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Knowledge Representation and Reasoning

Dr.Google in Patient-Physician Interactions: Pros and Cons

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ABSTRACT

Dr Google has evolved with time from being a medical infopedia to an artificial intelligence (AI) powered provider capable of interacting with patients in real-time due to the involvement of social media and AI chatbots. Dr Google is not only consulted as a pre-visiting health information searching tool but also provides health monitoring and treatment plans. With the help of social media, people can connect and share medical information through health forums and YouTube videos and seek help. However, it can create new challenges for medical providers through rapport building, challenging preconceived notions, and managing unnecessary patient demands. The involvement of Google can have advantages and disadvantages from patients' and doctors' viewpoints and can affect the physician scoring system and insurance reimbursement. Hence, it is critical to review the pros and cons of Google's involvement in medicine and understand the possible future implications.

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Review

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INTRODUCTION

Dr Google is considered a widely accessible medical information platform on the internet, providing website articles, videos, blogs, discussion forums, and recently available AI chatbots, such as ChatGPT. These platforms can provide information on health and disease, including the natural history of a disease, the presumptive diagnosis, and treatment options.[1] In the modern era, Dr. Google has evolved to encompass emerging platforms, such as data-based AI models and social media networks like Twitter, Facebook, YouTube, and Reddit forums, which are faster and more interactive. Individuals can interact and share information with the help of direct messages, webinars, online promotions, and collaborations.[2] People using the internet are more likely to report reassurance (regression coefficient=0.18; $p<0.0001$)[3], though there is not enough data on the quality of this information. The information on Dr Google could be of high quality and evidence-based through medical journals and official websites, or it could be suboptimal and biased in the form of medical blogs, discussion forums, YouTube videos, and health promotions on social media, and the information obtained through modern AI chatbots is questionable.[4,5] Google is the most popular search engine worldwide and is extensively used to access medical information by individuals before visiting their general practitioner (GP) to search for their symptoms and try to self-diagnose.[6,7] Instead of investigating what they might be experiencing and whether or not more testing is necessary, people use the information offered by Dr Google to schedule appointments with their general practitioners to explore the possibilities available online. The findings may impact the doctor-patient relationship with Dr Google, which may or may not align with the doctor's diagnosis and recommended course of treatment. Patients may request additional diagnostic testing.[8] It is also likely from such an interaction that patients may seek multiple opinions, change or negatively rate their physician or self-medicate, which lands the physicians in a situation where they may agree to fulfil a patient's demand.[9] It is feared that prescribing based on patient demand can lead to over-utilization of medical resources and affect the quality of care.[10]

The focus of this review article is to research how the internet-seeking behaviour of patients has changed with the introduction of social media and modern AI tools, laying down its advantages and disadvantages. It is crucial to review how Dr Google has affected the physician scoring system, insurance reimbursement, and future implications on the physician-patient relationship.

Pros and Cons of Dr Google

Patient's perspective

Doctors perceive the Internet as challenging current medical practice and therapeutic relationships. However, there are advantages and disadvantages to using the internet when looking from the patient's perspective. Since consultation with a doctor is time-limited, the Internet can be a supplementary guide to make patients more aware of their condition and educate them about available treatment options.[11] A study carried out by Al Ghamdi and Moussa[12] highlighted that 45% of the patients presenting to the physician had searched the internet for information before their appointment, 72.5% of them discussed the information with their doctors, and 71.7% of the patients who discussed the information believed that it had a positive impact on the physician-patient relationship.[12] On the other hand, bringing up and discussing the information searched for on the internet also led to conflicts between the patients and physicians. This stemmed from different interpretations of the online information, leading to a difference in opinion, often leading to patients ignoring the physician's expertise.[13,14] Some patients use the Internet as a replacement for healthcare services instead of a supplement, which can lead them to self-diagnose, seek information on alternative treatments and medicine, or engage in healthcare strategies inconsistent with medical recommendations.[15] The ease with which medical information is available on the internet causes patients to have cyberchondria, defined as increased distress and health anxiety due to repeated online searching, which persists despite interference with functioning and negative consequences.[16] The risk factors for the development of cyberchondria are poor coping with information overload, erroneous expectations of the internet, and confusion about the trustworthiness of the sources of online health information.[17]

Physician's perspective

Internet use by patients can serve as a big advantage to the physician in cases where patients use the abundant information available on the internet concerning wellness and disease prevention.[18] The internet can prove an effective channel for primary health promotion, encouraging people to scour the internet for health information and maintain a healthy lifestyle. This internet-based lifestyle intervention can overcome barriers to preventive counselling. It can help incorporate evidence-based lifestyle interventions into primary care, providing moti-

vation and methods for behaviour change.[19] The internet has benefited patients seeking cancer care since self-aggregating patient groups online helps find new research options and thus ensures faster enrollment in clinical trials.[20] There is increased medical content available online, which precludes the possibility of any health practitioner having information about everything that can be helpful to the patient.[21]

Patient-Physician Relationship

The physician-patient relationship is thought to depend on multiple factors, which include, but are not limited to, the prior relationship of the physician to the patient, patient demographics, etc.

