Global Relevance of Online Health Information Sources: A Case Study of Experiences and Perceptions of Nigerians

Ommo Clark, MSc[1], Karuna P. Joshi, PhD[1], Tera L. Reynolds, PhD, MPH, MA[1]
[1]University of Maryland, Baltimore County, Baltimore, MD

Abstract
Online health information sources (OHIS) offer potential for improving access to health information especially in areas with limited healthcare infrastructure. However, OHIS predominantly originates from Western societies potentially ignoring the specific needs and cultural contexts of diverse populations. There is limited research on the global suitability of OHIS content. This study explores the global relevance of OHIS for diverse populations through a case study examining user experiences of Nigerians living in multiple countries. Findings reveal OHIS usage patterns are influenced by the country of residence and local health services availability. The study highlights the need for culturally inclusive OHIS content to ensure equitable health information access globally. Ultimately, for OHIS to serve a global audience effectively, there needs to be reliable information sources that acknowledge and cater to different users' cultural backgrounds, including prevalent health issues, medical practices, beliefs, languages, and healthcare expectations.

Introduction

The internet has revolutionized access to health information, with online health information sources (OHIS) becoming a ubiquitous resource for individuals worldwide(1). There is a vast amount of research showing that most people search for health information online to supplement the knowledge that they gain through the traditional healthcare system, namely, their healthcare provider(2). Research suggests that many adults tend to consult the internet first before visiting a doctor(3,4). Several reasons for this have been identified, including lack of time during healthcare visits and the perception that the information provided during visits is insufficient or unhelpful(3).

This widespread adoption of OHIS presents both opportunities and challenges. While OHIS offers the potential to empower individuals to take a more active role in managing their health(5), there are also numerous concerns. The most commonly cited concern is the quality of online health information(3,6,7). This has been well-studied, with research suggesting that it is common for information to be: inaccurate, misleading, or out-of-date, and the credibility of sources can be difficult for users to assess(1,8). Less research has focused on the cultural appropriateness of online health information, despite some of the most well-known OHIS worldwide being developed by health authorities and private institutions in Western societies, including sources such as WebMD(9,10), Mayo Clinic Connect(11–13), and the NHS Online(14) (15,16). This means that in addition to judging the overall quality of medical information, it is possible that global populations may have to do further work to satisfy their information needs.

This study seeks to fill this gap by investigating the experiences and perceptions of a diverse group of people with Nigerian heritage residing in various countries around the world regarding their use of online health information sources (OHIS). The study examines the frequency and nature of OHIS usage, the trust placed on different platforms and the perceived reliability of the sources. By focusing on a specific cultural group with a global presence, the research aims to shed light on the global relevance of OHIS and the potential impact of cultural background on information-seeking behaviors and trust.

This research explores the following key questions:
- How frequently and for what purposes do Nigerians residing in various countries utilize OHIS?
- What factors influence trust and reliability in different OHIS?
- To what extent does cultural relevance play a role in perceptions of information credibility?

The findings contribute to the ongoing dialogue on the global relevance and cultural suitability of OHIS(1,17). By examining the experiences of Nigerians across diverse geographic locations, the study offers insights into the need for inclusive and culturally sensitive OHIS development to maximize their effectiveness for a global audience.

Survey responses from the UK to Nigeria, and across to the US and Canada reveal widespread and varying use of OHIS, from daily searches to occasional lookups with participants seeking information on a variety of health topics. Sources such as Google, WebMD, and the NHS website were commonly cited as trusted sources of health information, while participants expressed hesitance to trust information from conversational AI models. Participants trusted OHIS that they were familiar with and from known health authorities regardless of whether it was locally and culturally

relevant. However, we also found that some participants found OHIS content to be too general and not tailored to their specific needs. The findings suggest that to achieve a truly global impact, OHIS must be more inclusive and cater to diverse cultural contexts(18–21). This includes developing reliable OHIS tailored to specific needs, such as mental health apps designed for Black and Latinx communities (for example., Sista Afya(22) and Alkeme(23)).

Methods
We conducted a qualitative study(24) using an online survey instrument to explore the experiences and perceptions of diverse individuals from Nigerian backgrounds living in multiple countries regarding online health information sources (OHIS). This was an ideal method for a preliminary exploration of this topic that provides rich data, enables input from geographically diverse participants (i.e., asynchronous), and offers preliminary insights that can be further investigated in follow-up studies.(28). It also ensured convenience, accessibility and flexibility for respondents based in different countries across the world.

