amost never use OHI and never base decisions on OHI.
Chronic Patients	Mixed	Low	Mixed	Mixed	Passive	~20% Widely used Dr Google for initial inquiries and seek peer support.
General healthy Population Having other prorities	Low	Low	Low	Mixed	Passive	~20% Mainly older adults Rarely use OHI outside of Dr Google and links send by alters and rarely base decisions on OHI.
Pro-health opinion leaders	High	High	High	Low	Active	~5%. Regularly use OHI (especially encyclopedic sources and scholarly articles).

Positive and Negative Aspects of OHI's Influence on Medical Decisions

Studies on how people search for information online, along with media profile analyses, encourage questions about how internet-sourced content ultimately influences medical decisions. A meta- analysis of 48 studies on the influence of Internet-sourced information on medical decisions suggests a positive conclusion (Thapa et al., 2021). Study participants (over 43,000 people from various countries) mostly believed OHI positively affected their health decisions. Consumers of Internet- based knowledge use it to better grasp and absorb information received from medical professionals. Internet-sourced information helps patients better comprehend their diagnosis and participate in treatment decisions (Chang et al., 2020). It also serves as a tool to aid in asking the right questions during medical appointments and generally improves treatment adherence (Perazzo et al., 2017). We thus see four positive outcomes in the realm of health literacy and the doctor-patient relationship.

Internet-sourced information helps patients prepare for communication with healthcare providers, giving them the necessary vocabulary and boosting their confidence.

Further findings from the meta-analysis showed the supportive and motivating function of OHI in medical decisions. Participants reported a positive impact of online information on health behaviour such as dietary changes, regular exercise, scheduling doctor's visits, maintaining consistent medication use as prescribed, and improved self-care.

Some studies found a neutral impact of OHI on health decisions. Though these are a small number within the meta-analysis, they somewhat temper the certainty of researchers regarding OHI's positive influence. For example, Kirschning & von Kardorff (2008) showed that men with prostate cancer believed OHI contributed to continuing their chosen therapy (53%), whereas some women with breast cancer (31%) initiated additional therapy based on what they found online. Participants noted that OHI rarely caused them to question their doctor's diagnosis or switch to a different treatment plan (Cocco et al., 2018), nor did it affect the frequency of doctor visits (it neither increased nor decreased them) (Baker et al., 2003). In another study, 78% of cancer patients said OHI improved their understanding of their diagnosis, but 56% stated that such information did not influence their medical decisions (McLeod et al., 2017).

The quantitative indicator of the percentage of Internet users who said OHI influenced their health decisions ranged from 11.2% to 80.7%, though most studies reported 30–60% (Thapa et al., 2021). One main differentiating factor was the specific type of decision. For example, 53% of female cancer patients considered online searches a way to reinforce their treatment decisions (Nguyen & Ingledew, 2013), while 19.6% of patients considering surgery decided to undergo the procedure based on online information (Glynn et al., 2013). Online searches influenced decisions about birth method (vaginal birth vs. cesarean), medication use during pregnancy, and level of physical activity (Taştekin Ouyaba & İnfal Kesim, 2021).

A study by Chen (2018) investigating the effect of Internet-based vs. traditional sources of medical information revealed that searching online for problem-solving reasons correlated positively with making or changing a medical decision. The more often patients sought information, the more they were prone to adjust their decisions. At the same time, people who obtained medical knowledge through formal medical sources (medical staff, printed trade journals) more frequently discussed online information with their real-life social networks and were less likely to change their decisions based on OHI compared to those who obtained information from other patients (unofficial medical knowledge). Chen's model explained 38% of the variance in changes to medical decisions (Chen et al., 2018).

While most studies describe OHI's effect on patient medical decisions, in most of them patients said direct contact with a medical professional was the main factor shaping their final decisions (Kirschning & von Kardorff, 2008). Online searches typically serve as a supplementary information source. Qualitative research (Thapa 2020) also showed participants tended to have a favorable view of OHI's beneficial role in patient decisions. Online content helps people better understand and "internalise" the diagnosis given by their doctor and join in making therapeutic decisions (enhancing patient autonomy). Over 60% of cancer patients believed their decisions partly stemmed from Internet-based knowledge, and 50% said it helped them participate more actively in decision-making with their physician (Chang et al., 2020). In Miller et al. (2020), 27% of patients said they grew more interested in a medical procedure (using a surgical mesh) after doing their own online research following an initial consultation with a doctor, and 50% of patients who searched online noticed discrepancies between the web content and what the doctor had explained. Studies therefore suggest that Internet searches can strengthen a patient's position in dealing with a medical professional, allowing them to come prepared and to ask relevant questions during an appointment (patient empowerment), and can also improve adherence to medical recommendations (Iverson et al., 2008; Perazzo et al., 2017).

Statistically significant correlations have been found between OHI and how people perceive its role in modifying health decisions, the number of physician visits, the questions asked at medical appointments, treatment compliance, physical activity, and lifestyle changes in line with recommended medication regimens. However, in 3 out of 14 statistical analyses of OHI's effect on patient decisions, the link between OHI and decision-making or compliance was not confirmed.