Most patients in multiple studies reported that internet health information seeking did not adversely affect the physician-patient relationship.[11,18] A study by Newnham et al.[22] reported that 40% of patients felt that the physician-patient relationship was unaffected by internet searching, 24% felt that it improved the relationship, and only 8% felt that it affected the relationship adversely. The patients who perceived their relationship with the physicians had improved saw the internet as an additional source supporting the doctors' advice.[11]

In addition, a study by Murray et al. also highlighted the impact of physicians' reactions to patients sharing their online findings in determining the positive or negative effect on the relationship's quality.[9] In situations where the patients felt that the physicians were threatened by their bringing up online information, 49% of the patients were seriously dissatisfied with the consultation, and 4% believed that their relationship had worsened. Positive effects were observed when the physician was not challenged by the online information.[23]

Patient Satisfaction score

The involvement of Dr Google can introduce new challenges for physicians, such as elaborate debates with Google-informed patients and the dilemma of prescribing services at the patient's demand.[10] This can adversely affect patient satisfaction scores and may lead physicians to agree with the patient's needs in scenarios where high-value care may not align with patient satisfaction. For example, not suggesting early imaging for lower back pain or not prescribing antibiotics for upper respiratory infections can be considered low-value care.[24] This may lead to physicians being rated low by the patients, adversely affecting insurance reimbursement. Physicians may agree to such requests if they face penalties due to low patient satisfaction scores.[10] Moreover, a study found that higher patient satisfaction was associated with greater healthcare expenditure and greater mortality.[25] This may highlight the negative impact of Dr Google on the healthcare system. However, further research is needed to critically analyse the effects of Google-informed patients seeking healthcare services and physician rating systems.

Future Perspective

As Dr Google's influence continues to grow in the healthcare sector, there are various potential future perspectives on physician management and patient education. While acknowledging the constraints and challenges of using internet health information, it is crucial to investigate the possible benefits and opportunities Dr Google can provide.

Facilitating Patient-Physician Collaboration

In the future, healthcare practitioners should actively encourage patients to conduct online research by directing them to credible sources and giving tools for important information evaluation. By acknowledging and incorporating patients ' web research into consultations, physicians can establish a shared understanding and collaborate with patients to generate individualised treatment programmes. This collaborative approach can improve the doctor-patient relationship, patient satisfaction, and healthcare results.[26,27] It is crucial to understand that sometimes symptoms may be non-specific and not always indicate a specific disease. Sometimes, more than one symptom may confuse the diagnosis, especially in systemic diseases. In addition, the diagnosis of a severe disease may be delayed if the internet source misinterprets the patient's symptoms and findings, delaying the doctor's visit or directing the patient to the wrong specialist. Hence, the person who makes the final decision regarding examination, diagnosis, and treatment is a physician.

Leveraging Artificial Intelligence for Predicting Future Risk

Large amounts of medical information can be aggregated and analysed by online search engines from various sources, including academic publications, clinical studies, and health databases. This data can be analysed to determine certain illnesses' patterns, trends, and risk factors. Online resources can provide information on various symptoms and their possible causes. People can learn about potential health hazards by comparing their symptoms to the information offered. On the oth-

er hand, self-diagnosis should be treated cautiously, and it's always best to visit a healthcare expert for an appropriate assessment.[28,29] Recently, Google has made major advances in using artificial intelligence (AI) to forecast cardiovascular risk and strokes by utilising retail scans to screen patients for diabetic retinopathy. Google's AI technology has shown encouraging results in finding minor signs and patterns indicative of cardiovascular health by applying deep learning algorithms to an extensive collection of retinal images. AI algorithms may accurately forecast an individual's risk of developing cardiovascular illnesses and stroke using this novel approach, even before clinical symptoms appear. This technology has the potential to transform preventive healthcare by enabling early interventions, personalised risk assessments, and tailored treatment strategies based on non-invasive screenings that are easily accessible.[30]

Personalized Medicine and Precision Healthcare

In collaboration with upcoming technologies like genomics and wearable devices like smartphones and watches, Dr Google has the potential to pave the path for personalised medicine and precision healthcare. Patients may have access to internet platforms in the future that combine their health data, genetic information, and lifestyle factors to provide personalised health insights and suggestions. Physicians can use this detailed patient profile and their medical skills to provide precise, patient-centered care. By merging online health information and self-reported data, healthcare practitioners can better understand each patient's unique healthcare needs, resulting in more effective interventions and improved outcomes.[31,32]

Online Intellectual Property Rights Infringement of Scientific Work

A recent issue in the era of AI-powered Dr Google is the violation of the intellectual property rights of the authors of scientific sources, research papers and books. Questions concerning unlicensed content in training data, rights of use and infringement, ownership of AI-generated works, and whether or not users should be able to prompt these tools with direct references to other creators' copyrighted and trademarked works by name without their consent are all raised by these upcoming developments.33 It is also essential to consider the risk of Dr Google users being accused of intellectual rights violations by indirectly being able to access protected information. This issue is on the agenda in many countries, including the USA and China, and it is clear that current laws and regulations are inadequate and need updating.

CONCLUSIONS

The use of the internet for seeking health information, commonly known as Dr Google, has developed into a complex information-sharing and AI-generated aid. Dr Google can have pros and cons, requiring consideration of multiple factors. The impact of Dr Google on patient satisfaction scores is an emerging challenge that needs further research. Moreover, the future implications of Dr Google have promising benefits. However, the impact of such consequences can be better observed as Dr Google unfolds further.

Authors' Contribution

Study Conception: BS, PS, FA, GK, VG, RJ; Study Design: BS, PS, FA, GK, VG, RJ; Literature Review: BS, PS, FA, GK, VG, RJ; Critical Review: GK, VG, RJ; Manuscript preparing: BS, PS, FA.

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