TELEHEALTH AND MEDICINE TODAY

OPINION/PERSPECTIVES/COMMENTARY

First Do No Harm: The Impact of Telemedicine on Health Disparities

Elizabeth White Baker, PhD

Associate Professor of Information Systems, Virginia Commonwealth University, Richmond, Virginia, USA

Corresponding Author: Elizabeth White Baker, Email: bakerew@vcu.edu

DOI: https://doi.org/10.30953/thmt.v9.493

Keywords: health disparities; physician bias; social determinants of health; telemedicine

Received: March 2, 2024; Accepted: May 21, 2024; Published: June 30, 2024

Two driving factors in the advancement of medical care today focus on the rapid adoption of technologies into patient care and the social determinants of health (SDOH) to improve patient outcomes. The increasing use of artificial intelligence (AI), network technologies, mobile devices, and embedded sensors (among many others) to develop and deliver patient care is driving the revolution forward in one area. Another area focuses on nonmedical factors that influence health outcomes, known as SDOH. These SDOHs contribute to wide health disparities and inequities. One of the primary aims of introducing technology to clinical practice has been to narrow health disparities by expanding healthcare access through telemedicine.

One lasting impact of COVID-19 compelling healthcare providers to adopt telemedicine is that remote patient care has become normalized as a channel for patient evaluation and treatment.[1] Even as the virus moves from pandemic to endemic status, telemedicine is viewed as a way to see patients more cost-effectively and reach patients who might have had difficulty accessing healthcare in the past.[2] Specifically, among patients in need of chronic care, telemedicine can significantly reduce the number of outpatient visits. In addition, the increase in preventative procedures for patients with chronic diseases after telemedicine suggests that this population benefits from telemedicine through improved disease management, preventative and follow-up care, and avoidance of costly emergency department or inpatient services.[3]

Telemedicine and Health Equity

Whether telemedicine will be a powerful tool for addressing health disparities remains to be determined.[4] Throughout healthcare, significant work attests to bias in healthcare delivery. For example, Black patients are less likely to be selected for transplants, survive cardiac events, or receive high-cost life-saving procedures.[5–7] leading to significant health disparities. Bringing technology to patients to empower them in managing their care is championed as a driver in reducing these disparities. Yet, before the COVID-19 pandemic, telemedicine utilization rates were so low (4% of survey participants, $N = 2{,}555$) that conclusions could not be drawn on the capability of telemedicine to narrow the gap for those whose healthcare has traditionally been underserved. Fischer et al.[8] discuss this social usage of telemedicine before the pandemic, where 49% of respondents were interested in using telemedicine. At the same time, those who were Black, older, or reported lower levels of education expressed less willingness to use telemedicine. These findings suggest that targeted efforts to address awareness, integration of primary care, and ease of use may be necessary to ensure equitable access to these technological tools.

Health Inequity and the Digital Divide

It is widely thought that telemedicine would be an essential technological tool in addressing healthcare disparities for those who have been traditionally underserved. The challenges that underpin these disparities can be geographical, financial, social, or technological and often consist of a combination of these factors.[9] The pandemic, which forced the adoption of telemedicine on a global scale, brought many insights into what telemedicine does and does not do in addressing these healthcare disparities. As localities worked hard to provide broadband access to more people who could not be connected previously, researchers recognized that having access to the Internet was only one piece of the puzzle in narrowing health disparities.

Hwang et al.[9] found that telemedicine consultations are less likely as the distance between the patient and physician grows. It is not the distance per se that is the problem;

it is that more isolated populations have limited access to high-speed Internet (a technological challenge), and rural healthcare consumers tend to have greater financial constraints compared with similar populations in urban areas. McCullough et al.[10] focused on the populations that were typically left out of healthcare and found that when offered telemedicine as a tool to overcome the barriers that served to prevent access to care, these underserved populations (women, children, and ethnic minorities, among others) did not use the technology. Black patients were more than four times more likely than White Americans to seek healthcare in the emergency department over telemedicine services.[11] This raises the concern that telemedicine could exacerbate existing healthcare disparities without further interventions to promote adoption among these groups.[12,13]

Inequity Is Not Only the Digital Divide

However, an even more significant concern than simply access to telemedicine and spanning the digital divide is whether telemedicine can span the disparities of care among the underserved. Indeed, telemedicine facilitates access and seeking care but can it help those visits lead to better health outcomes for these patients? More research is needed to investigate how telemedicine might impact non-technologically based health inequity factors, such as physician bias and patient distrust.