Some studies also documented the influence of online searches on the choice of where to get treatment (hospital, clinic) and which physician to see. In Polish research from 2016, 32% of respondents decided against choosing a particular provider based on online information. Furthermore, only 15% of respondents went to a specialist despite negative online comments, while 56% opted for a different provider altogether. The effect of online reviews on a physician's selection varied with medical specialty. Respondents most often (78%) chose a specialist (usually a gynecologist, dermatologist, orthopedist, or ophthalmologist) and dentists (46%) based on online information. Significantly fewer (18%) looked for information and reviews about a family doctor, likely because convenient location is the main criterion. Over 80% of

respondents had at least once chosen a provider based on online information, and over half had done so exclusively based on it (Cholewa-Wiktor, 2017).

About 6 of the 48 studies in the meta-analysis indicated a negative impact of online searches on health behaviors. Research from 2006–2009 found that users of Internet information had difficulties continuing recommended therapy. In 2016–2017, patient accounts emerged suggesting discontinuation of therapy due to online information or switching to alternative therapies (26.70%). In Polish research by Bujnowska-Fedak (2020), a link was demonstrated between using the Internet to get information and canceling medical appointments or withdrawing from a prescribed treatment plan.

It has been shown that Internet users with minimal knowledge and poor health literacy rarely take the time to review and verify the lists of sources provided by a search engine. Meanwhile, patients with high health literacy seek out additional information and test the first pieces of information they encounter (Suzuki & Yamamoto, 2021). Patients with negative views regarding a medical procedure (e.g., the use of a surgical mesh) are more likely to look for online information about it, learn more about complications, and less about its benefits compared to those who had positive attitudes from the start (e.g., those who had undergone the procedure previously) (Miller et al., 2020). Such findings illustrate "bias seeking," where patients look for information that confirms their beliefs. The negative aspects of self-acquired knowledge may be mitigated by a good doctor-patient relationship.

The COVID-19 pandemic intensified the use of the Internet, as much of daily life, including medical services, migrated online. The Internet became a medium for meeting demand (queries in Google about the pandemic) and supply (content from news services or social media users) of information (Eysenbach, 2020; Tsao et al., 2021). Interestingly, interest in specific COVID-19 symptoms, such as loss of smell or taste or oxygen desaturation, correlated in Poland (by around a one-week lead) with the recorded infection numbers during the so-called 2nd wave, and queries about "isolation" matched waves 3 and 4. There was a large increase in knowledge during the mass vaccination programme against COVID-19 (Kachurka et al., 2021; Walkowiak et al., 2022). We have learned there is no simple correlation between the demographic structure, the intensity of OHI usage, and the decision to get vaccinated (e.g., the paradox of women, who use OHI more than average, yet whose refusal rate for vaccination exceeded the population average, or older individuals with lower health literacy who were more willing to be vaccinated than average).

In summary, the impact of OHI on medical decisions can be described as moderate in intensity, generally positive, and mostly supplementary to—and supportive of—users' health competencies. Medical professionals are most frequently named as the primary source of health information and decisive guidance. Studies indicate that most often a medical decision will be changed under the influence of OHI if it involves:

- Choosing a course of treatment (surgery vs. non-surgical therapy)
- Communication with the doctor (OHI helps patients ask better questions during an appointment, influences the frequency of visits)

- Self-treatment (adherence to medical recommendations, adopting new therapies based on OHI, including non-conventional therapies)
- Pro-health behaviour and self-care (introducing healthier diets, regular physical activity, quitting smoking)
- Negative OHI influence on medical decisions has been observed primarily among users with low health literacy.

The Role of the Media in Health and Ethical Risks

How media function in the health domain—and potential ethical risks—poses an important question. The significant influence of online user activity on health decisions (regarding service usage, provider selection, and participation in therapeutic decisions) is a difficult area to investigate from a social science perspective. Many research reports focus on small groups of patients with specific health issues, rather than on entire populations that experience both short- and long-term health problems, ranging from minor to life-threatening. Self-evaluation methods (in which respondents estimate how OHI influences their decisions) are subject to numerous psycho-emotional factors, and decision- making theories rarely address online sources of knowledge (except when choosing a provider or medical facility).

Table 3 summarizes the main insights regarding OHI's effects on medical decisions, highlighting the cognitive, emotional, and behavioral dimensions.

