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RESEARCH ARTICLE

Internet Health Information on Patient's Decision-Making: Implications, Opportunities and Challenges

Elena Soto-Vega¹, María Fernanda Pérez-Zepeda¹, Eduardo Lome-Gutiérrez¹, María del Carmen Cabrera-Martínez¹, Samia Gómez-Gómez¹, Sebastian Duno-Caldera¹

¹ Escuela de Medicina, Universidad Anáhuac Puebla.

Corresponding author

Elena Soto Vega

Elena.soto20@anahuac.mx

Universidad Anáhuac Puebla

Orión Norte S/N, La Vista Country club, San Andrés Cholula, Puebla México 72810

ABSTRACT

The accessibility of online health information has changed the decision-making process for patients concerning their health. Nevertheless, concerns persist regarding the quality and reliability of the information available on the Internet. The Internet has emerged as the dominant global source of health-related information, with a significant proportion of individuals utilizing it to retrieve information on nutrition, diseases, symptoms, and treatment options. However, the unregulated nature of online health information poses challenges in terms of assessing its credibility and accuracy. Increasingly, patients are actively engaged in healthcare decision-making, empowered by the information they acquire online. Consequently, a paradigm shift from the traditional physician-centric model to a more collaborative and patient-centered approach has occurred. Patients now have access to an expanded array of healthcare professionals and possess the ability to make informed decisions regarding their treatment and care. Nonetheless, the variability in quality of online health information and patients' limited capacity to effectively evaluate it can give rise to misunderstandings, misinformation, and an elevated propensity for self-diagnosis and self-treatment.

Furthermore, patients' reliance on online information can impact the patient-physician relationship, with discrepancies between online findings and physician diagnoses leading to dissatisfaction and conflicts. Barriers obstructing effective patient-physician communication on online health information include patient's apprehension about challenging physicians, perceived resistance from physicians themselves, and difficulties in comprehending and articulating the information sourced online. Addressing these barriers and enhancing the patient-physician relationship can yield positive outcomes, including timely diagnosis, effective treatment, and shared decision-making. While Internet use brings advantages such as increased accessibility to healthcare providers and enhanced patient empowerment, it also introduces certain disadvantages. The prevalence of misinformation and disinformation on the Internet engenders risks, contributing to confusion and a lack of trust in healthcare institutions. Additionally, patients may encounter challenges in interpreting and prioritizing the information they find online, which can result in heightened anxiety and uncertainty regarding their health. This review critically examines the impact of Internet use on patient decision-making and its effect on the patient-physician relationship.

Keywords: Internet, decision-making, online health information, patient-physician relationship

INTRODUCTION

The way patients make decisions about their health has evolved throughout history, and never have they had access to as much information as they do now with the Internet. However, the challenge is to use this powerful tool correctly. Individuals can find information ranging from disease prevention to treatment online. One of the main problems of modern medicine is that patients often make self-diagnoses using information they find online, which can lead to incorrect decision-making and negative impacts on their health.

The Internet has become the primary source of information worldwide, with an estimated 2 billion people having access to it. Online health information has grown substantially since the 1990s. However, most of the information on the Internet is unregulated, and its quality remains questionable. For patients, it is difficult to judge the reliability of health information found online. According to a study,¹ 4.5% of all Google searches worldwide are related to health issues. The most frequently searched health-related topics are nutrition, food, and healthy lifestyles (54.2% of respondents), previously diagnosed diseases (52.1%), symptoms (50.9%), and remedies (47%).²

PATIENT'S ROLE IN HEALTHCARE DECISION-MAKING

The process of decision-making involves selecting the best course of action from a range of available alternatives. This selection is based on various cognitive processes, including the identification of personal objectives, motivation to pursue these objectives, evaluation of potential outcomes, and finally, a selection of the most congruent outcome with the objectives. This complex cognitive process is crucial in healthcare decision-making and may have implications for patient care and treatment outcomes.³

In healthcare, patients need to make informed decisions about their treatment and care. The ability of patients to make informed decisions enhances their sense of control over their health and treatment, which in turn promotes patient empowerment and engagement in the healthcare process.⁴ With the widespread availability of health information on the Internet, patients can access health-related information easily, leading many to search for information online before consulting a healthcare professional.⁵ While this has resulted in patients feeling more empowered and engaged in their own healthcare decisions, there are concerns about the quality of online health

information and the potential negative impacts on patients.⁶

In recent years, the Internet has become an increasingly common tool for medical consultation, due to its speed and ease of access. It is used by people as a medical supplement or even to confirm certain beliefs.