Telemedicine's Impact on Existing Factors in Health Inequity

Physician bias toward patients of color and the lack of trust that those patients have in physicians is a longstanding health disparity that existed long before the advent of telemedicine. Johnson et al.[14] found in a study on patient race/ethnicity and quality of patient-physician communication during medical visits that physicians were 23% more verbally dominant and engaged in 33% less patient-centered communication with African-American patients than with White patients. Additionally, both African-American patients and their physicians exhibited lower levels of positive affect compared with White patients and their physicians. The disintermediation of communication in telemedicine (and indeed, with all electronic communications) weakens trust between the patient and physician, meaning this lack of trust will likely undermine telemedicine's potential to mitigate health disparities.[12]

Further research points to factors beyond a patient's behaviors that may be the primary source of differential outcomes. Peek et al.[15] found that self-reported racial/ethnic discrimination in healthcare was associated with worse diabetes care and more diabetes complications but not self-care behaviors. For each quality of care measure for diabetes (diabetes-related primary care visits, A1c testing, foot exams, eye exams), at least 25% of respondents reported not receiving appropriate care on that measure, and those who reported experiencing discrimination had lower rates in each of the measures except one (foot exams). These findings highlight the impact of systemic racial and ethnic bias at the root of healthcare disparities.

These biases in patient care persisted during the pandemic. A cohort study in a large healthcare system in New York City found that Black patients with lower than mean income for their ZIP Code and higher than average household size were less likely to use telemedicine to seek care. The multilevel nature of the observed disparities indicates that interventions aimed solely at telemedicine tools and access to them are insufficient to overcome these health disparities. Overall, an understanding of particular subgroups for whom telemedicine uptake is limited is essential to address physician racist and ageist bias at the root of both in-person and telemedicine care disparities.[13,16]

Does Telemedicine Improve or Worsen Physician Bias?

Further research must be done to determine whether telemedicine reinforces or reduces the existing health bias in treatment and outcomes. Mixed results have been found when applying technology generally to the patient-physician treatment relationship. When technology is used as a communication conduit, we would expect any bias, as it is face to face, to be perhaps more pronounced due to the disintermediation of communication telemedicine brings about. Yet, Ganju et al.[17] showed that introducing clinical decision support systems can also offset the bias leading to disparities. For treatment decisions for patients with peripheral arterial disease, incorporating clinical decision support systems into the diagnostic process decreased the amputation rate for Black patients with diabetes in half while having no accompanying change in White patients, thus narrowing the treatment gap due to racial bias among patients in treatment decisions. The technology does not aim to change the physician's mental model towards patients of minority status; instead, it seeks to alter the process to ensure the correct tests are ordered.[17]

Studies currently being conducted investigate whether telemedicine reinforces or reduces racial bias in treatment. Knowing this will help pinpoint a specific intervention that will effectively reduce this bias rather than simply assuming that telemedicine access is sufficient to overcome the bias. Patients diagnosed with chronic diabetes were followed over a 5-year period where the impact of telemedicine on A1c, patient non-compliance, and unspecified/other diagnoses were tracked. Preliminary results show that telemedicine exacerbates the racial bias towards Blacks in treatment at both A1c levels. In addition, the number of unspecified/other diagnoses was higher for Blacks, and the impact was more substantial when using telemedicine. This points to the conclusion that telemedicine reinforces physician bias in healthcare rather

Telehealth and Medicine Today © 2024, 9: 493 - https://doi.org/10.30953/thmt.v9.493

than reducing it. The effect of telemedicine on patient non-compliance, where the patient has more explicit agency and autonomy in their treatment plan, is insignificant. While Black patients have a higher non-compliance rate, the gap in patient non-compliance between Blacks and others remains steady between in-person and telemedicine visits, pointing to the conclusion that telemedicine has no impact on a patient's noncompliant behavior.