Table 3.
How searching for health information online influences medical decisions

Functions of OHI in shaping medical decisions		
Cognitive sphere	**Emotional**	**Behavioural**
- Increases interest in Health Informational function: supplementary to what a doctor says; helps better understand and absorb a doctor's diagnosis, enabling more active participation in therapy - Validation function: confirms a diagnosis/treatment plan suggested by a physician - Educational function (health literacy, self-education), supplying the knowledge needed to ask questions of a doctor - Provides "counter-knowledge" by offering an alternative perspective on medical risk than one may hear from a physician	- Motivational function: encourages adopting healthy behaviour, e.g., by presenting models of a healthy body or medical norms - Encourages continuing behaviour, e.g., therapy compliance - Increases self-confidence and a sense of personal efficacy - Supplies social and emotional support (e.g., backing for decisions) - - Can provoke anxiety - Can lead to information overload and frustration due to the huge volume and variety of opinions - May erode trust in professionals and impair patient-physician relation	- Increases or decreases the number of doctor visits (economic/staffing implications) - Influences the choice of doctor or medical facility - Affects compliance or non- compliance with medical recommendations - Improves self-diagnosis, self-care, and self-prescription of treatments (including additional therapies) - - Causes users to withdraw from fact-checking - Risk of cyberchondria or becoming addicted to information sources

The findings on behaviour in the medical decision-making sphere prompt questions about the ethics of online media and the extent of their shared responsibility for health literacy among users of medical information. A particular challenge here is content that runs counter to evidence-based medicine, as well as allowing virtual "pseudo-therapeutic" groups to operate—ones that promote harmful or iatrogenic content and undermine trust in medical professionals. Considering the high potential influence on users' health decisions described in this article, freedom of speech in the health domain is significant for implementing the kind of responsibility for individual and public health required by public health standards (Public Health Act, 2016). The media's educational and motivational roles, which support users in making correct health-related choices, call for continuous monitoring of content and intervention against information that causes "population-level harms." Where media content cannot be controlled due to the nature of democracy or an open society, it would still be beneficial to encourage corporate social responsibility programmes—e.g., content ranking and improvements in the ability to interpret medical information. Without such measures, online media—as providers of OHI—may be viewed as partly responsible when patients discontinue treatment or make wrong decisions (e.g., buying supplements or medications from illegal sources) and, consequently, worsen health indicators in the broader population. In such cases, media outlets should be motivated toward self-regulation. Indeed, we already see similar efforts: in a "Media Round Table" initiative on November 25, 2019, television broadcasters and organisations representing manufacturers of dietary supplements (PASMI) jointly signed an agreement outlining standards for advertising dietary supplements so they do not undermine public health (http://www.archiwum.krrit.gov.pl/krrit/aktualnosci/news,2897,okragly-stol-mediow---porozumienie-nadawcow-w-sprawie-rozpowszechniania-reklam-suplementow-diety.html).

Media also influence medical decisions through motivational efforts, such as forming or disseminating moral judgments about those who do not follow health norms (leading to encouragement of healthful decisions such as adopting regular exercise). Supporting online support groups for individuals seeking medical information or facing disease, along with facilitating the presence of health-promoting and knowledge-based websites, should be part of the social responsibility policy of media-sector companies. At the same time, it remains crucial to boost institutional sources of knowledge, constantly updating information—potentially via opinion leaders, "translators" of medical knowledge (in the Baumanian sense, sometimes called "celebrity-based medicine"), but above all the under-recognised role of health educators, public health specialists, etc. It is also vital to properly integrate personalised medical information systems, especially a functional and well-designed patient portal. Under the oversight of a qualified educator (or doctor) who supplements it with reliable data, this could become a satisfactory and safe source of information for the patient, helping in making or validating decisions (Mold et al., 2015). The latest meta-analyses show that giving patients access to their own records often improves treatment

adherence and medication compliance (Assiri, 2022), though it also raises potential risks of excessive surveillance and reduced patient autonomy.

Conclusion

The amount of medical knowledge on the Internet is steadily growing. In addition to professional health platforms and quasi-professional websites, there are personal "pathography" blogs by people experiencing illness, and other sources distributing both accurate and inaccurate information. The sheer volume of data and often contradictory opinions can lead to confusion and a loss of trust in healthcare professionals and conventional medicine. The presence of various professional and non- professional, educational and commercial "circles" of medical knowledge fosters the deprofessionalization of medicine, making it easier for false and harmful medical myths to spread. Credibility of medical content (Nabożny et al., 2025), can be assessed from both computer science (i.e. use of AI) and medicine (u.e. human assessment). Though literature reviews indicate that patients generally have a positive perception of how online searches impact medical decisions, one must not overlook studies that show no confirmed correlation or demonstrate "bias seeking." Feeling overwhelmed and fatigued by information overload can drive users away from searching altogether—or diminish their cognitive capacity to compare facts or assess credibility. This can curtail the educational potential of online sources. It is therefore crucial to monitor the power of online information in shaping medical decisions continuously. From a sociological standpoint, this raises questions about the ethical dimensions of online media, including freedom to publish content that contradicts evidence-based medicine.

In an environment flooded with information, a new phenomenon is emerging: the doctor not only as a diagnostician and therapist, but also as an "informational aide." This fits into the physician's educational role in patient communication, where the doctor not only shares knowledge but must also continually update it. The patient can, in theory, also serve as a knowledge provider for the doctor, but in practice that role is not widespread, and true "patient empowerment" remains more a theoretical construct than a clinical reality (with some exceptions, such as academic medical blogs).

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