INTERNET'S IMPACT ON PATIENTS

Patients often turn to various digital platforms, such as personal blogs, social media, and websites, to gather information about their health concerns. However, the varying quality of medical information offered across these platforms raises concerns about the reliability of the information patients are exposed to. The quality of medical information on the Internet can range from trustworthy and evidence-based to inaccurate and misleading.^{7,8} The varying levels of information quality, coupled with patients' limited ability to evaluate medical information, can lead to misunderstandings and misinformation, as well as increased self-diagnosis and self-treatment.

Physicians may find themselves in a new interpretive role, answering questions and addressing concerns raised by patients who have consulted online sources. Additionally, discrepancies between online findings and physicians' diagnoses or treatments may lead to dissatisfaction, conflicts, or disagreements between patients and physicians, with patients potentially searching for second opinions, changing physicians, or altering their treatment plans.⁹

Despite the quality of information, patients encounter on the Internet, they have begun to assume a more active role in the decision-making process and have experienced increased ease of communication with their healthcare providers.¹⁰ It is widely acknowledged that not all patients are equally affected by these changes, as the degree to which patients engage with and utilize these technologies varies significantly based on factors such as sex, age, culture, education, and socioeconomic status.¹¹ A study made in 2020,¹² observed that as age decreases, the use of the Internet for searching healthcare providers and communicating with them also decreases. Older individuals also search for less health information on the Internet compared to younger individuals. These changes associated with aging may be related to difficulties or frustration in accessing online information or trust in health information from online sources. Younger individuals use more social media to search for health information than older people.

The authors also reported that participants with lower education levels used the Internet less to communicate with health providers, search for health information, or use social media. There were ethnic disparities in the use of the Internet, among others.¹²

Despite these variations, the growing prevalence of patient engagement in healthcare decision-making is reshaping the traditional healthcare model, where patients were largely passive recipients of care, into a more collaborative and patient-centered approach.¹⁰

BENEFITS OF THE INTERNET USE

The Internet has revolutionized the way patients search and access health care, providing them with a powerful tool to take charge of their health and make informed decisions about their medical treatment. One of the advantages of patients accessing the Internet is the easiest way they can locate healthcare providers, who specialize in treating their specific medical condition. This access to a wider pool of healthcare professionals allows patients to identify the most appropriate and experienced physicians available, potentially leading to better outcomes and improved quality of care. The attitude of patients with some type of medical condition who search for information about their clinical manifestations changes and acquire greater security during their decision-making regarding their health, also adopt a more active role focused on the search for their well-being.¹⁰

PATIENT'S SEARCHING BEHAVIORS

As previously mentioned, the rapid growth of Internet access has resulted in more patients turning to the Internet as their primary source of health information.⁹ It is important to consider that the information patients consult online can shape their thoughts, concerns, and expectations, which can directly affect the patient-physician relationship, especially when online inquiries are raised during consultations.

Online health information content can vary widely, ranging from professionally reviewed content to personal blogs or social media posts from other patients. As a result, the quality of information can vary, and patients may lack the necessary skills to evaluate medical information and apply it to their own health circumstances.¹³ Searching information also plays a significant role in individuals' engagement in medical decisions, underscoring the

importance of studying and understanding patients' health information-searching behaviors.¹⁴

The Health Information National Trends Survey in 2005, revealed that 63.7% of the online population searched for health information online, with 48.6% reporting going online before consulting a physician.¹⁵ These findings suggest that even 15 years ago, US adults preferred to use the Internet to search for health information before approaching a healthcare professional. Diaz's survey of 1000 individuals estimated with the use of the Internet for health information ranges from 30 to 80%.¹⁶ It's worth noting that Internet access can be influenced by socio-demographic factors, with the frequency of use being linked to perceived needs.¹⁷ Tan's review of online health information and its impact on the patient-physician relationship revealed that a common tendency when searching health-related data is to rely on online advertisements or recommendations regarding medications and treatment options believed to be relevant to their own health condition.⁹