Future Concerns and a Call to Action

We health technologists must do our best to remove systemic biases when introducing new technologies such as telemedicine. Indeed, it is an ethical imperative that we continue to address bias in healthcare delivery, including further research on whether and how these systemic biases impact telemedicine. More specifically, by looking into the mechanisms underpinning telemedicine that exacerbate these types of bias, we will have greater insight into how to engineer more equitable remote health delivery solutions.

Some potential concerns to research as mechanisms that worsen the bias with telemedicine include depersonalization of relationships and interactions, decontextualized health information, and insufficient physician training and comfort level with telemedicine information systems. Prior research focused on three potential mechanisms underpinning telemedicine that could exacerbate bias. Telemedicine, or any remote communication, disintermediates the messages sent between the actors. In healthcare, this disintermediation entails significant changes in the modes of clinical practice, along with new types of relationships between the three actors involved: providers, patients, and technology. Healthcare delivery becomes more technology-centered and less patient-centered, as the physician is physically distant from the patient, and changing dynamics among the actors might make the bias more pronounced. In addition, telemedicine requires the physician to provide care using decontextualized information. The psychological distance between the physician and the patient and the patient being in a setting unfamiliar to the clinician means that the physician may offer poor care based on this less-than-optimal information or potential misinformation. The increased workload that telemedicine places on the provider with its technological demands can also worsen bias by overloading the physician to the point that the overall quality of care might be compromised. With little cognitive capacity to actively combat bias, physicians fall back on heuristic shortcuts and might inadvertently exhibit even stronger bias. By understanding how these issues impact telemedicine delivery, we can propose and research ways to improve virtual care to address inequities in both access and bias.

We must continue to question and test whether any technology introduced for patient care improves patient outcomes. This editorial outlines how telemedicine was thought to be a fix for better patient outcomes by expanding access to care. While it did treat one specific symptom, this technological intervention did not universally result in better outcomes. Continuing to question the efficacy of these solutions meant that we could determine where the technological intervention fell short and how it could be addressed. In the case of physician bias, this phenomenon exists in the face-to-face setting and telemedicine, so any intervention must be effective across both delivery channels.

Focusing more on the specific social and clinical skills needed to provide care via telemedicine is a critical need in the healthcare community. Providers might see telemedicine as an issue of technical familiarity and skill, and often, they would instead not practice using the channel, even if the economics between the two are equally beneficial. Yet, while no one might prefer to administer care in the bed of an ambulance speeding through traffic to get to a hospital, having this channel available in many instances is critical to better patient outcomes. The same is true of telemedicine. It must be embraced as a care delivery channel and clinician usage optimized for patient outcomes. Several paths can be taken to achieve this, such as using specialized providers certified in telemedicine delivery (similar to online professors) or entire physician practices focused on telemedicine services. We are only limited by our imagination and determination to create an equitable healthcare delivery system for the 21st century.

Funding

No funding was provided for the preparation of this editorial.

Financial and Non-Financial Relationships and Activities

No relevant disclosures. The author is a member of the Editorial Board of this journal.

Contributors

The author is responsible for the conception through the authoring of this editorial.

Data Availability Statement (DAS), Data Sharing, Reproducibility, and Data Repositories

Data used in the writing of this article are published in the public domain.

Application of AI-Generated Text or Related Technology

No AI tools were used in developing this manuscript.

Acknowledgments

None.