Survey Instrument. We developed an online survey instrument following the example of previous studiers(25–27) to gather in-depth information from a diverse sample of participants across various countries. The survey was designed to gather in-depth information and consisted of 12 open-ended questions, which enabled the respondents to express themselves freely, without being limited by predefined response options. The questions covered the following key topics: patterns of seeking health information, trusted sources of online health information, factors influencing decisions to use online health information, use of generative AI tools such as ChatGPT for seeking health information, comparison of information from online versus healthcare providers, whether respondents value sources of online health information, the interplay of healthcare services and online health information seeking, and outcomes of using online health information.

Participant Selection and Recruitment. We used purposive sampling(29–31) to selectively recruit diverse participants. The criteria for selecting the participants were: (a) access to digital devices and the internet, (b) they lived in countries with different types of healthcare systems, ranging from universal to private, (c) the countries were a mix of both developed and undeveloped countries for a global response, and (d) they were willing and available to take part in the study. We contacted the potential participants through a social media platform frequented by Nigerians living in Nigeria and abroad and invited them to participate in the study. They were informed of the purpose, procedures, and ethical considerations of the study, and asked to consent before completing the survey questionnaire. The survey was developed and deployed using Google Forms. We ensured confidentiality and anonymity of their responses by not requesting any personal or intrusive information from them. The data collection took place over a period of three weeks. Our institutional review board deemed this study exempt.

Data Analysis. We performed an inductive qualitative content analysis(32) on the survey responses focused on answering our research questions. Two researchers independently reviewed participant responses across questions and developed a codebook. We then met to discuss our codebooks, reconcile differences, and determine a final codebook. One author used the final codebook to code the data.

Results
A total of 31 Nigerians (12 male, 19 female) completed the online survey. Table 1 presents a summary of the demographics of participants by country. Participants resided in seven different countries: United States (7), United Kingdom (5), Canada (2), Nigeria (14), Malaysia (1), Bulgaria (1), and Australia (1). The mean age of the participants was 35 years old (range: 21-65 years). Most of our participants had a bachelor's degree or higher, suggesting a highly educated sample.

Healthcare systems around the world can be broadly categorized into three main types: public, private, and mixed(33). Public healthcare systems are funded primarily by the government through taxes. These systems aim to provide universal healthcare coverage to all citizens, regardless of their income or employment status(34,35). Private healthcare systems rely primarily on private funding, such as private health insurance or direct patient payment. Individuals have more choice over their doctors and hospitals, often with more flexibility in treatment options(33,34,36) while mixed healthcare systems combine elements of both public and private financing and delivery. The specific mix varies from country to country(37,38). The healthcare systems in about half of these countries in which our participants reside are public, about half are a mix of public and private, and one is private.

Table 1. Healthcare context and select demographics of participants by country.

	Healthcare System	Total	% Female (n)	% ≥45 years (n)	% ≥Bachelor's Degree (n)

Australia	Public/Private	1	100% (1)	100% (1)	100% (1)
Bulgaria	Public	1	0% (0)	100% (1)	100% (1)
Canada	Public	2	50% (1)	100% (2)	100% (2)
Malaysia	Public/Private	1	100% (1)	0% (0)	100% (1)
Nigeria	Public/Private	14	42.9% (6)	35.72% (5)	64.29% (9)
United Kingdom (UK)	Public	5	100% (5)	0% (3)	100% (5)
United States (US)	Private	7	71.4% (5)	71.4% (5)	100% (7)
Total		**31**	**66.3% (19)**	**58.2% (17)**	**94.9% (22)**

Our study captures the global use of OHIS among populations of Nigerian heritage. The data analysis provided insights into how this population accesses and perceives online health information sources. Our results revealed distinct patterns in the global use of OHIS in this population. We present our findings along the three high-level categories identified through our analysis: usage patterns and frequency of online health information seeking, global vs. local resources, risk perceptions and self-diagnosis, and influence of healthcare access and comparison with healthcare professionals.

Usage Patterns and Frequency. All but one respondent reports having used OHIS to some extent, with 48.4% seeking health information online often (e.g., *"always"*, *"daily"*) and 38.7% seeking health information online occasionally (e.g., *"only when there's a need"*). Table 2 summarizes frequency of online health information seeking by country. At least 40% of participants from each country reported using online health information often, with the exception of the participant from Bulgaria who reported occasional online health information use.

Table 2. Frequency of online health information use overall and by country.