Kyriacou's survey explored where, how, and why patients search for online health information. Among the 398 respondents, the Internet was the most prevalent source of information, with 78.1% of participants indicating its use.¹⁸ Of those searching health information, 76.6% gathered web-based information to prepare for consultations using search tools like Google, Yahoo, and Yandex. Patients reported selecting specific websites primarily based on their search engine rankings. A minority chose websites affiliated with healthcare institutions, academic institutions, or disease-specific societies. When asked how they determined the trustworthiness of a website, patients most cited its association with an academic institution. Roughly three-quarters of patients rated online health resources as either "good" or "very good" in terms of quality, while approximately half considered them "reliable" or "very reliable." It's worth noting that only 22.9% perceived the information received from their physician as better or much better than that obtained from Internet sources. When asked whether they were aware of how to identify websites with certified reliable information, most participants (59.4%) reported a lack of awareness.¹⁸

Demographic factors and other variables can influence patients' information-searching behaviors.⁵ However, it's valuable for physicians to take note of these usage patterns as they relate to a significant portion of the patient population. Most research indicates that searching health information

online can enhance the patient-physician relationship, if patients discuss the information with their physicians and have a pre-existing relationship.⁹

PATIENT'S EMPOWERMENT

The conventional physician-centric model, characterized by the physician as the primary holder of power and knowledge, has undergone changes due to the increased accessibility of health information online, leading to both positive and negative effects. As previously noted, the availability of such information has conferred patient empowerment in healthcare decision-making. Research suggests that it imbues them with a sense of control over their health status. Patients are now better equipped with medical knowledge, allowing them to actively engage with physicians concerning their diagnosis and treatment options, with a greater understanding of the medical terminologies employed during consultations. This, in turn, is advantageous for the physician, as active communication, discussion, resolution of doubts, elucidation, and comprehension of diagnosis, as well as joint decision-making with patients, can foster a better patient-physician relationship.¹⁹

PATIENT-PHYSICIAN COMMUNICATION

The Internet is a double-edged sword, patients can access medical information that can facilitate their understanding of their health status, diagnosis, and treatment, the patient-physician relationship can also be adversely affected if the use of online resources is not properly guided. In this regard, physicians have an important role to play in guiding patients to use credible and reliable websites that can improve their medical knowledge and enable them to make informed decisions.

The patient-physician relationship can be significantly impacted by the medical information that patients obtain through online sources. As such, it is crucial to emphasize the way patients communicate this information to their physicians, to facilitate knowledge acquisition, clarify doubts, and guide the patient's decision-making process. Several barriers limit patients' communication with physicians regarding online health information. These can be divided into three main types:⁹

1. Physicians being challenged: Patients may not communicate medical information they find on the Internet out of fear that the physician will perceive their knowledge as being challenged, questioned, or insulted.

2. Physician resistance: Patients may perceive an attitude of resistance or discouragement from physicians when expressing and discussing the information they have found, which may lead to physicians discrediting or mocking the patients for informing themselves via the Internet.
3. Fear of embarrassment: Patients may decide not to communicate information found online due to their inability to understand the information fully or explain it to their physician.

Other barriers include patients believing that the information obtained is not important enough to communicate, fear of interfering with the diagnosis and treatment given by the physician, and a lack of time during the medical consultation to express doubts and concerns.

Improving the patient-physician relationship can lead to positive outcomes, ranging from timely diagnosis to effective treatment and shared decision-making, ultimately leading to improved patient quality of life. It is important to acknowledge the impact of the Internet on patient health information searching, as this can indicate changes in the development of the patient-physician relationship and its influence on treatment adherence. Non-adherence to medical treatment can have severe consequences, including worsened health status and even death, as well as administrative implications such as increased costs and loss of resources.¹⁹

With the improvement in Internet access in recent years, patients have greater access to health information, providing them with relevant information for their benefit and resolution of doubts. However, the fear of disapproval from physicians remains a major concern for patients. Patients may feel insecure when expressing their opinions on health matters, fearing that physicians may react with hostility or irritability, leading to poor quality of medical consultation. This can result in anxiety, frustration, and confusion due to a lack of empathy from physicians.¹⁹