References

1. Cohen E, Cohen MI. COVID-19 will forever change the landscape of telemedicine. Curr Opin Cardiol. 2021;36(1):110–5. https://doi.org/10.1097/HCO.0000000000000806
2. Donelan K, Barreto EA, Sossong S, Michael C, Estrada JJ, Cohen AB, et al. Patient and clinician experiences with telehealth for patient follow-up care. Am J Manag Care. 2019;25(1):40–4.
3. Ayabakan S, Bardhan I, Zheng E. Impact of telehealth use on healthcare utilization: A Quasi-experimental study of Maryland Patients. SSRN J. 2020 [cited 2024 Mar 2]; Available from: https://www.ssrn.com/abstract=3707829
4. Pierce RP, Stevermer JJ. Disparities in use of telehealth at the onset of the COVID-19 public health emergency. J Telemed Telecare. 2020;29(1):3–9. https://doi.org/10.1177/1357633X20963893
5. Becker LB, Han BH, Meyer PM, Wright FA, Rhodes KV, Smith DW, et al. Racial differences in the incidence of cardiac arrest and subsequent survival. N Engl J Med. 1993;329(9):600–6. https://doi.org/10.1056/NEJM199308263290902
6. Jha AK, Fisher ES, Li Z, Orav EJ, Epstein AM. Racial trends in the use of major procedures among the elderly. N Engl J Med. 2005;353(7):683–91. https://doi.org/10.1056/NEJMsa050672
7. Rubineau B, Kang Y. Bias in white: a longitudinal natural experiment measuring changes in discrimination. Manage Sci. 2012;58(4):660–77. https://doi.org/10.1287/mnsc.1110.1439
8. Fischer SH, Ray KN, Mehrotra A, Bloom EL, Uscher-Pines L. Prevalence and characteristics of telehealth utilization in the United States. JAMA Netw Open. 2020;3(10):e2022302. https://doi.org/10.1001/jamanetworkopen.2020.22302
9. Hwang EH, Guo X, Tan Y, Dang Y. Delivering healthcare through teleconsultations: implications for offline healthcare disparity. Inform Syst Res. 2022;33(2):515–39. https://doi.org/10.1287/isre.2021.1055
10. McCullough J, Ganju KK, Ellimoottil C. Does telemedicine transcend disparities or create a digital divide? Evidence from the COVID-19 pandemic. SSRN J. 2021 [cited 2024 Mar 2]. Available from: https://www.ssrn.com/abstract=3834445
11. Weber E, Miller SJ, Astha V, Janevic T, Benn E. Characteristics of telehealth users in NYC for COVID-related care during the coronavirus pandemic. J Am Med Inform Assoc. 2020;27(12):1949–54. https://doi.org/10.1093/jamia/ocaa216
12. Yee V, Bajaj SS, Stanford FC. Paradox of telemedicine: building or neglecting trust and equity. Lancet Digital Health. 2022;4(7):e480–1. https://doi.org/10.1016/S2589-7500(22)00100-5
13. Chunara R, Zhao Y, Chen J, Lawrence K, Testa PA, Nov O, et al. Telemedicine and healthcare disparities: a cohort study in a large healthcare system in New York City during COVID-19. J Am Med Inform Assoc. 2021;28(1):33–41. https://doi.org/10.1093/jamia/ocaa217
14. Johnson RL, Roter D, Powe NR, Cooper LA. Patient race/ethnicity and quality of patient–physician communication during medical visits. Am J Public Health. 2004;94(12):2084–90. https://doi.org/10.2105/AJPH.94.12.2084
15. Peek ME, Wagner J, Tang H, Baker DC, Chin MH. Self-reported racial discrimination in health care and diabetes outcomes. Medical Care. 2011;49(7):618–25. https://doi.org/10.1097/MLR.0b013e318215d925
16. Assari S, Lee DB, Nicklett EJ, Moghani Lankarani M, Piette JD, Aikens JE. Racial discrimination in health care is associated with worse glycemic control among Black men but not Black women with type 2 diabetes. Front Public Health. 2017;5:235. https://doi.org/10.3389/fpubh.2017.00235
17. Ganju KK, Atasoy H, McCullough J, Greenwood B. The role of decision support systems in Attenuating racial biases in healthcare delivery. Manage Sci. 2020;66(11):5171–81. https://doi.org/10.1287/mnsc.2020.3698