Frequency	Total	Often	Occasionally	Rarely	Never
Australia	1	1	0	0	0
Bulgaria	1	0	1	0	0
Canada	2	1	1	0	0
Malaysia	1	1	0	0	0
Nigeria	14	6	6	1	1
United Kingdom (UK)	5	3	1	1	0
United States (US)	7	3	3	1	0
Total	**31**	**48.4% (15)**	**38.7% (12)**	**9.7% (3)**	**3.2% (1)**

We found that participants across contexts were seeking online health information throughout the medical care trajectory(39) – from prevention through treatment – especially in contexts where access to the traditional healthcare system was limited (e.g., long wait times, geographically isolated). The most common reasons for seeking online information include:

- General health inquiries
- Symptom-related research
- Weight management information
- Nutrition guidance

While a minority reported that they have self-diagnosed and treated themselves based on online information, the prevalent approach was to use online information as a first step before consulting a healthcare professional. Most survey respondents highlighted the importance of consulting with a doctor for proper diagnosis and treatment.
Global vs. Local Sources and Credibility. Our findings reveal significant variations in trust towards Online Health Information Sources (OHIS) among participants. Government health websites, such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), along with established medical institutions like NHS Online and the Mayo Clinic, were generally perceived as the most reliable and credible sources. This trust is largely attributed to their established reputation and strong affiliation with medical expertise. For instance, a US-based respondent noted, *"I trust online information from a health perspective from organizations like the CDC and the New York State Health Department"* Medical guidelines (e.g., GP Notebook, FP Notebook, NICE guidelines) and general

search engines (e.g., Google) were less frequently cited but still regarded as trustworthy. A respondent from Nigeria, for example, stated, *"I use Google because it is the biggest search engine and easily accessible"*. Online encyclopedias, including WebMD and Wikipedia, were also mentioned as credible, though less prominently. In contrast, AI assistants were consistently met with skepticism. Concerns centered on their perceived immaturity, lack of medical expertise, and potential for disseminating misinformation. This sentiment was captured by a Malaysia-based respondent who preferred "Health Organization websites over and above AI assistants." Table 3 provides a summary of the OHIS preferences among our participants and the reasons for their trust.

Table 3 summarizes our results on OHIS used by our participants and reasons for trust.

Risk Perceptions and Self-Diagnosis. A cautious approach to self-diagnosis and treatment was evident, with participants emphasizing the importance of professional medical advice for serious conditions. While a few respondents used online information for self-diagnosis or treatment of minor issues, many acknowledge limitations and potential dangers, most participants were cautious about self-diagnosis based solely on online information. Several participants highlight the role of online information as a first step to gather information before consulting a doctor. However, some used it after consulting with a doctor as a starting point for further investigation or a second opinion.

Table 3. Participants Preferred OHIS Source

Country of residence	No. of Respondents	Preferred Online Health Information Source	Reason for trust
Australia	1	WebMD, the Mayo Clinic Online, Cedars Sinai, John Hopkins, and government websites (U.S, U.K., and Australia).	
Bulgaria	1	NHS Online or WebMD	Data is more accurate.
Canada	2	Information from recommended sites and clinics.	Information is more accurate as they treat patients with these symptoms.
Malaysia	1	Health Organization websites.	Content curated by registered health professionals attracts trust.
Nigeria	14	Google, WHO, Research and Institutional sources, Mayo Clinic, WebMD, Google, websites of health journals or medical professionals.	• Trust in known and trained health professionals and institutions because: - Other sites are just for online views and engagement, - they have a legal obligation to provide health facts and credible data and information. - they are experienced and professional. - they share research /studies that back their recommendations. • These sources have been around for a while. • Google is the biggest search engine.
UK	5	GP notebook, FP notebook NICE guidelines, NHS online, WebMD	NHS Online is owned by the UKs health authority, The NHS, and it is not funded by third parties

USA	7	The Mayo Clinic Connect, Wikipedia, CDC, New York State Health Department, WebMD	It is a reliable source of information, Wikipedia in general as it has proven to be reliable on a wide variety of topics and rely on websites of service providers.