PARTICIPATION IN CLINICAL TRIALS AND RESEARCH STUDIES

In a recent experimental study published by Kwakernaak et al., vignettes were used to analyze the strategies applied in searching for information on the Internet and how these strategies, along with demographic characteristics and website quality, are related to achieving a correct diagnosis.²⁰ The study also examined topics such as the perception of diagnosis after searching the Internet and

patient-physician communication about the information found on the Internet. Results indicated that while Internet search can encourage self-diagnosis, only 26% of those who self-diagnosed did so accurately.

The study analyzed factors and characteristics that influenced Internet search strategy, aiming to identify why some participants were successful in achieving a correct diagnosis while others were not. Findings suggest that most patients conduct their Internet search focused on the symptoms they are experiencing, and the search strategy is related to the scenario surrounding the participants and the severity they perceive in their condition. The research confirms that a younger age has a significant relationship with diagnostic accuracy, as younger people have more experience searching and browsing the Internet, which influences their ability to achieve an accurate diagnosis. However, the study did not demonstrate a significant relationship with higher education, as the study population included a few participants with a low educational level.²⁰

The investigation also analyzed the quality of the websites used and found that those participants who obtained high-quality websites were more likely to find the correct diagnosis. High-quality websites were often created by hospitals, associations, or medical departments, whereas low-quality websites were associated with health forums where anyone can post information without quality control or veracity. The study showed that Internet searches did not change the self-esteem severity score that the participants believed before the search, indicating that people do not achieve peace of mind after searching the Internet and still consider a visit to the physician necessary.

Kwakernaak et al., recognized the importance of guiding patients in their Internet search through trusted websites and professionally verified information. However, they suggest that more research should be conducted on this subject, including examining the impact of Internet searches on patient decision-making.²⁰

DISADVANTAGES OF THE INTERNET IN THE PATIENT'S DECISION-MAKING

Generally, the order of websites on major search engines significantly influences Internet users. Research has shown that most users do not exceed the first two pages of links, which typically contain 20-50 links. Moreover, the order of search results can be influenced by paid sites.²¹ Eysenbach et al., reported that 70% of websites providing health

information have significant quality issues.²² The main problem with health information on the Internet is the prevalence of misinformation and disinformation. Misinformation refers to wrong or misleading information, while disinformation is deliberately false information. Both can lead to serious consequences, including confusion and mistrust of health institutions and programs.²³

The acquisition of medical information from multiple sources can alter patients' perceptions of their disease. Patients without professional knowledge may struggle to identify relevant and correct information, leading to anxiety and uncertainty about their health. This problem arises from the misinterpretation of information found on the Internet.²⁴

Bunjnowska et al. found a relationship between the increase in the frequency of Internet use and the number of patients who abandon tests and medications.¹⁰ Patients who cancel or change the date of their medical appointment do so due to their employment situation and the frequency of their Internet use for health purposes. These findings indicate that the Internet's role in healthcare can have negative consequences.

Another research found that patients report improvement after searching the Internet for their acute symptoms and obtaining health information related to the natural history of the symptoms. However, those who decide to visit a physician after searching the Internet often report that the reason they decided to visit a physician is that they did not improve with the information obtained. This finding suggests that health information obtained on the Internet influences patients' decisions, such as whether to wait for symptoms to resolve or search for medical consultation.²⁵

It is crucial to recognize that health information obtained from the Internet can have negative effects. These range from affecting patients psychologically to generating confusion and uncertainty, leading them to change or abandon a treatment without consulting their physician.²⁶

Previous studies have found that different factors influence people's criteria for determining the reliability of a source of information, such as age and education level.^{27,28} Overall, websites of organizations with a good reputation are considered more reliable, as they transmit the necessary confidence to make readers believe that they provide true and trustworthy information. Conversely, web pages that offer a product or

service and demonstrate an inclination towards contracting or buying them are often avoided or discarded.²⁹

FACTORS THAT INFLUENCE INTERNET USE BY PATIENTS' CHARACTERISTICS

The use of the Internet to search for health information has led to an increase in misinformation. People with limited digital and health literacy skills are more likely to encounter misleading information or become confused due to the vast amount of information available online. Even a limited level of digital skills can act as a barrier for those searching for health information on the Internet.

Various factors influence patients' Internet use, including age, gender, chronic conditions, level of education, and social and cultural elements. These factors can change the patient-physician relationship, for better or worse. Age can be a significant factor in the patients' interest in searching for health information online, as older patients may have less trust in online sources or find online platforms less user-friendly.³⁰ However, it's essential to consider each patient's individual circumstances to determine how the Internet may affect their health care decisions and habits. For example, younger patients with higher education levels and living in urban areas tended to search for health information online and adopt suggested measures. On the other hand, middle-aged and elderly patients, or those in rural areas, were less likely to search for information online and less likely to adopt suggested changes.¹⁰

Women tend to be more interested and critical than men when searching for health information on the Internet. A study found that women often take on greater responsibility for their own health and for the health of other family members, which could explain their increased interest in searching for high-quality health information online.³¹

People with chronic diseases are more active in searching for information about their conditions on the Internet. Using online information helps them control their conditions and increase their participation in their own health.³² Education also plays a fundamental role, as searching for health information requires the ability to use technological devices, to read, understand, discern, and analyze information.³²

Although some patients search for health information online, there are many factors that can increase or decrease this trend. For example, during

the COVID-19 pandemic, a survey study found that people trusted social media for health information. Almost 76% of the 1,003 surveyed searched for health information online, indicating a strong desire for knowledge about their health.³³

As patients increasingly turn to the Internet for health information, there is a growing need for education and training on how to properly evaluate the quality and reliability of the information found online. While the Internet can provide patients with access to vast amounts of health-related resources, the overflowing information available can be overwhelming and difficult to navigate and understand. Patients need to learn how to critically assess the credibility of sources, evaluate the accuracy of the information and distinguish between evidence-based information and anecdotal or opinion-based content. Without adequate education and training, patients may be at risk of making decisions based on inaccurate or unreliable information, potentially leading to poor health outcomes. Therefore, health care providers play an important role in educating patients on how to effectively utilize the Internet as a tool for decision-making in health care.

CONCLUSION

The use of the Internet has become essential for many people, providing an easily accessible source of information. However, in the case of health information and patient decision-making, it can be a double-edged sword. Patients may arrive at a consultation with an Internet diagnosis that could influence the physician's decisions or, conversely, lead to more informed treatment decisions.

Currently, it is estimated that 7 to 10% of Internet searches are related to health, yet the quality of information presented online is variable and not regulated. Therefore, it is crucial that patients receive guidance from a specialist on where and what to search for in health information. Symptoms, diseases, treatments, medications, and other health topics are commonly searched to make informed decisions about one's well-being. However, self-diagnosing an illness via the Internet poses several risks, including:

- Misleading or inaccurate information: Not all online information is accurate or reliable. Inaccurate information can lead to misdiagnosis and possibly inappropriate treatment.
- Anxiety and Stress, when patients search for information about their symptoms, they

may find wrong information about serious illnesses, and this can have a negative impact on the person's mental and emotional health.

- Lack of context: information online is often presented without the proper context and the information can be misinterpreted.
- Incomplete or inaccurate diagnosis: the symptoms of many diseases can overlap and be like those of other conditions. An accurate diagnosis requires a complete physical examination, laboratory tests, and other studies. Self-diagnostics can be incomplete or inaccurate and can lead to misdiagnosis.

It has been reported that physicians may view patients who use the Internet to inform themselves about their health as a challenge to their power and may employ disciplinary strategies to reinforce traditional patient roles, potentially alienating patients.

The Internet is a very powerful tool with which health systems and physicians should not struggle, it is important to find a way to integrate the Internet into their consultations, as part of the treatment, especially in chronic diseases. However, regulating health information on the Internet is necessary. Regulatory authorities of health systems should establish quality standards, such as information source verification and scientific evidence evaluation, and establish penalties for disseminating misleading information. Promoting online health education is also critical to improve users' ability to make informed decisions about their health and to recognize reliable sources of information.

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