The study also revealed varied perceptions of risks associated with using OHIS among participants. While some participants acknowledged using online information for self-diagnosis or treatment of minor ailments, many recognized the limitations and potential dangers associated with this practice(28). Most participants expressed wariness about relying solely on online information, particularly from AI assistants like ChatGPT and Gemini, for self-diagnosis of serious health conditions. Others viewed online resources as a tool for further investigation or a second opinion. The findings also suggest a varied perception of risk based on the severity of the health concern. Participants who had not experienced negative consequences from using online health information or AI-powered language models tended to view these resources as educational tools. They reported using online information to enhance their health awareness and inform their healthcare decisions, but not as a substitute for professional medical advice for serious conditions. On the other hand, On the other hand, one participant recounted negative experiences, such as self-medicating based on online information, which resulted in adverse health outcomes. These experiences highlight a higher perceived risk associated with relying on online health information for serious health issues without consulting healthcare professionals(28) and highlights the importance of consulting healthcare professionals(42).

Influence of Access to Healthcare and Comparison with Healthcare Professionals. Our study revealed a trend between access to healthcare and reliance on OHIS. Participants based in countries with limited access to healthcare professionals, such as Nigeria, reported using online resources more frequently. While participants from countries with well-established healthcare systems, like the UK's NHS, tended to use online resources for supplementary information or to address wait times for appointments.

The study identified disparities in access to healthcare and affordability across the participant pool. Participants from Nigeria and some other countries highlighted challenges in accessing healthcare professionals, they had varying experiences regarding healthcare service quality and affordability. Some had access to affordable and reliable healthcare, while others faced challenges with cost or limited service availability. The UK's NHS was praised by several UK based respondents for its quality, while Nigeria based respondents mentioned the healthcare system as providing primary, secondary, and tertiary services but affordability and accessibility of healthcare services were concerns. The study also confirmed issues with the healthcare services in the Nigeria and USA about affordability and poor health insurance coverage. Similarly, timely access to care was identified as a concern among participants in the UK, US, Nigeria, and Bulgaria making online resources a more crucial source of information. These findings emphasize the potential of OHIS to bridge gaps in healthcare access in underserved areas.

The findings also reveal that the availability and quality of healthcare services does not substantially influence the use of online health information sources for most respondents. For instance, a UK based doctor reported daily use of online health resources, while a Nigeria based engineer cited cost and quicker access as primary reasons for turning to online resources.

Participants expressed varying perceptions regarding the accuracy of online health information. While some found online resources detailed and informative, others expressed concerns about potential bias, misinformation, and the risk of self-misdiagnosis(42,43). The importance of consulting healthcare professionals for definitive diagnoses and treatment plans was consistently emphasized.

Our findings further demonstrate that healthcare professionals remain the primary source of trusted information and treatment for most participants. Participants consistently reported relying on healthcare professionals for definitive diagnoses and treatment plans. While healthcare professionals seem to hold the highest position of trust, they valued OHIS for additional insights, or expedited initial guidance. Participants valued OHIS for several reasons:

- Accessibility and convenience: Online resources offer convenient 24/7 access to health information, allowing participants to obtain information at their own pace.

- Broader range of information and perspectives: OHIS can provide a wider range of information and perspectives on health topics compared to a single healthcare professional consultation.
- Informed decision-making and second opinions: Online resources can empower participants to make more informed decisions about their health and potentially seek second opinions.

While OHIS offer convenience and accessibility, participant experiences varied. Some found online information to be more detailed than a doctor's advice, while others considered healthcare professionals as the gold standard for medical advice. One respondent noted, *"Health professionals' access to diagnostic tools and expertise provides a more comprehensive picture of a patient's health."*

In conclusion, the study shows that at the moment, healthcare professionals still remain the cornerstone of trust for health information. However, OHIS play a valuable complementary role offering convenient access to information, broader perspectives, and the potential to empower patients in making informed healthcare decisions, especially for participants in regions with limited access to healthcare professionals (e.g., Nigeria) and where there tends to be a higher out-of-pocket cost for healthcare (e.g. USA). However, notably, regardless of the country that participants resided in, they tended to trust OHIS that are largely developed for and tailored to Western countries.

Discussion

This study explored how Nigerians from diverse backgrounds living across the world use and perceive online health information sources (OHIS). The findings reveal a global reliance on online health resources among Nigerians, with participants living in various countries (USA, UK, Nigeria, Australia, Canada, Bulgaria, and Malaysia) reporting using them to search for health information.

A notable theme emerging from the data is the variation in trust towards OHIS. Participants placed a higher degree of trust in professional diagnosis and established health websites like NHS or Mayo Clinic compared to unofficial sources or AI assistants. This preference stemmed from source reputation[44], information accuracy and verifiability, convenience, the ease of obtaining information, the speed at which it can be accessed, and the ability to compare information. Interestingly, WebMD, though frequently used, also raised some concerns about accuracy among participants. Participants based in Nigeria, where access to healthcare might be limited, exhibited a clearer preference for established sources like international government health websites (NHS, CDC), reputable institutions (Mayo Clinic), and professional organizations.

Comparison to previous research. Many of our results align with previous research. For example, Wu et al (2024)[51] that highlighted the potential of OHIS to inform patients and supplement professional medical advice. Our study participants echoed this sentiment, with some reporting that OHIS provided more in-depth information than traditional consultations. This perceived advantage might be particularly relevant in situations with limited consultation time, affordability concerns, or gaps in healthcare access.

This research complements studies on health information-seeking behaviors among Saudis and U.S. residents[4,52] light on the determinants of source preference and the consequent implications for healthcare providers. Our investigation uniquely captures the narratives of Nigerians globally, examining their interactions with Online Health Information Systems (OHIS) and the impact of their geographical location and local healthcare infrastructure on these interactions. It underscores the imperative for culturally adaptive OHIS content to facilitate universal access to health information. In contrast to the broader empirical insights provided by the aforementioned studies, our case study zeroes in on the cultural nuances influencing OHIS engagement among Nigerians, offering a focused cultural lens on the subject matter.

Reliance on global resources. While popular platforms like WebMD, The Mayo Clinic Connect, NHS Online, Google, and Wikipedia are frequently and widely used, there was a tendency among some participants to prefer local sources, such as the NHS Online in the UK and the CDC in the US. Participants residing in all countries except Malaysia and Canada use WebMD. USA and UK based participants deferred to the official health sites of these countries before using other health sources. USA based residents only used US online health sources as opposed to Nigeria based participants that do not report using any Nigerian or African specific online health information sources which suggest that using well-known and trusted global OHIS may be more important than having resources that are culturally tailored with locally relevant information (e.g., medications available in a given country). Alternatively, there may not be a reliable Nigerian, or even African-specific, OHIS.

Ultimately, it is critical that the most relevant information for minoritized populations is reaching them so that they have the information they need to make decisions such as when to seek medical care, as well as to advocate for themselves when receiving healthcare. For example, there has been widely reported issues with medical guidelines not having treatments targeted at ethnic minority people like the recent case with uterine cancer treatment that did not work for black and Hispanic populations(48–50). There are also ailments that are common in Nigeria, such as Malaria, that may not have a full complement of treatments available in US/UK-originated OHIS(45–47).

Limitations. This study provided valuable insights into the experiences and perceptions of Nigerians regarding online health information sources (OHIS); however, there are several limitations that should be acknowledged, including the limited number of participants, potentially restricting the generalizability of the findings and the study focused solely on Nigerians. Future research should continue to explore how to best meet different underserved populations' needs for trustworthy online health information, including exploring perceptions of both commonly used OHIS and more culturally tailored but perhaps less known OHIS. Finally, cultural contexts and experiences related to OHIS use might differ markedly for other populations and in other countries. However, it lays the groundwork for future research in creating culturally sensitive OHIS that are locally relevant and that can positively impact health outcomes worldwide.

Conclusions
Overall, this study has shed light on the extensive global reach of OHIS and the diverse ways Nigerians living in different countries engage with these platforms. The findings reinforce the primary role of healthcare professionals, however, OHIS have emerged as a valuable complementary tool for acquiring additional information, facilitating informed decision-making, and potentially improving access to health guidance in regions with limited healthcare services. Nonetheless, it is essential to address issues of information quality, cultural relevance, and promote critical evaluation skills to ensure safe and responsible use of OHIS.

Considering the global reach of OHIS and the disparities in healthcare access across the world, culturally tailored OHIS will be a powerful tool for empowering individuals towards safe self-management and achieving improved health outcomes on a global scale.

References
1. Eysenbach G, Powell J, Kuss O, Sa ER. Empirical studies assessing the quality of health information for consumers on the world wide web: a systematic review. JAMA. 2002 May 22;287(20):2691–700.
2. Fox S. What ails America? Dr. Google can tell you [Internet]. Pew Research Center. 2013 [cited 2024 Aug 12]. Available from: https://www.pewresearch.org/short-reads/2013/12/17/what-ails-america-dr-google-can-tell-you/
3. Clark O, Reynolds TL, Ugwuabonyi EC, Joshi KP. Exploring the Impact of Increased Health Information Accessibility in Cyberspace on Trust and Self-care Practices. In: Proceedings of the 2024 ACM Workshop on Secure and Trustworthy Cyber-Physical Systems [Internet]. New York, NY, USA: Association for Computing Machinery; 2024 [cited 2024 Aug 12]. p. 61–70. (SaT-CPS '24). Available from: https://dl.acm.org/doi/10.1145/3643650.3658611
4. Swoboda CM, Van Hulle JM, McAlearney AS, Huerta TR. Odds of talking to healthcare providers as the initial source of healthcare information: updated cross-sectional results from the Health Information National Trends Survey (HINTS). BMC Fam Pract. 2018 Aug 29;19(1):146.
5. Samal L, Saha S, Chander G, Korthuis PT, Sharma RK, Sharp V, et al. Internet Health Information Seeking Behavior and Antiretroviral Adherence in Persons Living with HIV/AIDS. AIDS Patient Care STDs. 2011 Jul;25(7):445–9.
6. Silver MP. Patient Perspectives on Online Health Information and Communication With Doctors: A Qualitative Study of Patients 50 Years Old and Over. J Med Internet Res. 2015 Jan 13;17(1):e3588.
7. Sun Y, Zhang Y, Gwizdka J, Trace CB. Consumer Evaluation of the Quality of Online Health Information: Systematic Literature Review of Relevant Criteria and Indicators. J Med Internet Res. 2019 May 2;21(5):e12522.
8. Li Y, Fan Z, Yuan X, Zhang X. Recognizing fake information through a developed feature scheme: A user study of health misinformation on social media in China. Inf Process Manag. 2022 Jan 1;59(1):102769.
9. Hautala GS, Comadoll SM, Raffetto ML, Ducas GW, Jacobs CA, Aneja A, et al. Most orthopaedic trauma patients are using the internet, but do you know where they're going? Injury. 2021 Nov 1;52(11):3299–303.
10. Haaren TMR van. Can the WebMD self-diagnosis tool be used to affect care-seeking behavior related to visiting a general practitioner? : Using self-diagnosis to reduce unnecessary visitations to general practitioners with the

goal of making more efficient usage of available resources. [Internet]. University of Twente; 2022 [cited 2024 Aug 13]. Available from: https://essay.utwente.nl/92836/

11. Kotsenas AL, Aase L, Arce M, Timimi FK, Dacy M, Young C, et al. The Social Media DNA of Mayo Clinic—and Health Care. J Am Coll Radiol. 2018 Jan 1;15(1, Part B):162–6.

12. Ryu AJ, Magnuson DR, Kingsley TC. Why Mayo Clinic Is Embracing the Cloud and What This Means for Clinicians and Researchers. Mayo Clin Proc Innov Qual Outcomes. 2021 Dec 1;5(6):969–73.

13. Herzlinger RE, Huckman RS, Lesser J. Mayo clinic: The 2020 initiative. Harv Bus Sch [Internet]. 2014 [cited 2024 Aug 13]; Available from: https://www.heller.brandeis.edu/executive-education/maine-2023-2024/readingsession5/mayo-clinic.pdf

14. Williams P, Nicholas D, Huntington P. Health information on the Internet: a qualitative study of NHS Direct Online users. Aslib Proc. 2003 Jan 1;55(5/6):304–12.

15. Shaw S, Wherton J, Vijayaraghavan S, Morris J, Bhattacharya S, Hanson P, et al. Advantages and limitations of virtual online consultations in a NHS acute trust: the VOCAL mixed-methods study. Health Serv Deliv Res [Internet]. 2018 [cited 2024 Aug 13];6(21). Available from: https://ora.ox.ac.uk/objects/uuid:c6b9a715-cffc-4cbd-a30b-1a883410384d/files/md8350beed9aa9bca23f0a27736b3b297

16. Turnbull J, MacLellan J, Churruca K, Ellis LA, Prichard J, Browne D, et al. Is there evidence for differential access to, and use of, NHS 111 online? In: A multimethod study of NHS 111 online [Internet]. National Institute for Health and Care Research; 2023 [cited 2024 Aug 13]. Available from: https://www.ncbi.nlm.nih.gov/books/NBK593433/

17. Gopalkrishnan N. Culture, Diversity, and Global Health: Challenges and Opportunities. In: Kickbusch I, Ganten D, Moeti M, editors. Handbook of Global Health [Internet]. Cham: Springer International Publishing; 2021 [cited 2024 Aug 12]. p. 103–35. Available from: https://doi.org/10.1007/978-3-030-45009-0_5

18. Birati Y, Yefet E, Perlitz Y, Shehadeh N, Spitzer S. Cultural and Digital Health Literacy Appropriateness of App- and Web-Based Systems Designed for Pregnant Women With Gestational Diabetes Mellitus: Scoping Review. J Med Internet Res. 2022 Oct 14;24(10):e37844.

19. Rice ZS, Liamputtong P. Cultural Determinants of Health, Cross-Cultural Research and Global Public Health. In: Liamputtong P, editor. Handbook of Social Sciences and Global Public Health [Internet]. Cham: Springer International Publishing; 2023 [cited 2024 Aug 12]. p. 689–702. Available from: https://doi.org/10.1007/978-3-031-25110-8_44

20. Spector RE. Cultural Diversity in Health and Illness. J Transcult Nurs. 2002 Jul 1;13(3):197–9.

21. Joo JY, Liu MF. Culturally tailored interventions for ethnic minorities: A scoping review. Nurs Open. 2021 Sep;8(5):2078–90.

22. Sista Afya [Internet]. [cited 2024 Aug 13]. Sista Afya Community Mental Wellness | Chicago, IL. Available from: https://www.sistaafya.com

23. Alkeme [Internet]. [cited 2024 Aug 13]. The Gold Mind. Available from: https://alkemehealth.com/journal

24. Strauss A autor/a. Basics of qualitative research grounded theory procedures and techniques. Newbury Park, California Sage; 1990.

25. Imlach F, McKinlay E, Middleton L, Kennedy J, Pledger M, Russell L, et al. Telehealth consultations in general practice during a pandemic lockdown: survey and interviews on patient experiences and preferences. BMC Fam Pract. 2020 Dec 13;21(1):269.

26. Smith SJ, Smith AB, Kennett W, Vinod SK. Exploring cancer patients', caregivers', and clinicians' utilisation and experiences of telehealth services during COVID-19: A qualitative study. Patient Educ Couns. 2022 Oct 1;105(10):3134–42.

27. Juan NVS, Aceituno D, Djellouli N, Sumray K, Regenold N, Syversen A, et al. Mental health and well-being of healthcare workers during the COVID-19 pandemic in the UK: contrasting guidelines with experiences in practice. BJPsych Open. 2021 Jan;7(1):e15.

28. Eysenbach G, Wyatt J. Using the Internet for Surveys and Health Research. J Med Internet Res. 2002 Nov 22;4(2):e862.

29. Purposive sampling: complex or simple? Research case examples - Steve Campbell, Melanie Greenwood, Sarah Prior, Toniele Shearer, Kerrie Walkem, Sarah Young, Danielle Bywaters, Kim Walker, 2020 [Internet]. [cited 2024 Aug 13]. Available from: https://journals.sagepub.com/doi/full/10.1177/1744987120927206?casa_token=X11J0f_1vVwAAAAA%3AqCvJ4_aXRe34j4zKKarkowuN_BHz5wdDquOSkxmWL_IqFaRN9jCSIWEhAtCaHta8JQ9kG-qS8omIBdc

30. Nyimbili F, Nyimbili L. Types of Purposive Sampling Techniques with Their Examples and Application in Qualitative Research Studies. Br J Multidiscip Adv Stud. 2024 Feb 16;5(1):90–9.

31. Oppong SH. The problem of sampling in qualitative research. Asian J Manag Sci Educ. 2013;2(2):202–10.

32. Mayring P. Qualitative Content Analysis. Forum Qual Sozialforschung Forum Qual Soc Res -Line J Httpqualitative-Res-E2-00inhalt-Ehtm. 2000 Jun 1;1.

33. Reibling N, Ariaans M, Wendt C. Worlds of Healthcare: A Healthcare System Typology of OECD Countries. Health Policy Amst Neth. 2019 Jul;123(7):611–20.

34. Odeyemi I, Nixon J. Assessing equity in health care through the national health insurance schemes of Nigeria and Ghana: a review-based comparative analysis. Int J Equity Health. 2013 Jan 22;12(1):9.

35. Dallago B, Casagrande S. The Routledge handbook of comparative economic systems [Internet]. Routledge 4 Park Square, Milton Park, Abingdon, Oxon OX14 4RN; 2023 [cited 2024 Aug 13]. Available from: https://api.taylorfrancis.com/content/books/mono/download?identifierName=doi&identifierValue=10.4324/978 1003144366&type=googlepdf

36. Ovretveit J. Beyond the public-private debate: the mixed economy of health. Health Policy Amst Neth. 1996 Jan;35(1):75–93.

37. Babar ZUD, Ramzan S, El-Dahiyat F, Tachmazidis I, Adebisi A, Hasan SS. The Availability, Pricing, and Affordability of Essential Diabetes Medicines in 17 Low-, Middle-, and High-Income Countries. Front Pharmacol [Internet]. 2019 Nov 19 [cited 2024 Aug 12];10. Available from: https://www.frontiersin.org/journals/pharmacology/articles/10.3389/fphar.2019.01375/full

38. James BC, Ede SS, Aroh CM, Okoh CF, Kanokwan C, Rasip ML, et al. Attitudes and perceptions of Nigerians regarding receiving COVID-19 vaccines: an online cross-sectional study. Pan Afr Med J [Internet]. 2022 Mar 25 [cited 2024 Aug 12];41(1). Available from: https://www.ajol.info/index.php/pamj/article/view/242713

39. Reynolds TL, Zhang J, Zheng K, Chen Y. Unpacking the Use of Laboratory Test Results in an Online Health Community throughout the Medical Care Trajectory. Proc ACM Hum-Comput Interact. 2022 Nov 11;6(CSCW2):361:1-361:32.

40. Mohamed F, Shoufan A. Users' experience with health-related content on YouTube: an exploratory study. BMC Public Health. 2024 Jan 3;24(1):86.

41. Fiksdal AS, Kumbamu A, Jadhav AS, Cocos C, Nelsen LA, Pathak J, et al. Evaluating the Process of Online Health Information Searching: A Qualitative Approach to Exploring Consumer Perspectives. J Med Internet Res. 2014 Oct 7;16(10):e3341.

42. Božić V. Digital Health and Communication - A Revolution with Cautions. Int J Digit Health Patient Care. 2024 Jun 30;1(1):38–49.

43. Kwan G, Shaw JA, Murnane L. Internet Usage within Healthcare: How College Students Use the Internet to Obtain Health Information. J Consum Health Internet. 2019 Oct 2;23(4):366–77.

44. Pooja K, Upadhyaya P. What makes an online review credible? A systematic review of the literature and future research directions. Manag Rev Q. 2024 Jun 1;74(2):627–59.

45. Linares-Rufo M, Bermudez-Marval H, García-Bertolín C, Santos-Galilea J, Balsa-Vázquez J, Pérez-Tanoira R, et al. Perspectives of primary care physicians in Spain on malaria: a cross-sectional survey and retrospective review of cases. Malar J. 2024 Jan 4;23(1):7.

46. Bird C, Hayward GN, Turner PJ, Wasala D, Merrick V, Lyttle MD, et al. Infections diagnosed in children and young people screened for malaria in UK emergency departments: a retrospective multi-centre study. Paediatr Int Child Health. 2024 Jan 2;44(1):1–7.

47. Gawthrop M. Prescribing anti-malarials in the UK. J Prescr Pract. 2023 May 2;5(5):204–9.

48. Journal BA/ P by NCW for TWS. WSJ. 2024 [cited 2024 Aug 13]. Uterine Cancer Was Easy to Treat. Now It's Killing More Women Than Ever. Available from: https://www.wsj.com/health/healthcare/uterine-endometrial-cancer-symptoms-survival-4d1241a3

49. Seay K, Katcher A, Hare M, Rahman H, Sison C, Goldberg GL, et al. Racial disparities in the treatment of endometrial intraepithelial neoplasia in postmenopausal women. Gynecol Oncol Rep. 2024 May 26;54:101418.

50. New Insights Into a Deadly Disparity | Memorial Sloan Kettering Cancer Center [Internet]. 2024 [cited 2024 Aug 13]. Available from: https://www.mskcc.org/news/new-insights-into-deadly-disparity

51. Wu B, Liu QB, Guo X, Yang C. Investigating patients' adoption of online medical advice. Decis Support Syst. 2024 Jan 1;176:114050.

52. Alduraywish SA, Altamimi LA, Aldhuwayhi RA, AlZamil LR, Alzeghayer LY, Alsaleh FS, et al. Sources of Health Information and Their Impacts on Medical Knowledge Perception Among the Saudi Arabian Population: Cross-Sectional Study. J Med Internet Res. 2020 Mar 19;22(3):e14414.